THREAD TECHNOLOGY
MADE IN GERMANY.
SINCE 1905.

無屑絲攻 CATALOGUE 2.0

NeobOss

»The strength is in the quality.«

Friedrich Nietzsche (German philosopher, 1844–1900)

Neoboss is producing high-quality tools for more than 100 years now.

Our philosophy is simple and convincing: we constantly work on improving the quality of your goods and help to increase the profitability of your production.

Our way: with selected materials from internationally renowned suppliers, our own heat treatment technology, various cutting edge preparations, and our 100 years of experience in product engineering, we are producing tools which are successfully used all over the world. Together with our partners, we offer state-of-the-art coating technologies to provide a reproducible manufacturing process for top level quality.

Our success is our best reference – we serve well-known and demanding international business partners:

- the automotive industry and their subcontractors
- the fastener industry
- the engineering industry
- the aerospace industry
- the mold and die production industry
- the electrical engineering industry

The technological progress, marked by the accelerated development of materials, and the demand for increased productivity, is the motivation in our daily work of research, engineering and production. We are continuously investing to advance our products.

The result: skilled employees are producing millions of innovative tools each year in our factories in Germany and abroad. Established products are improved continuously by Neoboss, for future generations of applications.

New parts are designed based on your individual requirements. Coatings of our tools are constantly updated and added to your product portfolio.

To find out more about our tools and our service please contact us. Our sales experts and our application engineers are happy to assist you.

Neoboss Taps
Catalogue 2.0

IMPRINT

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Orientation Guide

In order to find the best type of tap quickly, please, use the orientation guide below.

3 steps to find the best tool for your application

1. Possibility
Machining 42CrMo 4; 900 N/mm² / material-no. 1.7225 / DIN 371 M6 6H through hole

First Step	Second Step	Third Step
1.	2.	3.
Look at the chart: **Example of Materials** page 6-9	Move on to the **Recommendation table** page 10-17 You will find the right tools in line 1.2	Move on to the according page in the Catalogue
The a.m. material 42CrMo 4 (heat treatable steel), 900 N/mm² is line 1.2	Depending on hole type, chamfer type and thread type you will find the catalogue-no. and the corresponding page.	Here you find all necessary information concerning your tool.

2. Possibility
You already know the Neoboss-Catalogue-No.

See page 4-5 of the Chart of Catalogue-No.s and look for the appropriate page.

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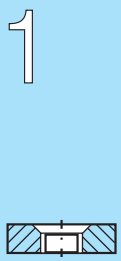
Material Main Group	Material Sub Group	Designation	Standard Designation	DIN-Number	Tensile Strength (N/mm²)	Hardness (HB)	AISI/ SAE/ ASTM
1. Steel	1.1. Unalloyed Steels; Tensile Strength ≤800 N/mm²	Structural Steels	St37-3	1.0116	370 - 450	110 -130	A 264
			St52-3	1.0570	450 - 680	140 - 210	
			St60-2	1.0060	600 - 720	180 - 210	A 572
		Carbon Steels	C10	1.0301	490 - 780	150 - 230	M 1010
			C22	1.0402	470 - 650	140 - 190	1020
			C35	1.0501	550 - 780	170 - 230	1035
			C40	1.0511	600 - 800	180 - 240	1040
		Cast Steels	GS-38 (GE200)	1.0420	380	114	
			GS-45 (GE240)	1.0446	450	133	
			GS-52 (GE260)	1.0552	520	155	
			GS-60 (GE300)	1.0558	600	178	
		Free Cutting Steels	35S 20	1.0726	510 - 880	150 - 260	1140
			9S 20	1.0711	370 - 450	110 - 130	
			9SMn 28	1.0715	390 - 580	110 - 170	1213
			9SMn 36	1.0736	390 - 800	110 - 240	1215
			9SMnPb 28	1.0718	380 - 810	110 - 240	12L13
			9SMnPb 36	1.0737	390 - 800	110 - 240	12L14
		Fine Grain Structural	StE 255 (S255N)	1.0461	310 - 480	90 - 143	
		Steels	StE 460 (P460N)	1.8905	520 - 720	152 - 214	
			StE 500 (S500N)	1.8907	560 - 800	166 - 238	
		Cementation Steels	13Cr 3	1.7012	500 - 800	160 - 240	
			16MnCr 5	1.7131	500 - 700	160 - 210	5115
		Heat Treatable Steels	C15	1.0401	600 - 900	180 - 270	1015
	1.2. Unalloyed and Alloyed Steels; Tensile Strength ≤1000 N/mm²	Structural Steels	Cf53	1.1213	650 - 800	190 - 240	1050
			Ck45	1.1191	650 - 850	190 - 250	1045
			Ck55	1.1203	700 - 950	210 - 280	1055
			Ck60	1.1221	750 - 1000	220 - 300	1060
		Heat Treatable Steels	15Cr 3	1.7015	690 - 1000	200 - 300	5015
			15CrMo 5	1.7262			
			25CrMo 4	1.7218	800 - 1000	240 - 300	4130
			32CrMo 12	1.7361	690 - 1000	200 - 300	
			34Cr 4	1.7033	700 - 1000	210 - 300	5132
			35CrMo 4	1.2330		4135	
			35CrNiMo 6	1.6582	800 - 1000	240 - 300	4340
			40Mn 4	1.1157	800 - 1000	240 - 300	1039
			41Cr 4	1.7035	800 - 1000	240 - 300	5140
			42CrMo 4	1.7225	800 - 1000	240 - 300	4140
			47CrMo 4	1.2332		4142	
			C35 E	1.1181	550 - 780	170 - 240	1035
			C45	1.0503	650 - 850	190 - 250	1045
			C55	1.0535	700 - 950	210 - 280	1055
			C60	1.0601	750 - 1000	220 - 300	1060
			Cf35	1.1183	540 - 780	160 - 230	1035
			Ck22	1.1151	470 - 650	150 - 200	1020
			Ck25	1.1158	500 - 700	150 - 210	1025
		Cementation Steels	14NiCr 14	1.5752	880 -1000	260 - 300	3310
			16MnCr 5	1.7131	780 -1000	230 - 300	5116
			Ck15	1.1141	590 - 880	180 - 260	1015
	1.3.1. Unalloyed and Alloyed Steels; Tensile Strength ≤1200 N/mm²	Cementation Steels	14NiCr 14	1.5752	1000 - 1280	300 - 380	3310
			16MnCr 5 V	1.7131	1000 - 1200	300 - 360	5117
			17CrNiMo 6	1.6587	1080 - 1200	320 - 360	
			17CrNiMo 6	1.6587	1200 - 1400	320 - 410	
		Nitriding Steels	31CrMo V 9	1.8519	1000 - 1250	300 - 370	
			34CnAlNi 7	1.8550			
			35CrNiMo 6	1.6582	1000 - 1200	300 - 360	4340
			39CrMoV 13 9	1.8523	1000 - 1200	300 - 380	
		Heat Treatable Steels	100Cr 6	1.3505		52100	
			25CrMo 4	1.7218	1000 - 1100	300 - 330	4130
			30CrNiMo 8	1.6580	1000 - 1200	300 - 360	
			32CrMo12	1.7361	1000 - 1100	300 - 330	
			34Cr 4	1.7033	1000 - 1100	300 - 330	5132
			40Mn4	1.1157	1000 - 1100	300 - 330	1039
			41CrMo 4	1.7223	1000 - 1200	300 - 360	4140
			42CrMo 4 V	1.7225	1000 - 1200	300 - 380	4141
		Fine Grain Structural	StE690 V	1.8931			
		Steels	StE960 V	1.8941			
		Wear-resistant Steels	HARDOX400				

Material Main Group	Material Sub Group	Designation	Standard Designation	DIN-Number	Tensile Strength (N/mm²)	Hardness (HB)	AISI/ SAE/ ASTM
1. Steel	1.3.1. Unalloyed and Alloyed Steels; Tensile Strength ≤1200 N/mm²	Tool Steels for Cold Work	100Cr 6	1.2067			L3
			100MnCrW 4	1.2510			O1
			100V 1	1.2833			W210
			115CrV 3	1.2210			L2
			50CrV 4	1.8159	1000 - 1200	300 - 360	6150
			58CrV 4	1.8161			
			60WCrV 7	1.2550			S1
			90MnCrV 8	1.2842			O2
			S10-4-3-10	1.3207			
			X100 CrMoV 5 1	1.2363			A2
			X165 CrMoV 12	1.2601			
			X210 Cr 12	1.2080			D3
			X210 CrW 12	1.2436			
			X50 CrMoW 9 11	1.2631			
		Tool Steels for Hot Work	35NiCrMo 16	1.2766			
			40CrMnMo 7	1.2311			
			45WCrV 7	1.2542			S1
			55NiCrMoV 6	1.2713			L6
			60NiCrMoV 12 4	1.2743			
			X30WCrV 5 3	1.2567			
			X30WCrV 9 3	1.2581			H21
			X32CrMoV 3 3	1.2365			H10
			X36CrMo 17	1.2316			
			X38CrMoV 5 1	1.2343			H11
			X40CrMoV 5 1	1.2344			H13
			X42Cr 13	1.2083			420
	1.3.2. Unalloyed and Alloyed Steels; Tensile Strength ≥1200 N/mm²	Heat Proof Steels	35CrNiMo 6	1.6582	1200 -1400	380 - 410	4340
			NiCr19 CoMo	2.4973	1200 -1320	360 - 380	
			X5NiCrTi 26 15	1.4980	930 -1180	280 - 360	
		Tool Steels	50CrV 4	1.8159	1200 -1300	360 - 80	6150
			56NiCrMoV 7	1.2714	1200 -1400	360 - 410	
			X155CrVMo 12 1	1.2379	1200 -1400	360 - 410	D2
	1.3.3. Hardened Steels; 42-50 HRC	Tool Steels	X155CrVMo 12 1	1.2379			D2
			X210CrW 12	1.2436			
			90MnCrV 8	1.2842			O2
		High Speed Steels	S6-5-2	1.3343			M2
			S6-5-3	1.3344			M3 Class 2
		Wear-resistant Steels	HARDOX500				
			TOOLOX 44				
			HARDOX 400				
	1.4. Stainless Steels (V2A-Steels)	Normal Alloyed	GX10CrNi 18 8	1.4312			
			GX20Cr 14	1.4027	590 - 700	180 - 210	
			GX5CrNi 19 10	1.4308	460 - 640	140 - 190	CF-8
			GX8CrNi 13	1.4008	590 - 790	180 - 230	
			X10Cr 13	1.4006	450 - 650	130 - 190	410
			X10CrNiS 18 9	1.4305	500 - 750	160 - 220	303
			X105CrMo 17	1.4125	900	270	440C
			X12CrMoS 17	1.4104	540 - 840	160 - 250	430F
			X12CrNi 17 7	1.4310	700 - 950	210 - 280	301
			X12CrS 13	1.4005			416
			X15Cr 13	1.4024	650 - 800	190 - 240	
			X2CrNi 18 9	1.4306	460 - 850	140 - 250	304L
			X2CrNiN 18 10	1.4311	550 - 760	160 - 220	304LN
			X20Cr 13	1.4021	650 - 950	190 - 280	420
			X20CrNi 17 2	1.4057	800 - 950	240 - 280	431
			X22CrNi 17	1.4057	750 - 950	220 - 280	431
			X3CrNiN 17 8	1.4319			302
			X30Cr 13	1.4028	600 - 780	180 - 230	420F
			X39Cr 13	1.4031	560 - 800	170 - 240	
			X46Cr 13	1.4034	580 - 800	170 - 240	
			X5CrNi 18 12	1.4303	490 - 690	150 - 210	305
			X5CrNi 18 9	1.4301	500 - 700	160 - 210	304
			X5CrNi 18 9	1.4350			304
			X6CrAl 13	1.4002	400 - 700	120 - 210	405
			X6CrMo 17	1.4113	450 - 650	130 - 190	434
			X7Cr 13	1.4000	400 - 700	120 - 210	403
			X8Cr 17	1.4016	450 - 600	130 - 180	430

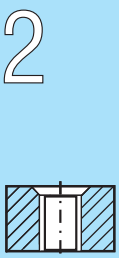
Material Main Group	Material Sub Group	Designation	Standard Designation	DIN-Number	Tensile Strength (N/mm²)	Hardness (HB)	AISI/ SAE/ ASTM
1. Steel	1.5. Stainless Steels with high Chromium-Nickel-Content (V4A-Steels)	High Alloyed	GX5CrNiMo 19 11	1.4408	460 - 640	140 - 190	CF-8M
			GX5CrNiNb 19 10	1.4552	440 - 640	130 - 190	
			X1NiCrMoCuN 25 20 5	1.4539	520 - 720	150 - 210	UNSN08904
			X6CrNiTi 18-10	1.4541	500 - 700	150 - 210	321
			X2CrMoTi 18 2	1.4521	450 - 650	130 - 190	443
			X2CrNiMo 17 13 2	1.4404	490 - 850	150 - 250	316L
			X2CrNiMo 18 12	1.4435	490 - 690	150 - 210	316L
			X2CrNiMo 18 16	1.4438	490 - 690	150 - 210	317L
			X2CrNiMoN 17 12 2	1.4406	580 - 800	170 - 240	316LN
			X2CrNiMoN 17 13 3	1.4429	580 - 800	170 - 240	316LN
			X2CrNiMoN 22 5 3	1.4462	680 - 880	200 - 260	
			X3NiCrCuMoTi 27 23	1.4503	500 - 700	160 - 210	
			X4CrNiMoN 27 5 2	1.4460	600 - 800	180 - 240	329
			X5CrNiCuNb 17 4	1.4542			630
			X5CrNiMo 17 1	1.4401	510 - 710	150 - 210	316
			X5CrNiMo 17 13	1.4449			317
			X5CrNiMo 17 13 3	1.4436	510 - 710	150 - 210	316
			X5CrNiNb 18 10	1.4546	410 - 610	130 - 190	348
			X5NiCrMoCuNb 20 18	1.4505	490 - 740	160 - 220	
			X6CrNb 17	1.4511	450 - 600	130 - 180	
			X6CrNiMoTi 17 12 2	1.4571	500 - 730	160 - 220	316Ti
			X6CrNiNb 18 10	1.4550	550 - 750	160 - 220	347
			X6CrTi 12	1.4512	330 - 560	100 - 170	409
			X6CrTi 17	1.4510	450 - 600	130 - 180	439
	1.6. High Temperature Stainless Steels (V2A- and V4A-Steels)	High Temperature	X12CrNiMo12	1.4939	950 - 1150	280 - 340	S 64152
			X5NiCrTi26-15	1.4980	930 - 1180	275 - 348	660
			X5CrNi 13 4	1.4313	1000 - 1200	295 - 354	S 41500
			GX30CrSi6	1.4710	1190 - 1550	350 - 450	
			X50CrMnNiNbN21-9	1.4882	950 - 1150	280 - 340	S 63019
			X55CrMnNiN20-8	1.4875	900 - 1150	266 - 340	S 63012
			X19CrMoNbVN11-1	1.4913	950 - 1150	280 - 340	
			X14CrMoS17	1.4104	~ 930	275	430 F
			X4CrNiMo16-5-1	1.4418	~1250	370	
			X5CrNiCuNb16-4	1.4542	800 - 1270	238 - 375	630
			GXZ5CrNi13-4	1.4317	900 - 1100	266 - 325	
			X20CrMo13	1.4120	880 - 1470	260 - 435	
	1.7. High Speed Steels	High Speed Steels	S12-1-4-5	1.3202			T15
			S18-0-1	1.3355			T1
			S18-1-2-10	1.3265			T5
			S18-1-2-5	1.3255			T4
			S2-10-1-8	1.3247			M42
			S2-9-1	1.3346			M1
			S2-9-2	1.3348			M7
			S2-9-2-8	1.3249			M34
			S5-5-3	1.3344			M3 Class2
			S6-5-2	1.3343			M2
			S6-5-2-5	1.3243			
			S7-4-2-5	1.3246			M41
			SC6-5-2	1.3342			M3
2. Cast Iron	2.1. Grey Cast Iron (GG)	Grey Cast Iron	GG10 (EN-GJL-100)	0.6010			A48-20 B
			GG15 (EN-GJL-150)	0.6015	110 - 150	35 - 50	A48-25 B
			GG20 (EN-GJL-200)	0.6020	150 - 200	50 - 60	A48-30 B
			GG25 (EN-GJL-250)	0.6025	200 - 250	60 - 80	A48-35 B
			GG30 (EN-GJL-300)	0.6030	240 - 270	75 - 85	A48-45 B
			GG35 (EN-GJL-350)	0.6035	280 - 320	90 - 100	A48-50 B
			GG40 (EN-GJL-400)	0.6040	350 - 450	110 - 130	A48-55 B
	2.2. Nodular and Malleable Cast Iron (GGG, GT)	Nodular Cast Iron	GGG40 (EN-GJS-400-25)	0.7040	400	120	60-40-18
			GGG50 (EN-GJS-500-7)	0.7050	500	160	80-55-06
			GGG60 (EN-GJS-600-3)	0.7060	600	190	80-55-06
			GGG70 (EN-GJS-700-2)	0.7070	700	210	100-70-03
			GGG80 (EN-GJS-800-2)	0.7080	800	238	120-90-02
		Malleable Cast Iron	GTS55-05	0.8055	550	170	50005
			GTW35-04	0.8035	350	110	
	2.3. Vermicular Cast Iron (GGV, GJV, CGI)	Vermicular Cast Iron	GJV-300				
			GJV-400				
			GGV-30				
			GGV-40				

Material Main Group	Material Sub Group	Designation	Standard Designation	DIN-Number	Tensile Strength (N/mm²)	Hardness (HB)	AISI/ SAE/ ASTM
3. Nonferrous Metals	3.1. Aluminium, Copper, Copper Alloys	Unalloyed Aluminium	Al99	3.0205	75 - 140	20 - 50	
			Al99.9	3.0305	100 - 120	30 - 40	
			Al99.9 R	3.0400	60 - 120	20 - 40	
			E-Al	3.0257			
		Unalloyed Copper	SF-Cu	2.0090	300 - 350	90 - 110	
		Longchipping Brass	CuZn20 (Ms80)	2.0250			
			CuZn30 (Ms70)	2.0265			
			CuZn37	2.0321	300 - 400	90 - 110	
		Bronze	G-CuSn 6 ZnNi	2.1093	400 - 450	120 - 130	
		Red Brass	G-CuSn 5 ZnPb	2.1096	200 - 250	60 - 80	
	3.2.1. Aluminium Alloys, Copper Alloys	Aluminium Alloys	G-AlSi 12	3.2581	160 - 210	50 - 70	A413.2
			G-AlSi 10 Mg	3.2383	170 - 220	50 - 70	
			G-AlSi 12 (Cu)	3.2583	150 - 220	50 - 70	
			G-AlSi 5 Mg	3.2341	140 - 300	50 - 90	
			G-AlSi 6 Cu	3.2151	160 - 200	50 - 90	
			G-AlSi 7 Mg	3.2371	170 - 300	50 - 90	
			G-AlSi 8 Cu 3	3.2161	160 - 200	50 - 60	
			G-AlSi 9 Mg	3.2373	250 - 300	80 - 90	
			G-CuAl 10 Ni	2.0975	650 - 750	190 - 220	
			GD-AlSi 12 (Cu)	3.2982	450 - 550	130 - 170	
		Bronze, Hard	CuSn 6 Zn 6	2.1080	550 - 700	170 - 210	
	3.2.2. Special Aluminium Alloys	Special Aluminium Alloys	AlCuMg 1	3.1325	215 - 395	70 - 120	
			AlMg 1	3.3315	105 - 210	30 - 70	
			AlMg 1,5	3.3316	130 - 240	40 - 75	
			AlMg 1 SiCu	3.3211	150 - 290	50 - 90	
			AlMg 2,5	3.3523	170 - 290	50 - 90	
			AlMg 3	3.3535	190 - 305	60 - 100	
			AlMg 5	3.3555	250 - 280	80 - 90	
			AlMgSi 0,5	3.3206	140 - 200	40 - 60	
			AlMgSi 1	3.2315	150 - 315	50 - 100	
			AlMn 1 Mg 0,5	3.0525	125 - 20	40 - 70	
			AlMnCu	3.0517	125 - 210	40 - 70	
			AlZnMgCu 0,5	3.4345	400 - 460	120 - 180	
			AlZnMgCu 1,5	3.4365	480 - 530	150 - 170	
			G-AlMg 5	3.3561	160 - 220	50 - 70	
			G-AlMg 5Si	3.3261	160 - 200	50 - 60	
	3.3. Copper Alloys, Short Chipping	Short Chipping Brass	CuZn39Pb 2 (Ms58)	2.0380	~630	190	
			CuZn40 (Ms60)	2.0360			
			CuZn40MnPb	2.0580	400	120	
			CuZn44Pb 2	2.0410	630	190	
4. Special Alloys	4.1. Nickel Alloys	Nickel Alloys	NiCr17Mo17FeW (Hastelloy C)		DIN-Nr. 2.4602		
			NiCR19Fe19NbMo (Inconel 718)		DIN-Nr. 2.4668		
			Ni-Cr20Ti (Nimonic 75)		DIN-Nr. 2.4630		
			NiCr20TiAl (Nimonic 80/80A)		DIN-Nr. 2.4631		
			NiCr20Co14MoTi (Waspaloy)		DIN-Nr. 2.4654		
			NiCr21Mo (Incoloy 825)		DIN-Nr. 2.4858		
			NiCu30Fe (Monel 400)		DIN-Nr. 2.4360		
			NiCo15Cr10MoAlTi (Nimocast PK24)		DIN-Nr. 2.4674		
	4.2. Titanium Alloys	Titanium Alloys	TiAl 5 Sn 2	3.7115	790 - 980	230 - 290	
			TiAl 6 V 4	3.7165	980 - 1140	290 - 340	
	4.3. Cu-Al-Fe-Alloys	Chilled Cast Iron	Ampco 21		965 - 1060	285 - 311	
			Ampco 22		1090 - 1130	321 - 352	
			Ampco 25		1140 - 1280	356 - 394	
			Ampco 26		1290 - 1450	395 - 450	
5. Plastics	5.1. Thermoplastics	Thermoplastics	Polyamid				
			Polystyrol				
			Polyvinylchloride				
			Ultramid				
	5.2. Thermosetting Plastics and Fibre Reinforced Plastics	Thermosetting Plastics	Bakelit				
			Ferrozell				
			Pertinax				
			Fibre Reinforced Plastics	CFK GFK	190 - 210	60 - 70	

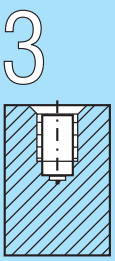
Type of Hole



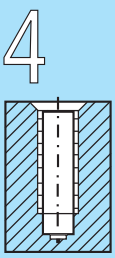
Through Hole
Depth of Thread
up to 2 x d_1



Through Hole
Depth of Thread
up to 3 x d_1



Blind Hole
Depth of Thread
up to 2 x d_1



Blind Hole
Depth of Thread
up to 3 x d_1

Chamfer

Form A	Form B	Form C	Form D	Form E	Form F
5 - 6 Threads	4 - 5 Threads	2 - 3 Threads	3,5 - 5 Threads	1,5 - 2 Threads	1-1,5 Threads

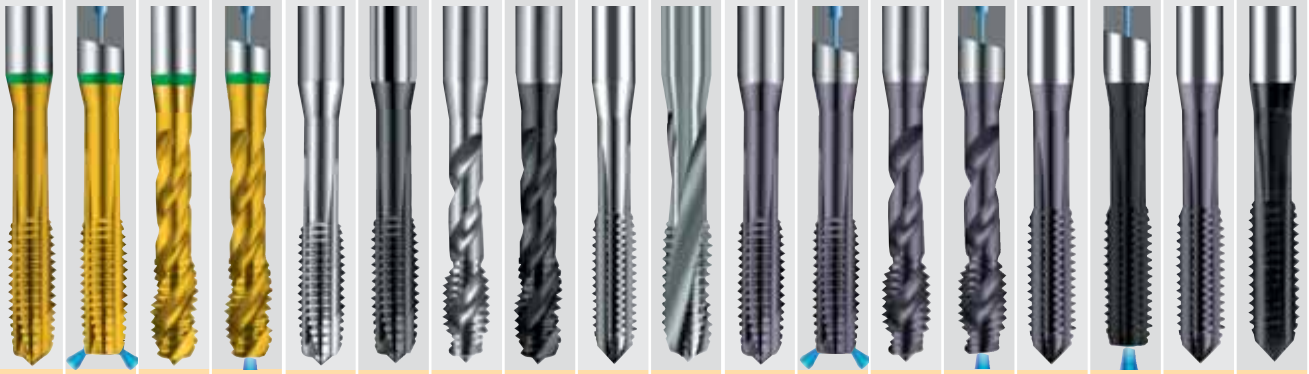
Type of Hole
Chamfer
M
MF
BSW
G
Rp
Rc
NPT
NPTF
NPSM
UNC
UNF
UNEF
UN
Pg
Tr
Rd
EG-M
EG-UNC

KA*) Axial Internal Cooling
KR*) Radial Internal Cooling

Coolant
Ö = Cutting Oil
E = Emulsion
S = Special Cutting Oil
T = Dry, Air

Material Main Groups	Material Sub Groups		Cutting Speed v_c = m/min Uncoated	Cutting Speed v_c = m/min Coated	Coolant	Cat.-No. DIN 371 / DIN 376/374
1. Steels	1.1.	Unalloyed Steels; RM ≤ 800 N/mm²	10 - 20	20 - 50	Ö/E	
	1.2.	Unalloyed and Alloyed Steels; RM ≤1000 N/mm²	10 - 20	20 - 50	Ö/E	
	1.3.1	Unalloyed and Alloyed Steels; RM ≤ 1200 N/mm²	3 - 10	5 - 20	Ö/E	
	1.3.2.	Unalloyed and Alloyed Steels; RM ≥ 1200 N/mm²	2 - 5	3 - 10	Ö/S	
	1.3.3.	Hardened Steels; 42 - 50 HRC		2 - 5	Ö/S	
	1.4.	Stainless Steels (V2A-Steels)	6 - 10	10 - 20	Ö/E	
	1.5	Stainless Steels with high Chromium-Nickel-Content (V4A-Steels)	6 - 10	10 - 20	Ö/E	
	1.6.	High Temperature Stainless Steels (V2A- and V4A-Steels)	3 - 10	5 - 20	Ö/E	
	1.7.	High Speed Steels	6 - 10	10 - 20	Ö/E	
2. Cast Iron	2.1.	Grey Cast Iron (GG)	10 - 20	20 - 50	T/E	
	2.2.	Nodular and Malleable Cast Iron (GGG, GT)	10 - 20	20 - 50	T/E	
	2.3.	Vermicular Cast Iron (GGV, GJV, CGI)	10 - 20	20 - 50	T/E	
3. Nonferrous Metalls	3.1.	Aluminium, Copper, Copper Alloys	20 - 40	30 - 50	Ö/E	
	3.2.1.	Aluminium Alloys, Copper Alloys	10 - 30	30 - 50	Ö/E	
	3.2.2.	Special Aluminium Alloys	20 - 30	30 - 50	Ö/E	
	3.3	Copper Alloys, Short Chipping	10 - 30		Ö/E	
4. Special Alloys	4.1.	Nickel Alloys		2 - 4	S	
	4.2.	Titanium Alloys	4 - 6		S	
	4.3.	Cu-Al-Fe-Alloys		3 - 10	Ö/E	
5. Plastics	5.1.	Thermoplastics	20 - 30	20 - 30	T	
	5.2.	Thermosetting Plastics and Fibre Reinforced Plastics	10 - 15	15 - 20	T	

Type of Thread and Catalogue Page

	2	2	3/4	3/4	2	2	3/4	3/4	1/3	3	2	2	3/4	3/4	2/4	2/4	2/4	2/4
	B	B	C	C	B	B	C	C	C	C	B	B	C	C	C	C	E	C
	22/23	22/23	24/25	24/25	26/27	26/27	28/29	28/29	66/67	68	63	63	64	64	48/65	48/65	48	48/49
	78	78	79	79	81	80	81	80	92	92					91	89		89
					100/101		100/101		100/101	100								
	103		103		104	104	104	104	109	109					107			107
									111									
									118									
	120/121		120/121		122/123		122/123		128/129									126/127
	131/132		131/132		133/134		133/134		139/140									137/138
					146				146	146								
	Rapid-UNI TiN	Rapid-UNI KR*) TiN	Grulo-UNI TiN	Grulo-UNI KA*) TiN	Rapid	Rapid vap.	Grulo	Grulo vap.	C	RSP	Rapid TM TiAlN	Rapid TM KR*) TiAlN	Grulo TM TiAlN	Grulo TM KA*) TiAlN	C-GG TM TiAlN	C-GG TM KA*) TiAlN	C-GG TM TiAlN	C-GG nit.
																		
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→	7275/80	B7275/80	6345/80	B6345/80	7011	7011/78	6040	6040/78	6002	6030	7271/70	B7271/70	6340/70	B6340/70	6308/70	B6308/70	6309/70	6008/06
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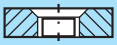
Application: ● recommended ❍ suitable ■ also recommended for dry cutting / MKS □ suitable

Type of Hole

1

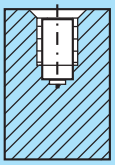


Through Hole
Depth of Thread
up to 2 x d_1

2

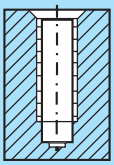
Through Hole
Depth of Thread
up to 3 x d_1

3



Blind Hole
Depth of Thread
up to 2 x d_1

4



Blind Hole
Depth of Thread
up to 3 x d_1

Chamfer

Form A	Form B	Form C	Form D	Form E	Form F
5 - 6 Threads	4 - 5 Threads	2 - 3 Threads	3,5 - 5 Threads	1,5 - 2 Threads	1 - 1,5 Threads

Type of Hole
Chamfer
M
MF
BSW
G
Rp
Rc
NPT
NPTF
NPSM
UNC
UNF
UNEF
UN
Pg
Tr
Rd
EG-M
EG-UNC

KA*) Axial Internal Cooling
KR*) Radial Internal Cooling

Coolant
Ö = Cutting Oil
E = Emulsion
S = Special Cutting Oil
T = Dry, Air

Material Main Groups	Material Sub Groups		Cutting Speed v_c = m/min Uncotaetd	Cutting Speed v_c = m/min Coated	Coolant	Cat.-No. DIN 371 / DIN 376/374
1. Steels	1.1.	Unalloyed Steels; RM ≤ 800 N/mm²	10 - 20	20 - 50	Ö/E	
	1.2.	Unalloyed and Alloyed Steels; RM ≤ 1000 N/mm²	10 - 20	20 - 50	Ö/E	
	1.3.1	Unalloyed and Alloyed Steels; RM ≤ 1200 N/mm²	3 - 10	5 - 20	Ö/E	
	1.3.2.	Unalloyed and Alloyed Steels; RM ≥ 1200 N/mm²	2 - 5	3 - 10	Ö/S	
	1.3.3.	Hardened Steels; 42 - 50 HRC		2 - 5	Ö/S	
	1.4.	Stainless Steels (V2A-Steels)	6 - 10	10 - 20	Ö/E	
	1.5	Stainless Steels with high Chromium-Nickel-Content (V4A-Steels)	6 - 10	10 - 20	Ö/E	
	1.6.	High Temperature Stainless Steels (V2A- and V4A-Steels)	3 - 10	5 - 20	Ö/E	
	1.7.	High Speed Steels	6 - 10	10 - 20	Ö/E	
2. Cast Iron	2.1.	Grey Cast Iron (GG)	10 - 20	20 - 50	T/E	
	2.2.	Nodular and Malleable Cast Iron (GGG, GT)	10 - 20	20 - 50	T/E	
	2.3.	Vermicular Cast Iron (GGV, GJV, CGI)	10 - 20	20 - 50	T/E	
3. Nonferrous Metals	3.1.	Aluminium, Copper, Copper Alloys	20 - 40	30 - 50	Ö/E	
	3.2.1.	Aluminium Alloys, Copper Alloys	10 - 30	30 - 50	Ö/E	
	3.2.2.	Aluminium Special Alloys	20 - 30	30 - 50	Ö/E	
	3.3	Copper Alloys, Short Chipping	10 - 30		Ö/E	
4. Special Alloys	4.1.	Nickel Alloys		2 - 4	S	
	4.2.	Titanium Alloys	4 - 6		S	
	4.3.	Cu-Al-Fe-Alloys		3 - 10	Ö/E	
5. Plastics	5.1.	Thermoplastics	20 - 30	20 - 30	T	
	5.2.	Thermosetting Plastics and Fibre Reinforced Plastics	10 - 15	15 - 20	T	

Type of Thread and Catalogue Page

	2	2	3	3/4	2	2	3/4	3/4	2	3/5	2/3	2	2	3/4	3/4	2	2	3/4	3/4
	B	C	C	E	B	B	C	C	B	C	D	B	B	C	C	B	B	C	C
	30/31	32/33	32/33	32/33	38/39	40/41	40/41	38/39	42/43	42/43	42/43	44/45	44/45	46/47	46/47	44/45	44/45	46/47	46/47
	84	84	84		86	86	86	86				88	88	88	88	87	87	87	87
	105	105															106		106
	122/123	122/123					124/125	124/125									126/127		126/127
	133/134	133/134					135/136	135/136									137/138		137/138
																			143
	Rapid-VA-G	Grulo Spez-G	RSP-Spez-G	Grulo-Spez-G	Rapid-Spez-R TiCN	Rapid-Spez-R nit.	Grulo-Spez-R TiCN	Grulo-Spez-R	Rapid-S TiCN	RSP-Spez-S TiN	D-PM TiCN	Rapid VA-G TiCN	Rapid VA-G vap.	Grulo-VA-G TiCN	Grulo-Spez-G vap.	Rapid-V4A TiCN	Rapid-V4A vap.	Grulo-V4A TiCN	Grulo-V4A vap.
																			
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→	7275	6345	6055	6341	7255/81	7255/06	6245/81	6245	7880/81	6890/80	6853/81	7375/81	7375/78	6445/81	6445/78	7235/81	7235/78	6365/81	6365/78
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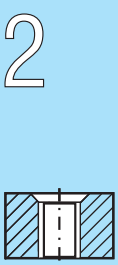
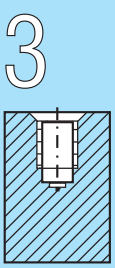
Application: ● recommended ❍ suitable ■ also recommended for dry cutting / MKS □ suitable

Type of Hole

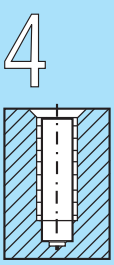
Through Hole
Depth of Thread
up to 2 x d_1



Through Hole
Depth of Thread
up to 3 x d_1



Blind Hole
Depth of Thread
up to 2 x d_1



Blind Hole
Depth of Thread
up to 3 x d_1

Chamfer

Form A	Form B	Form C	Form D	Form E	Form F
5 - 6 Threads	4 - 5 Threads	2 - 3 Threads	3,5 - 5 Threads	1,5 - 2 Threads	1 - 1,5 Threads

Type of Hole
Chamfer
M
MF
BSW
G
Rp
Rc
NPT
NPTF
NPSM
UNC
UNF
UNEF
UN
Pg
Tr
Rd
EG-M
EG-UNC

KA*) Axial Internal Cooling
KR*) Radial Internal Cooling

Coolant
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1. Steels	1.1.	Unalloyed Steels; RM ≤ 800 N/mm²	10 - 20	20 - 50	Ö/E	
	1.2.	Unalloyed and Alloyed Steels; RM ≤ 1000 N/mm²	10 - 20	20 - 50	Ö/E	
	1.3.1	Unalloyed and Alloyed Steels; RM ≤ 1200 N/mm²	3 - 10	5 - 20	Ö/E	
	1.3.2.	Unalloyed and Alloyed Steels; RM ≥ 1200 N/mm²	2 - 5	3 - 10	Ö/S	
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2. Cast Iron	2.1.	Grey Cast Iron (GG)	10 - 20	20 - 50	T/E	
	2.2.	Nodular and Malleable Cast Iron (GGG, GT)	10 - 20	20 - 50	T/E	
	2.3.	Vermicular Cast Iron (GGV, GJV, CGI)	10 - 20	20 - 50	T/E	
3. Nonferrous Metals	3.1.	Aluminium, Copper, Copper Alloys	20 - 40	30 - 50	Ö/E	
	3.2.1.	Aluminium Alloys, Copper Alloys	10 - 30	30 - 50	Ö/E	
	3.2.2.	Special Aluminium Alloys	20 - 30	30 - 50	Ö/E	
	3.3	Copper Alloys, Short Chipping	10 - 30		Ö/E	
4. Special Alloys	4.1.	Nickel Alloys		2 - 4	S	
	4.2.	Titanium Alloys	4 - 6		S	
	4.3.	Cu-Al-Fe-Alloys		3 - 10	Ö/E	
5. Plastics	5.1.	Thermoplastics	20 - 30	20 - 30	T	
	5.2.	Thermosetting Plastics and Fibre Reinforced Plastics	10 - 15	15 - 20	T	

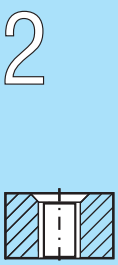
Type of Thread and Catalogue Page

	2	2	3/4	3/4	3/4	2	2	3/4	3/4	3/4	3/4	2	3/4	2/4	2/4	2/4	2/4
	B	B	C	C	C	B	B	C	C	E	E	B	C	C	C	C	C
	34/35	34/35	36/37	36/37	36/37	54/55	54/55	56/57	56/57	56/57	56	50/51	52/53	58	58	59	59
	85		85														
	106		106														
	124/125		124/125														
	135/136		135/136														
				142													
	Rapid-Spez nit.	Rapid-Spez TiN	Grulo-Spez	Grulo-Spez vap.	Grulo-Spez TiN	Rapid-Alutop DLC	Rapid-Alu-top KR*) DLC	Grulo-Alutop DLC	Grulo-Alu-top KA*) DLC	Grulo-Alutop DLC	Grulo-Alu-top KA*) DLC	Rapid-Al	Grulo-Al	C-Ms	C-Ms	C-VA-S-Ti vap.	C-Bak nit.
																		
→	7045/06	7045/80	4045	4045/78	4045/80	7450/77	B7450/77	4350/77	B4350/77	4351/77	B4351/77	7410	4044	4057	4057/92	4880/78	4056/06
→	7055/06	7055/80	6045	6045/78	6045/80	7451/77	B7451/77	6350/77	B6350/77	6351/77	B6351/77	7411	6044			6880/78	
	●	●	●	●	●												
	●	●	●	●	●												
	❍	●		❍	●												
	❍	❍		❍	❍												
	❍	❍		❍	❍												
						●	●	●	●	●	●	●	●				
						●	●	●	●	●	●						
						●	●	●	●	●	●						
														●	●		
																●	
													❍				
																	●

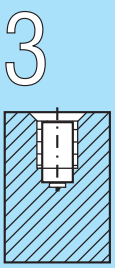
Application: ● recommended ❍ suitable ■ also recommended for dry cutting / MKS □ suitable

Type of Hole

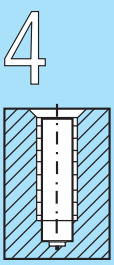
Through Hole
Depth of Thread
up to 2 x d_1



Through Hole
Depth of Thread
up to 3 x d_1



Blind Hole
Depth of Thread up to
2 x d_1



Blind Hole
Depth of Thread
up to 3 x d_1

Chamfer

Form A	Form B	Form C	Form D	Form E	Form F
5 - 6 Threads	4 - 5 Threads	2 - 3 Threads	3,5 - 5 Threads	1,5 - 2 Threads	1 - 1,5 Threads

Type of Hole
Chamfer
M
MF
BSW
G
Rp
Rc
NPT
NPTF
NPSM
UNC
UNF
UNEF
UN
Pg
Tr
Rd
EG-M
EG-UNC

KA*) Axial Internal Cooling
KR*) Radial Internal Cooling

Coolant
Ö = Cutting Oil
E = Emulsion
S = Special Cutting Oil
T = Dry, Air

Material Main Groups	Material Sub Groups		Cutting Speed v_c = m/min Coated	Coolant	Cat.-No. DIN 371 / DIN 376/374
1. Steels	1.1.	Unalloyed Steels; RM ≤ 800 N/mm²	20 - 30	Ö/E	
	1.2.	Unalloyed and Alloyed Steels; RM ≤ 1000 N/mm²	20 - 30	Ö/E	
	1.3.1	Unalloyed and Alloyed Steels; RM ≤ 1200 N/mm²		Ö/E	
	1.3.2.	Unalloyed and Alloyed Steels; RM ≥ 1200 N/mm²			
	1.3.3.	Hardened Steels; 42 - 50 HRC			
	1.4.	Stainless Steels (V2A-Steels)	10 - 20	Ö/E	
	1.5	Stainless Steels with high Chromium-Nickel-Content (V4A-Steels)	10 - 20	Ö/E	
	1.6.	High Temperature Stainless Steels (V2A- and V4A-Steels)	10 - 20	Ö/E	
	1.7.	High Speed Steels			
2. Cast Iron	2.2.	Grey Cast Iron (GG)			
	2.3.	Nodular and Malleable Cast Iron (GGG, GT)	20 - 30	Ö/E	
	2.4.	Vermicular Cast Iron (GGV, GJV, CGI)			
3. Nonferrous Metalls	3.1.	Aluminium, Copper, Copper Alloys	30 - 40	Ö/E	
	3.2.1.	Aluminium Alloys, Copper Alloys	30 - 40	Ö/E	
	3.2.2.	Special Aluminium Alloys	30 - 40	Ö/E	
	3.3	Copper Alloys, Short Chipping			
4. Special Alloys	4.1.	Nickel Alloys			
	4.2.	Titanium Alloys			
	4.3.	Cu-Al-Fe-Alloys			
5. Plastics	5.1.	Thermoplastics			
	5.2.	Thermosetting Plastics and Fibre Reinforced Plastics			

Roll Taps

Type of Thread and Catalogue Page

	2/4 60/62	2 60	2/4 61	2/4 61	2/4 61	2/4 61	2/4 61	2/4 60/62				2/4	2/4	2/4	2/4	2/4			
	90							90											
	108																		
												112							
												114	114	114					
												116							
															149	148			
	Formex TiN	Formex TiN	Formex TiN	Formex TiN	Formex TiN	Formex TiCN	Formex TiCN	Formex CrN											
																			
→	4060/80 6060/80	4063/80 6063/80	4076/80 6076/80	4065/80 6065/80	4067/80 6067/80	4069/81 6069/81	4072/81 6072/81	4064/79 6064/79			*Coolant*	2700/78	2750/78	6700/78	6750/80	6750/78	3000	3010	
	●	●	●	●	●	❍	❍				Ö/E	●	●	●	●	●	●	●	
	❍	❍	●	●	●	❍	❍				Ö/E	❍	●	❍	●	●	●	●	
			●	●	●	❍	❍				Ö/E								
											Ö/S								
											Ö/S								
						●	●				Ö/E		●		●	●		●	
						●	●				Ö/E		●		●	●		●	
						●	●				Ö/E								
			❍	❍	❍	❍	❍				T/E				●			●	
											T/E				●			●	
	❍	❍	❍	❍	❍	●	●				Ö/E		●			●			
											Ö/E	●	●	●	●	●		●	
	❍	❍	❍	❍	❍	❍	❍	●			Ö/E	●	●	●	●	●		●	
	❍	❍	❍	❍	❍	❍	❍	●			T/Ö								
	❍	❍	❍	❍	❍	❍	❍	●			S								

Cutting Speed valid for Roll Taps only

Application: ● recommended ❍ suitable

Neoboss Coatings

Advantages: • improved thread quality • precise accuracy to gauge • increased cutting speed • extended tool life	**TiN** TiN-coated Neoboss taps can be used universally.	**TiCN** Due to its high hardness and favourable viscosity TiCN-coating is recommended for difficult chipping and hard materials.	**TiAlN** Its extreme hardness and gliding quality guarantees high wear resistance against abrasive materials such as cast iron and Aluminium alloys. Its high ductility as well as thermal and chemical stability is extremly well suited for dry cutting and high speed cutting.	**CrN** This chrome nitride-coating with its high adhesive strength and excellent chemical durability is extremely well suited for thread rolling in Aluminium.	**DLC** With its high wear resistance and slight adhesion on nonferrous metals DLC-coating is perfectly recommended for cutting Aluminium and Aluminium alloys.
Micro Hard. (HV 0,05)	**2300**	**3000**	**3300**	**1750**	**2800**
Colour of Coating	**gold**	**blue-grey**	**purple - dark grey**	**silver-grey**	**black**
Application	universal	difficult chipping materials	abrasive material; dry cutting / MKS	Rolling of Aluminium	Aluminium, Aluminium alloys

Recommendation of Tools with Internal Cooling System (KSS)

Taps with Internal Cooling:
All machine taps size M5 and above are available with Internal Cooling System (KSS)

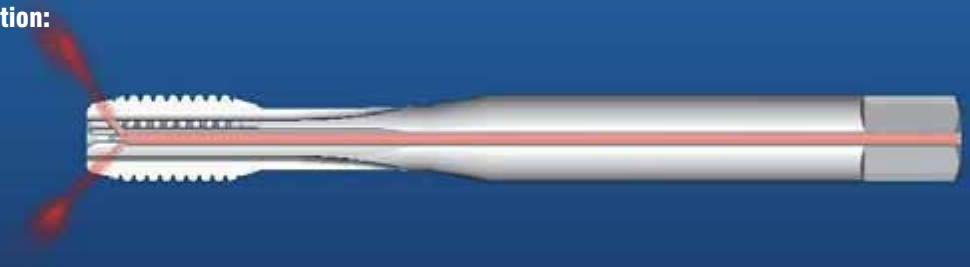
Advantages of KSS:
- excellent cooling and lubrication
- improved removal of chips
- high quality of thread surface
- increased cutting speed
- higher tool life

Blind Holes: KSS axial

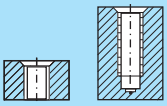
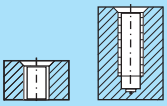
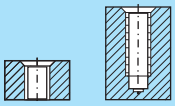
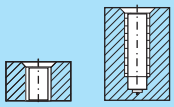
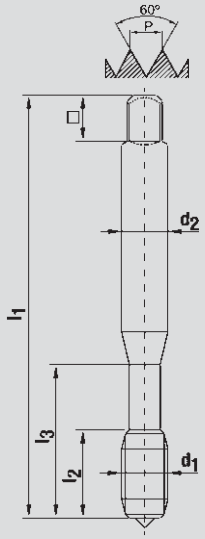
Designation:
KA

Through Holes: KSS radial

Designation:
KR



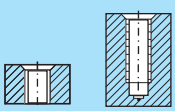
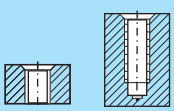
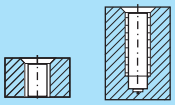
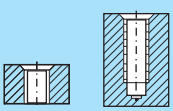
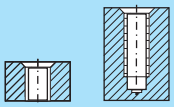
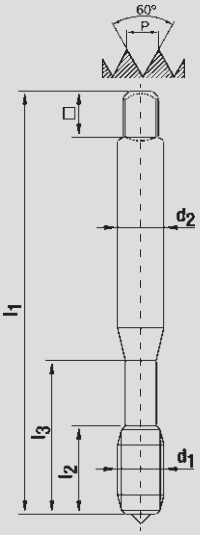
HSSE DIN 371 **M**

Version	Form C, 2-3 Threads Chamfer, from M 5 with Oil Flutes	Form C, 2-3 Threads Chamfer, from M 5 with Oil Flutes, KA = Axial Internal Cooling · Size M6 and up	Form C, 2-3 Threads Chamfer, from M 5 with Oil Flutes	Form D, 3,5-5 Threads Chamfer, from M 5 with Oil Flutes	Form C, 2-3 Threads Chamfer, from M 5 with Oil Flutes
Type of Hole					
Surface Treatment	TiN-Coating	TiN-Coating	TiN-Coating	TiN-Coating	CrN-Coating
Catalogue-No.	4060/80	B4060/80	4061/80	4063/80	4064/79
Tolerance	6HX	6HX	6GX	6HX	6HX
	Formex TiN 	Formex TiN with KA 	Formex TiN 	Formex TiN 	Formex CrN 
Application add. see Page 16, 17	Unalloyed Steels; Tensile Strength ≤ 800 N/mm²				Aluminium Alloys, Copper Alloys
Coolant	Cutting Oil or Emulsion				Cutting Oil or Emulsion
Cutting Speed v_c	20 - 30 m/min				30 - 40 m/min

d_1	P (mm)	l_1	l_2	l_3	d_2	□	* ø Di
M 3	0,5	56	10	18	3,5	2,7	2,80
M 4	0,7	63	12	21	4,5	3,4	3,70
M 5	0,8	70	14	25	6	4,9	4,65
M 6	1	80	16	30	6	4,9	5,55
M 8	1,25	90	18	35	8	6,2	7,40
M 10	1,5	100	20	39	10	8	9,30

* The recommended core hole diameters are for reference purpose only.

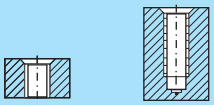
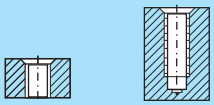
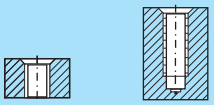
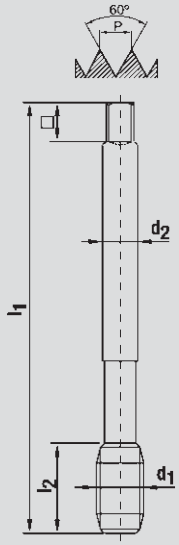
PM DIN 371 **M**

Version	Form E, 1,5-2 Threads Chamfer, from M 5 with Oil Flutes	Form F, 1-1,5 Threads Chamfer, from M 5 with Oil Flutes	Form C, 2-3 Threads Chamfer, from M 5 with Oil Flutes	Form C, 2-3 Threads Chamfer, from M 5 with Oil Flutes	Form E, 1,5-2 Threads Chamfer, from M 5 with Oil Flutes
Type of Hole					
Surface Treatment	TiN-Coating	TiN-Coating	TiN-Coating	TiCN-Coating	TiCN-Coating
Catalogue-No.	4065/80	4067/80	4076/80	4069/81	4072/81
Tolerance	6HX	6HX	6HX	6HX	6HX
	Formex TiN 	Formex TiN 	Formex TiN 	Formex TiCN 	Formex TiCN 
Application add. see Page 16, 17	Unalloyed and Alloyed Steels; Tensile Strength ≤ 1200 N/mm²		Unalloyed and Alloyed Steels; Tensile Strength ≤ 1200 N/mm²	Stainless Steels (V2A- and V4A-Steels)	
Coolant	Cutting Oil or Emulsion		Cutting Oil	Cutting Oil or Emulsion	
Cutting Speed v_c	20 - 30 m/min		20 - 30 m/min	10 - 20 m/min	

d_1	P (mm)	l_1	l_2	l_3	d_2		* ⌀D
M 3	0,5	56	10	18	3,5	2,7	2,80
M 4	0,7	63	12	21	4,5	3,4	3,70
M 5	0,8	70	14	25	6	4,9	4,65
M 6	1	80	16	30	6	4,9	5,55
M 8	1,25	90	18	35	8	6,2	7,40
M 10	1,5	100	20	39	10	8	9,30

* The recommended core hole diameters are for reference purpose only.

HSSE DIN 376 **M**

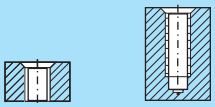
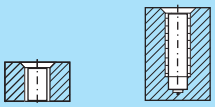
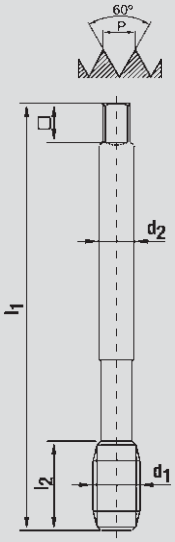
Version	Form C, 2 - 3 Threads Chamfer, with Oil Flutes	Form C, 2 - 3 Threads Chamfer, with Oil Flutes, KA = Axial Internal Cooling	Form C, 2 - 3 Threads Chamfer, with Oil Flutes
Type of Hole			
Surface Treatment	TiN-Coating	TiN-Coating	CrN-Coating
Catalogue-No.	6060/80	B6060/80	6064/79
Tolerance	6HX	6HX	6HX
	Formex TiN 	Formex TiN with KA 	Formex CrN 
Application add. see Page 16, 17	Unalloyed Steels; Tensile Strength ≤ 800 N/mm²		Aluminium Alloys, Copper Alloys
Coolant	Cutting Oil or Emulsion		Cutting Oil or Emulsion
Cutting Speed v_c	20 - 30 m/min		30 - 40 m/min

d_1	P (mm)	l_1	l_2	d_2	□	* ⌀D
M 12	1,75	110	22	9	7	11,20
M 16	2	110	26	12	9	15,10
M 20	2,5	140	30	16	12	18,90

* The recommended core hole diameters are for reference purpose only.

Contents

HSSE DIN 374 **MF**

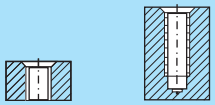
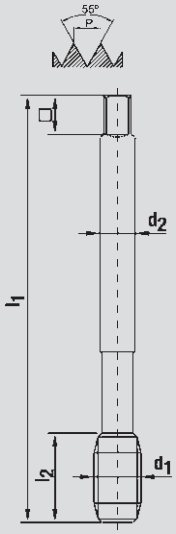
Version	Form C, 2- 3 Threads Chamfer, with Oil Flutes	Form C, 2 - 3 Threads Chamfer, with Oil Flutes
Type of Hole		
Surface Treatment	TiN-Coating	CrN-Coating
Catalogue-No.	6060/80	6064/79
Tolerance	6HX	6HX
	Formex TiN 	Formex CrN 
Application add. see Page 16, 17	Unalloyed Steels; Tensile Strength ≤ 800 N/mm²	Aluminium Alloys, Copper Alloys
Coolant	Cutting Oil or Emulsion	Cutting Oil or Emulsion
Cutting Speed v_c	20 - 30 m/min	30 - 40 m/min

d_1	P (mm)	l_1	l_2	d_2	□	* øD_1
M 8	x 1	90	15	6	4,9	7,50
M 10	x 1	90	18	7	5,5	9,50
M 10	x 1,25	100	18	7	5,5	9,40
M 12	x 1	100	18	9	7	11,50
M 12	x 1,5	100	18	9	7	11,25
M 14	x 1,5	100	18	11	9	13,25
M 16	x 1,5	100	18	12	9	15,25

* The recommended core hole diameters are for reference purpose only.

Contents

HSSE DIN 5156 **G**

Version	Form C, 2 - 3 Threads Chamfer, with Oil Flutes	
Type of Hole		
Surface Treatment	TiN-Coating	
Catalogue-No.	6060/80	
Tolerance		
	Formex TiN 	
Application add. see Page 16,17	Unalloyed Steels; Tensile Strength ≤ 800 N/mm²	
Coolant	Cutting Oil or Emulsion	
Cutting Speed v_c	20 - 30 m/min	

d_1	P (mm)	l_1	l_2	d_2	□	* ⌀D₁
G 1/8	28	90	16	7	5,5	9,30
G 1/4	19	100	18	11	9	12,50
G 3/8	19	100	18	12	9	16,00
G 1/2	14	125	24	16	12	20,00
G 3/4	14	140	28	20	16	25,50
G 1	11	160	28	25	20	32,00

* The recommended core hole diameters are for reference purpose only.

Technical Part

Contents

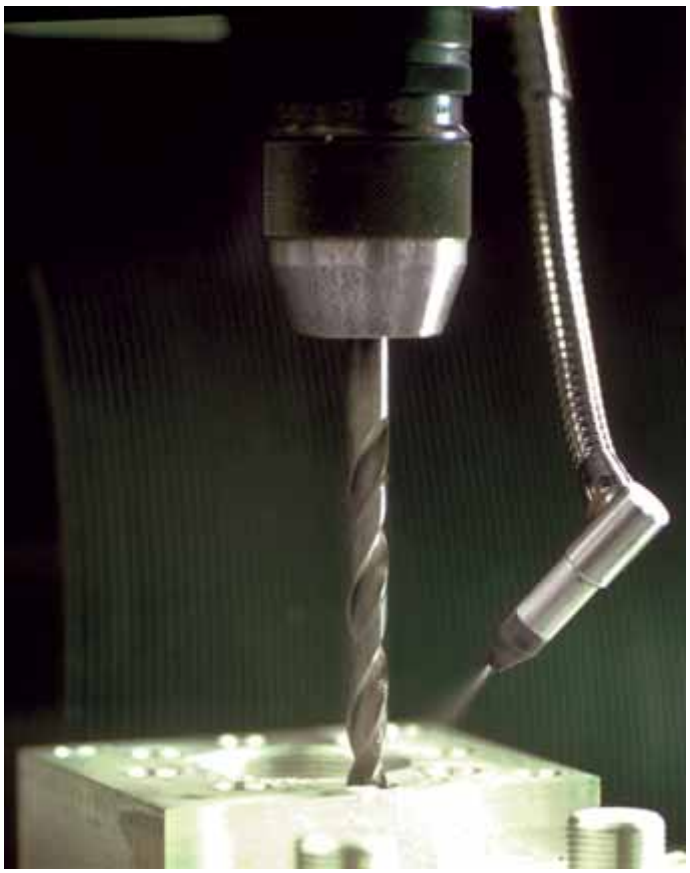
MKS = Minimum Lubrication System via 2-Phase-Technology

Maximum productivity in cutting technology stands for working up to high speeds. The resulting temperatures have to be absorbed, tool and material need to be cooled and lubricated to achieve high tool life.

The newly developed nozzle technology ensures the deep penetration of the finde-dosed coolant/lubricant into the cutting area and thus results in a high cooling and lubrication effect. The coolant/lubricant is applied via a 2-phase-nozzle. The coolant/lubricant jet is enveloped by an “air cushion” so that an unwanted mixture of liquid particles with the surrounding air is excluded.

The coolant/lubricant dismantled into microscopic particles cannot even be hurled away by high centrifugal forces (the disadvantage of full lubrication). The cooling and lubricating effect can thus be used to its full extend.

Proven Use in:
- Tapping
- Thread Rolling
- Thread Milling
- Drilling
- Reaming



Tool cooling and lubrication in an air cushion

Criteria: Cost

- Volume reduction of coolants and lubricants
- Increased tool life
- Reduced disposal and cleaning costs
- Maintenance-free

Criteria: Cooling

- Increased cooling effect
- Coolant/lubricant dismantled into microscopic particles
- Best cooling and lubricationg results

Criteria: Environmental

- Machining without tailings
- Saves costs of disposal
- Reduction of environmental load
- Eliminates health problems

Criteria: Efficiency

- Simple, clean and safe operation
- Well-dosed coolant and lubricant
- Reduced consumption due to independant regulation of air and liquid volumes
- Increased tool life

Neoboss Coatings

Advantages: • improved thread quality • precise accuracy to gauge • increased cutting speed • extended tool life	**TiN** TiN-coated Neoboss taps can be used universally.	**TiCN** Due to its high hardness and favourable viscosity TiCN-coating is recommended for difficult chipping and hard materials.	**TiAlN** Its extreme hardness and gliding quality guarantees high wear resistance against abrasive materials such as cast iron and Aluminium alloys. Its high ductility as well as thermal and chemical stability is extremly well suited for dry cutting and high speed cutting.	**CrN** This chrome nitride-coating with its high adhesive strength and excellent chemical durability is extremely well suited for thread rolling in Aluminium.	**DLC** With its highwear resistance and slight adhesion on nonferrous metals DLC-coating is perfectly recommended for cutting Aluminium and Aluminium alloys.
Micro Hard. (HV 0,05)	**2300**	**3000**	**3300**	**1750**	**2800**
Colour of Coating	**gold**	**blue-grey**	**purple - dark grey**	**silver-grey**	**black**
max. Working Temperature	**600 ° C**	**400 ° C**	**900 ° C**	**700 ° C**	**900 ° C**
Application	universal	difficult chipping materials	abrasive material, dry cutting / MKS	Rolling of Aluminium	Aluminium, Aluminium alloys

Recommended Core Hole Diameters for Taps

M Metric ISO Standard Thread DIN 13

Nom.-Ø mm		Pitch mm	Core Hole-Ø mm
M 1	x	0,25	0,75
M 1,1	x	0,25	0,85
M 1,2	x	0,25	0,95
M 1,4	x	0,30	1,10
M 1,6	x	0,35	1,25
M 1,7	x	0,35	1,35
M 1,8	x	0,35	1,45
M 2	x	0,40	1,60
M 2,2	x	0,45	1,75
M 2,3	x	0,40	1,90
M 2,5	x	0,45	2,05
M 2,6	x	0,45	2,15
M 3	x	0,50	2,50
M 3,5	x	0,60	2,90
M 4	x	0,70	3,30
M 4,5	x	0,75	3,70
M 5	x	0,80	4,20
M 5,5	x	0,90	4,60
M 6	x	1,00	5,00
M 7	x	1,00	6,00
M 8	x	1,25	6,80
M 9	x	1,25	7,80
M 10	x	1,50	8,50
M 11	x	1,50	9,50
M 12	x	1,75	10,20
M 14	x	2,00	12,00
M 16	x	2,00	14,00
M 18	x	2,50	15,50
M 20	x	2,50	17,50
M 22	x	2,50	19,50
M 24	x	3,00	21,00
M 27	x	3,00	24,00
M 30	x	3,50	26,50
M 33	x	3,50	29,50
M 36	x	4,00	32,00
M 39	x	4,00	35,00
M 42	x	4,50	37,50
M 45	x	4,50	40,50
M 48	x	5,00	43,00
M 52	x	5,00	47,00

MF Metric ISO Fine Thread DIN 13

Nom.-Ø mm		Pitch mm	Core Hole-Ø mm
M 2,5	x	0,35	2,15
M 2,6	x	0,35	2,25
M 3	x	0,35	2,65
M 3,5	x	0,35	3,15
M 4	x	0,35	3,65
M 4	x	0,50	3,50
M 4,5	x	0,50	4,00
M 5	x	0,50	4,50
M 6	x	0,50	5,50
M 6	x	0,75	5,20
M 7	x	0,75	6,20
M 8	x	0,50	7,50
M 8	x	0,75	7,20
M 8	x	1,00	7,00
M 9	x	0,75	8,20
M 9	x	1,00	8,00
M 10	x	0,50	9,50
M 10	x	0,75	9,20

MF Metric ISO Fine Thread DIN 13

Nom.-Ø mm		Pitch mm	Core Hole-Ø mm
M 10	x	1,00	9,00
M 10	x	1,25	8,80
M 11	x	1,00	10,00
M 12	x	0,50	11,50
M 12	x	0,75	11,20
M 12	x	1,00	11,00
M 12	x	1,25	10,80
M 12	x	1,50	10,50
M 13	x	1,00	12,00
M 13	x	1,50	11,50
M 14	x	0,75	13,20
M 14	x	1,00	13,00
M 14	x	1,25	12,80
M 14	x	1,50	12,50
M 15	x	1,00	14,00
M 15	x	1,50	13,50
M 16	x	1,00	15,00
M 16	x	1,50	14,50
M 17	x	1,00	16,00
M 18	x	1,00	17,00
M 18	x	1,50	16,50
M 18	x	2,00	16,00
M 20	x	1,00	19,00
M 20	x	1,50	18,50
M 20	x	2,00	18,00
M 22	x	1,00	21,00
M 22	x	1,50	20,50
M 22	x	2,00	20,00
M 24	x	1,00	23,00
M 24	x	1,50	22,50
M 24	x	2,00	22,00
M 25	x	1,50	23,50
M 26	x	1,50	24,50
M 27	x	1,50	25,50
M 27	x	2,00	25,00
M 28	x	1,50	26,50
M 30	x	1,00	29,00
M 30	x	1,50	28,50
M 30	x	2,00	28,00
M 32	x	1,50	30,50
M 32	x	2,00	30,00
M 33	x	1,50	31,50
M 33	x	2,00	31,00
M 34	x	1,50	32,50
M 35	x	1,50	33,50
M 36	x	1,50	34,50
M 36	x	2,00	34,00
M 36	x	3,00	33,00
M 38	x	1,50	36,50
M 39	x	2,00	37,00
M 39	x	3,00	36,00
M 40	x	1,50	38,50
M 42	x	1,50	40,50
M 42	x	2,00	40,00
M 42	x	3,00	39,00
M 45	x	1,50	43,50
M 45	x	2,00	43,00
M 45	x	3,00	42,00
M 48	x	1,50	46,50
M 48	x	2,00	45,00
M 48	x	3,00	45,00
M 50	x	1,50	48,50
M 52	x	1,50	50,50

BSW Whitworth-Thread

Nom.-Ø inch		Pitch (Gg/1")	Core Hole-Ø mm
W 1/16	-	60	1,55
W 3/32	-	48	2,10
W 1/8	-	40	2,35
W 5/32	-	32	2,85
W 3/16	-	24	3,90
W 7/32	-	24	4,50
W 1/4	-	20	5,10
W 5/16	-	18	6,60
W 3/8	-	16	8,00
W 7/16	-	14	9,40
W 1/2	-	12	10,60
W 9/16	-	12	12,20
W 5/8	-	11	13,50
W 3/4	-	10	16,50
W 7/8	-	9	19,50
W 1	-	8	22,25
W 1 1/8	-	7	25,00
W 1 1/4	-	7	28,00
W 1 3/8	-	6	30,75
W 1 1/2	-	6	34,00
W 1 5/8	-	5	36,25
W 1 3/4	-	5	39,50
W 1 7/8	-	4 1/2	42,00
W 2	-	4 1/2	45,00

G Whitworth Pipe Thread DIN ISO 228

Nom.-Ø inch		Pitch (Gg/1")	Core Hole-Ø mm
G 1/8	-	28	8,80
G 1/4	-	19	11,80
G 3/8	-	19	15,25
G 1/2	-	14	19,00
G 5/8	-	14	21,00
G 3/4	-	14	24,50
G 7/8	-	14	28,25
G 1	-	11	30,75
G 1 1/8	-	11	35,50
G 1 1/4	-	11	39,50
G 1 3/8	-	11	41,50
G 1 1/2	-	11	45,25
G 1 3/4	-	11	51,00
G 2	-	11	57,00

Rp Whitworth Pipe Thread ISO 7/1 and DIN 2999

Nom.-Ø inch		Pitch (Gg/1")	Core Hole-Ø mm
Rp 1/8	-	28	8,55
Rp 1/4	-	19	11,40
Rp 3/8	-	19	14,90
Rp 1/2	-	14	18,60
Rp 3/4	-	14	24,10
Rp 1	-	11	30,25
Rp 1 1/2	-	11	44,75
Rp 2	-	11	56,75

Recommended Core Hole Diameters for Taps

UNC — Unifed-Coarse-Thread ANSI B1.1

Nom.-Ø inch		Pitch (Gg/1")	Core Hole-Ø mm
Nr. 1	-	64	1,55
Nr. 2	-	56	1,85
Nr. 3	-	48	2,10
Nr. 4	-	40	2,35
Nr. 5	-	40	2,65
Nr. 6	-	32	2,85
Nr. 8	-	32	3,50
Nr. 10	-	24	3,90
Nr. 12	-	24	4,50
1/4	-	20	5,10
5/16	-	18	6,60
3/8	-	16	8,00
7/16	-	14	9,40
1/2	-	13	10,80
9/16	-	12	12,20
5/8	-	11	13,50
3/4	-	10	16,50
7/8	-	9	19,50
1	-	8	22,25
1 1/8	-	7	25,00
1 1/4	-	7	28,00
1 3/8	-	6	30,75
1 1/2	-	6	34,00
1 3/4	-	5	39,50
2	-	4 1/2	45,00

UNF — Unified-Fine-Thread ANSI B 1.1

Nom.-Ø inch		Pitch mm	Core Hole-Ø mm
Nr. 0	-	80	1,25
Nr. 1	-	72	1,55
Nr. 2	-	64	1,85
Nr. 3	-	56	2,15
Nr. 4	-	48	2,40
Nr. 5	-	44	2,70
Nr. 6	-	40	2,95
Nr. 8	-	36	3,50
Nr. 10	-	32	4,10
Nr. 12	-	28	4,60
1/4	-	28	5,50
5/16	-	24	6,90
3/8	-	24	8,50
7/16	-	20	9,90
1/2	-	20	11,50
9/16	-	18	12,90
5/8	-	18	14,50
3/4	-	16	17,50
7/8	-	14	20,50
1	-	12	23,25
1 1/8	-	12	26,50
1 1/4	-	12	29,50
1 3/8	-	12	32,75
1 1/2	-	12	36,00

UNEF — Unified-Extra-Fine-Thread ANSI B 1.1

Nom.-Ø inch		Pitch (Gg/1")	Core Hole-Ø mm
1/4	-	32	5,60
5/16	-	32	7,20
3/8	-	32	8,80
7/16	-	28	10,25
1/2	-	28	11,80
9/16	-	24	13,30
5/8	-	24	14,75
3/4	-	20	17,75
7/8	-	20	21,00
1	-	20	24,25

UN — Unified-Thread, 8- and 12-Threads ANSI B 1.1

Nom.-Ø inch		Pitch (Gg/1")	Core Hole-Ø mm
1 1/8	-	8	25,50
1 1/4	-	8	28,75
1 1/2	-	8	35,00
1 3/4	-	8	41,50
2	-	8	47,75
1 3/4	-	12	42,50
2	-	12	48,75

Pg — Steel Conduit Pipe Thread DIN 40430

Nom.-Ø		Pitch (Gg/1")	Core Hole-Ø mm
Pg 7	-	20	11,35
Pg 9	-	18	13,95
Pg 11	-	18	17,35
Pg 13,5	-	18	19,15
Pg 16	-	18	21,25
Pg 21	-	16	26,95
Pg 29	-	16	35,60
Pg 36	-	16	45,60
Pg 42	-	16	52,60
Pg 48	-	16	57,90

NPSM — American Cylindrical Pipe Thread NPSM acc. to ANSI B 1.20.1

Nom.-Ø inch		Pitch (Gg/1")	Core Hole-Ø mm
1/8	-	27	9,10
1/4	-	18	12,00
3/8	-	18	15,50
1/2	-	14	19,00
3/4	-	14	24,50
1	-	11 1/2	30,50

Rd — Round Thread DIN 405

Nom.-Ø mm		Pitch (Gg/1")	Core Hole-Ø mm
Rd 8	x	10	5,90
Rd 10	x	10	7,90
Rd 12	x	10	9,90
Rd 14	x	8	11,40
Rd 16	x	8	13,50
Rd 18	x	8	15,50
Rd 20	x	8	17,50
Rd 24	x	8	21,50
Rd 28	x	8	25,50

Tr — Trapezodial DIN 103

Nom.-Ø mm		Pitch mm	Core Hole-Ø mm
Tr 10	x	2	8,20
Tr 12	x	3	9,25
Tr 14	x	3	11,25
Tr 16	x	4	12,25
Tr 18	x	4	14,25
Tr 20	x	4	16,25
Tr 22	x	5	17,25
Tr 24	x	5	19,25
Tr 26	x	5	21,25
Tr 28	x	5	23,25
Tr 30	x	6	24,25

EG-M — EG-Metric ISO Standard Thread DIN 8140 Part 2 for Thread Inserts

Nom.-Ø mm		Pitch mm	Core Hole-Ø mm
EG M 2	x	0,45	2,65
EG M 3	x	0,50	3,15
EG M 3,5	x	0,60	3,70
EG M 4	x	0,70	4,20
EG M 5	x	0,80	5,25
EG M 6	x	1,00	6,30
EG M 8	x	1,25	8,40
EG M 10	x	1,50	10,40
EG M 12	x	1,75	12,50
EG M 14	x	2,00	14,50
EG M 16	x	2,00	16,50

EG-UNC — EG-Unified-Coarse-Thread for Thread Inserts

Nenn-Ø inch		Pitch (Gg/1")	Core Hole-Ø mm
EG Nr. 4	-	40	3,10
EG Nr. 5	-	40	3,40
EG Nr. 6	-	32	3,80
EG Nr. 8	-	32	4,40
EG Nr. 10	-	24	5,20
EG Nr. 12	-	24	5,80
EG 1/4	-	20	6,70
EG 5/16	-	18	8,40
EG 3/8	-	16	10,00
EG 7/16	-	14	11,60
EG 1/2	-	13	13,30
EG 9/16	-	12	15,00
EG 5/8	-	11	16,50
EG 3/4	-	10	19,75

Recommended Core Hole Diameters for Taps

RC — Whitworth Cylindrical Pipe Thread (BSPT), acc. BS 21 and ISO 7/1, Taper 1 : 16

rough-drill cylindrically

Nom-Ø inch		Pitch (Gg/1")	Ø D_1 mm	Hole Depth mm
Rc 1/16	-	28	6,20	11,90
Rc 1/8	-	28	8,20	11,90
Rc 1/4	-	19	11,00	17,70
Rc 3/8	-	19	14,50	18,10
Rc 1/2	-	14	18,00	24,00
Rc 3/4	-	14	23,50	25,30
Rc 1	-	11	29,50	30,60

rough-drill cylindrically and grind conically with reamer

Nom-Ø inch		Pitch (Gg/1")	Ø D_2 mm	Ø D_3 mm	Hole Depth mm
Rc 1/16	-	28	6,20	6,56	11,90
Rc 1/8	-	28	8,10	8,57	11,90
Rc 1/4	-	19	10,75	11,45	17,70
Rc 3/8	-	19	14,25	14,95	18,10
Rc 1/2	-	14	17,75	18,63	24,00
Rc 3/4	-	14	23,00	24,12	25,30
Rc 1	-	11	29,00	30,29	30,60

NPT — American Taper Pipe Thread, Taper 1 : 16 acc. to ANSI B 1.20.1

rough-drill cylindrically

Nom-Ø inch		Pitch (Gg/1")	Ø D_1 mm	Hole Depth mm
1/16	-	27	6,25	12,00
1/8	-	27	8,50	12,00
1/4	-	18	11,10	17,50
3/8	-	18	14,70	17,60
1/2	-	14	18,00	22,90
3/4	-	14	23,25	23,00
1	-	11 1/2	29,25	27,40
1 1/4	-	11 1/2	38,00	28,10
1 1/2	-	11 1/2	44,25	28,40
2	-	11 1/2	56,25	28,40

rough-drill cylindrically and grind conically with reamer

Nom-Ø inch		Pitch (Gg/1")	Ø D_2 mm	Ø D_3 mm	Hole Depth mm
1/16	-	27	6,00	6,41	11,90
1/8	-	27	8,25	8,76	12,00
1/4	-	18	10,70	11,40	17,50
3/8	-	18	14,10	14,84	17,60
1/2	-	14	17,40	18,33	22,90
3/4	-	14	22,60	23,68	23,00
1	-	11 1/2	28,50	29,72	27,40
1 1/4	-	11 1/2	37,00	38,48	28,10
1 1/2	-	11 1/2	43,50	44,55	28,40
2	-	11 1/2	55,00	56,59	28,40

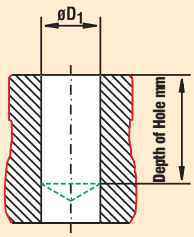
NPT — American Taper Pipe Thread, Taper 1 : 16 acc. to ANSI B 1.20.4

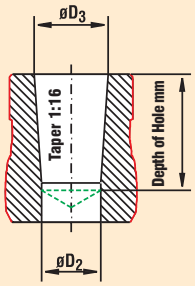
rough-drill cylindrically

Nom.-Ø inch		Pitch (Gg/1")	Ø D_1 mm	Hole Depth mm
1/16	-	27	6,15	12,00
1/8	-	27	8,40	12,00
1/4	-	18	11,00	17,50
3/8	-	18	14,50	17,60
1/2	-	14	17,75	22,90
3/4	-	14	23,00	23,00
1	-	11 1/2	29,00	27,40
1 1/4	-	11 1/2	37,50	28,10
1 1/2	-	11 1/2	44,00	28,40
2	-	11 1/2	56,00	28,40

rough-drill cylindrically and grind conically with reamer

Nom.-Ø inch		Pitch (Gg/1")	Ø D_2 mm	Ø D_3 mm	Hole Depth mm
1/16	-	27	6,00	6,41	12,00
1/8	-	27	8,25	8,76	12,00
1/4	-	18	10,70	11,40	17,50
3/8	-	18	14,10	14,84	17,60
1/2	-	14	17,40	18,33	22,90
3/4	-	14	22,60	23,68	23,00
1	-	11 1/2	28,50	29,72	27,40
1 1/4	-	11 1/2	37,00	38,48	28,10
1 1/2	-	11 1/2	43,50	44,55	28,40
2	-	11 1/2	55,00	56,59	28,40





Core Hole Diameters for Roll Taps

Please, note!
The core hole diameter has an impact on the quality of the thread.

Core hole too small:
Thread will be squeezed, danger of breaking the tool.

Core hole too wide:
No clean thread surface.

M Metric ISO Standard Thread DIN 13

Nom.-Ø mm		Pitch mm	Core Hole-Ø mm
M 1	x	0,25	0,88
M 1,2	x	0,25	1,08
M 1,4	x	0,30	1,25
M 1,6	x	0,35	1,45
M 1,7	x	0,35	1,55
M 1,8	x	0,35	1,65
M 2	x	0,40	1,80
M 2,2	x	0,45	2,00
M 2,3	x	0,40	2,10
M 2,5	x	0,45	2,30
M 2,6	x	0,45	2,40
M 3	x	0,50	2,80
M 3,5	x	0,60	3,25
M 4	x	0,70	3,70
M 5	x	0,80	4,65
M 6	x	1,00	5,55
M 8	x	1,25	7,40
M 10	x	1,50	9,30
M 12	x	1,75	11,20
M 14	x	2,00	13,10
M 16	x	2,00	15,10
M 18	x	2,50	16,90
M 20	x	2,50	18,90
M 22	x	2,50	20,90
M 24	x	3,00	22,65

MF Metric ISO Fine Thread DIN 13

Nom.-Ø mm		Pitch mm	Core Hole-Ø mm
M 4	x	0,50	3,75
M 5	x	0,50	4,75
M 6	x	0,50	5,75
M 6	x	0,75	5,65
M 8	x	0,50	7,75
M 8	x	0,75	7,65
M 8	x	1,00	7,55
M 10	x	0,75	9,65
M 10	x	1,00	9,55
M 12	x	1,00	11,55
M 12	x	1,50	11,30
M 14	x	1,00	13,55
M 14	x	1,50	13,30
M 16	x	1,00	15,55
M 16	x	1,50	15,30
M 18	x	1,00	17,55
M 18	x	1,50	17,30
M 20	x	1,50	19,30
M 20	x	2,00	19,10
M 22	x	1,50	21,30
M 22	x	2,00	21,10
M 24	x	1,50	23,30
M 24	x	2,00	23,10

UNC Unifed-Coarse-Thread ANSI B1.1

Nom.-Ø inch	Pitch mm	Core Hole-Ø mm
Nr. 2 - 56	0,454	1,95
Nr. 3 - 48	0,529	2,25
Nr. 4 - 40	0,635	2,55
Nr. 5 - 40	0,635	2,90
Nr. 6 - 32	0,794	3,15
Nr. 8 - 32	0,794	3,80
Nr. 10 - 24	1,058	4,35
Nr. 12 - 24	1,058	5,00
1/4 - 20	1,270	5,75
5/16 - 18	1,411	7,30
3/8 - 16	1,588	8,80
7/16 - 14	1,814	10,30
1/2 - 13	1,954	11,80
9/16 - 12	2,117	13,30
5/8 - 11	2,309	14,80
3/4 - 10	2,540	17,90
7/8 - 9	2,822	20,95
1 - 8	3,175	24,00

UNF Unified-Fine-Thread ANSI B 1.1

Nom.-Ø inch	Pitch mm	Core Hole-Ø mm
Nr. 2 - 64	0,397	2,00
Nr. 3 - 56	0,454	2,30
Nr. 4 - 48	0,529	2,60
Nr. 5 - 44	0,577	2,90
Nr. 6 - 40	0,635	3,20
Nr. 8 - 36	0,706	3,85
Nr. 10 - 32	0,794	4,45
Nr. 12 - 28	0,907	5,10
1/4 - 28	0,907	5,95
5/16 - 24	1,058	7,45
3/8 - 24	1,058	9,00
7/16 - 20	1,270	10,50
1/2 - 20	1,270	12,10
9/16 - 18	1,411	13,65
5/8 - 18	1,411	15,25
3/4 - 18	1,588	18,30
7/8 - 14	1,814	21,40
1 - 12	2,117	24,45

G Whitworth Pipe Thread DIN ISO 228

Nom.-Ø inch	Pitch mm	Core Hole-Ø mm
G 1/8 - 28	0,907	9,25
G 1/4 - 19	1,337	12,50
G 3/8 - 19	1,337	16,00
G 1/2 - 14	1,814	20,00
G 5/8 - 14	1,814	22,00
G 3/4 - 14	1,814	25,50
G 7/8 - 14	1,814	29,25
G 1 - 11	2,309	32,00

Recommended Cutting Speeds and RPM for Taping

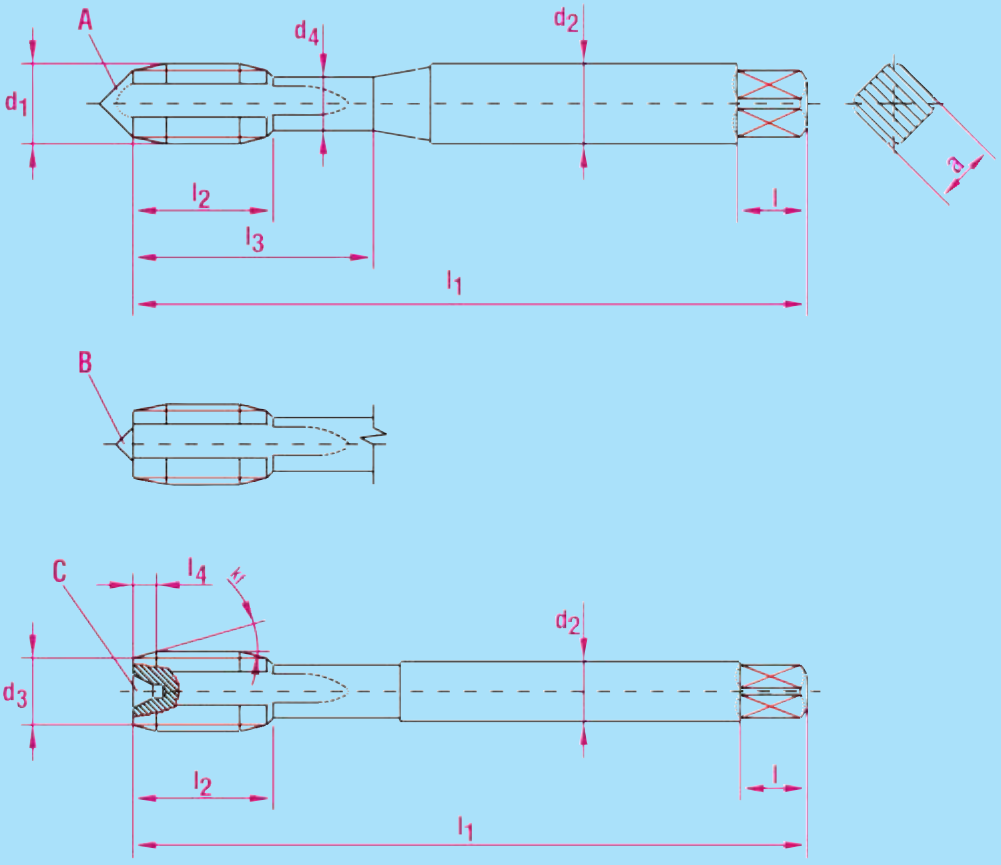
Thread	Cutting Speed v_c in m/min															RPM
Ø mm	1	2	3	4	5	6	8	10	12	15	20	25	30	40	50	60
M 1	318	637	955	1274	1592	1910	2548	3185	3822	4777	6396	7962	9554	12739	15924	19108
M 2	159	318	478	637	796	955	1274	1592	1911	2388	3185	3981	4777	6396	7962	9554
M 3	106	212	318	425	531	637	849	1062	1274	1592	2123	2654	3185	4246	5308	6369
M 4	80	159	239	318	398	478	637	796	955	1194	1592	1990	2389	3185	3981	4777
M 5	64	127	191	255	318	382	510	637	764	955	1274	1592	1911	2548	3185	3821
M 6	53	106	159	212	265	318	425	513	637	796	1062	1327	1592	2123	2653	3185
M 8	40	80	119	159	199	239	318	398	478	597	796	955	1194	1592	1990	2388
M 10	31	64	96	127	159	191	255	318	382	478	637	796	955	1274	1592	1911
M 12	26	53	80	106	133	159	212	265	318	398	531	663	796	1062	1327	1592
M 14	23	45	68	91	114	136	182	227	273	341	455	569	682	910	1137	1365
M 16	20	40	60	80	100	119	159	199	239	299	398	498	597	796	995	1194
M 18	18	35	53	71	88	106	142	177	212	265	354	442	531	708	885	1062
M 20	16	32	48	64	80	96	127	159	191	239	318	398	478	637	796	955
M 25	13	25	38	51	64	76	102	127	153	191	255	318	382	510	637	764
M 30	11	21	32	42	53	64	85	106	127	159	212	205	318	425	531	637
M 35	9	18	27	36	45	55	73	91	109	136	182	227	273	364	455	546
M 40	8	16	24	32	40	48	64	80	96	119	159	199	239	318	398	478
M 45	7	14	21	28	35	42	57	71	85	106	142	177	212	283	354	425
M 50	6	13	19	25	32	38	51	64	76	96	127	159	191	255	318	382

Formula: $RPM = \frac{\text{Cutting Speed x 1000}}{\text{Diameter x 3,14}}$ $\quad n = \frac{v_c \times 1000}{d \times \pi} = RPM$ $\quad$ oder $v_c = \frac{d \times \pi \times n}{1000} = m/min$

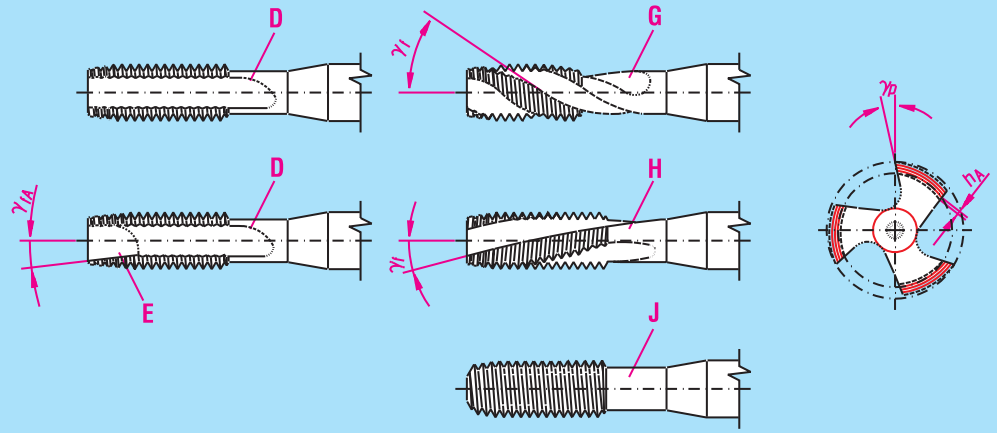
Taps - Technical Vocabulary

Letters of Dimensions Abbreviations

A = External Center
B = Reduced External Center
C = Internal Center
d_1 = Major Diameter of Tap
d_2 = Shank Diameter of Tap
d_3 = Chamfer Diameter
d_4 = Neck Diameter
l_1 = Total Length
l_2 = Thread Length
l_3 = Usable Length
l_4 = Square Size
a = Square Size
l = Square Length
K_f = Chamfer Angle



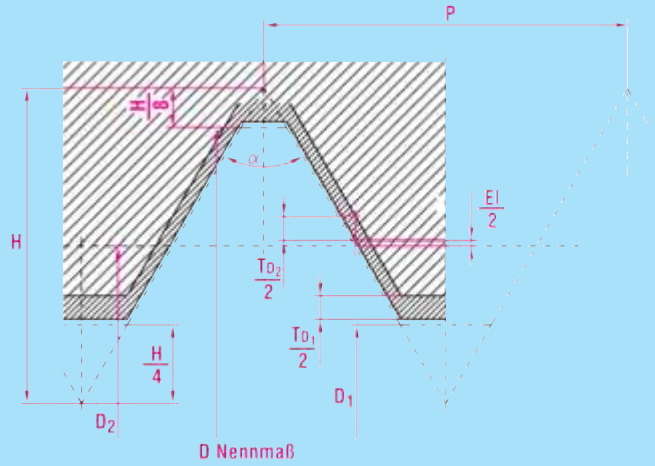
D = Straight Flutes
E = Spiral Point
G = Right Hand Spiral
H = Left Hand Spiral
J = Roll Tap
γ = Chip Angle, Side
γ_{fA} = Angle of Spiral Point
γ_p = Chip Angle
h_a = Chamfer Relief



Tap Tolerances (Thread Portion of Taps)

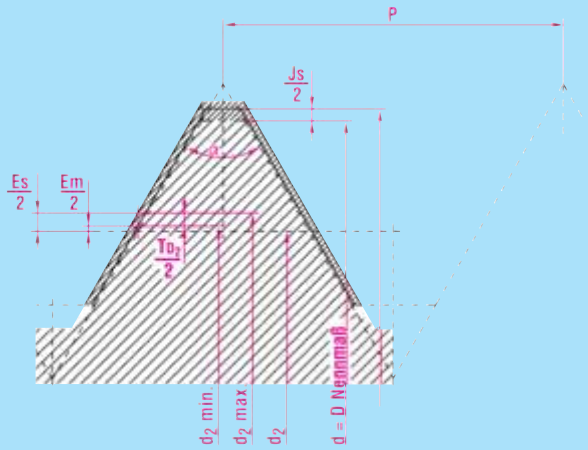
Extracted from DIN EN 22 857

Female Thread Profile



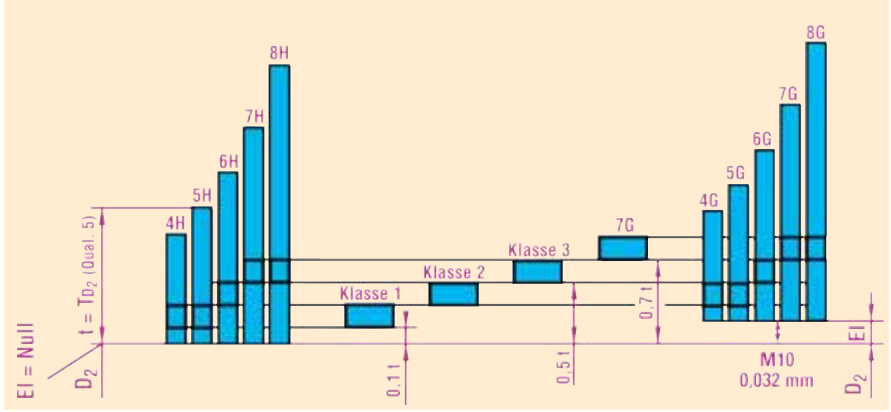
E1 = Theoretical Size
D = Nominal Diameter
D_1 = Nominal Core Diameter
D_2 = Flank Diameter
H = Triangular Height
P = Pitch
T_{D_1} = Tolerance of Core Hole Diameter
T_{D_2} = Tolerance of Flank Diameter
T_{D_2} = Tolerance Class 5 of Female Thread
Tolerance of Flank Diameter acc. to Class 5
a = Thread Angle

Profile of Tap



d-D = Nominal Diameter
d_{min} = Minimum Outside Diameter
$d_2 = D_2$ = Flank Diameter
d_2 max. = Maximum Flank Diameter
d_2 min. = Minimum Flank Diameter
Em = Minimum Flank Diameter
Es = Maximum Flank Diameter
Js = Minimum Outside Diameter
P = Pitch
$t\text{-}T_{D_2}$ = Tolerance Class 5 of Female Thread
Unit of Tolerance
T_{d_2} = Tolerance of the Flank Diameter

	Female Thread Tol. Position H	Tap Tolerance Class	Female Thread Tol. Position G

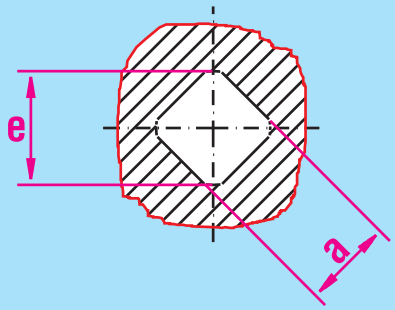


Tolerance Class of Tap		Area of Tolerance of Thread to be Cut				
Acording to						
DIN	ISO					
4H	ISO 1	4H	5H	–	–	–
6H	ISO 2	4G	5G	6H	–	–
6G	ISO 3	–	–	6G	7H	8H
7G	–	–	–	–	7G	8G

Squares

DIN 10 - 6.97 Tab. 1

Inner Squares



Outer Squares

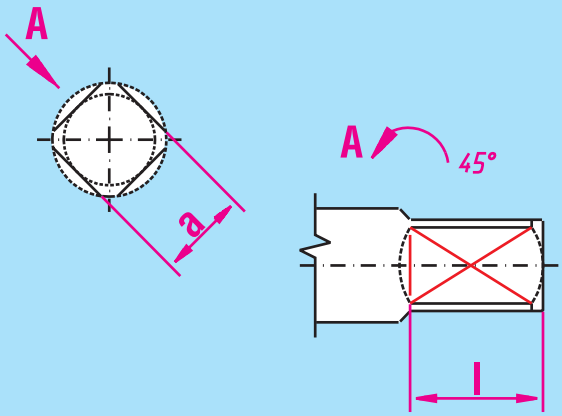


Chart 1

Description of a square with nom. dimension a = 10 mm
Square DIN 10 – 10

Dimensions in Millimeters

[1]) does not apply to tools activated by hand

Nom. Dim.	Square						Cylindrical Shaft		
	Inner Square			Outer Square			Diameters		Preferred Diameter
a	a		e	a		l	d		d
	max.	min.	min.	max.	min.	js 16 [1])	from	to	
2,1	2,260	2,120	2,89	2,100	2,010	5	2,47	2,83	2,5; 2,8
2,4	2,560	2,420	3,27	2,400	2,310	5	2,83	3,20	–
2,7	2,860	2,720	3,67	2,700	2,610	6	3,20	3,60	3,5
3,0	3,160	3,020	4,08	3,000	2,910	6	3,60	4,01	4
3,4	3,610	3,430	4,60	3,400	3,280	6	4,01	4,53	4,5
3,8	4,010	3,830	5,15	3,800	3,680	7	4,53	5,08	5
4,3	4,510	4,330	5,86	4,300	4,180	7	5,08	5,79	5,5
4,9	5,110	4,930	6,61	4,900	4,780	8	5,79	6,53	6
5,5	5,710	5,530	7,41	5,500	5,380	8	6,53	7,33	7
6,2	6,460	6,240	8,35	6,200	6,050	9	7,33	8,27	8
7	7,260	7,040	9,54	7,000	6,850	10	8,27	9,46	9
8	8,260	8,040	10,77	8,000	7,850	11	9,46	10,67	10
9	9,260	9,040	12,10	9,000	8,850	12	10,67	12,00	11; 12
10	10,260	10,040	13,43	10,000	9,850	13	12,00	13,33	–
11	11,320	11,050	14,77	11,000	10,820	14	13,33	14,67	14
12	12,320	12,050	16,10	12,000	11,820	15	14,67	16,00	16
13	13,320	13,050	17,43	13,000	12,820	16	16,00	17,33	–
14,5	14,820	14,550	19,44	14,500	14,320	17	17,33	19,33	18
16	16,320	16,050	21,44	16,000	15,820	19	19,33	21,33	20
18	18,320	18,050	24,11	18,000	17,820	21	21,33	24,00	22
20	20,395	20,065	26,78	20,000	19,790	23	24,00	26,67	25
22	22,395	22,065	29,44	22,000	21,790	25	26,67	29,33	28
24	24,395	24,065	32,12	24,000	23,790	27	29,33	32,00	32
26	26,395	26,065	34,79	26,000	25,790	29	32,00	34,67	–
29	29,395	29,065	38,79	29,000	28,790	32	34,67	38,67	36
32	32,470	32,080	42,80	32,000	31,750	35	38,67	42,67	40
35	35,470	35,080	46,80	35,000	34,750	38	42,67	46,67	45
39	39,470	39,080	52,20	39,000	38,750	42	46,67	52,06	50
44	44,470	44,080	58,81	44,000	43,750	47	52,06	58,67	56
49	49,470	49,080	65,48	49,000	48,750	52	58,67	65,33	63
55	55,560	55,100	73,48	55,000	54,700	58	65,33	73,33	70
61	61,560	61,100	81,50	61,000	60,700	64	73,33	81,33	80
68	68,560	68,100	90,83	68,000	67,700	71	81,33	90,66	90
76	76,560	76,100	101,51	76,000	75,700	79	90,66	101,33	100

Terms of Sales, Delivery and Payment

1. General
All orders hereunder are accepted subject to the following terms. Any other conditions mentioned by the customers unless expressly accepted in writing are not binding. This also applies to those cases when we did not explicitly contradict. Our terms only apply to business people and legal representatives of public law and property under public law.

2. Purchases
Purchases effected with us have to be accepted as agreed. Upon refusal of delivery we reserve the right to claim damages. In case the delivery of samples or trials preceeded the purchase in which the purchaser had the chance to convince himself of the kind of goods, quality, design and execution the purchaser cannot object to the kind of goods, quality, design and execution in any way. We reserve the right to adjust or improve our goods compared with samples sent previously or previous deliveries.

3. Cost estimates and offers
We retain the unlimited property and copyright of the use of our cost estimates, drawings and other documents; they shall not be disclosed to third parties. If the order is not placed drawings and documents have to be returned immediately.

4. Terms of Delivery
The beginning of the period of delivery set by us requires the final solution of all technical questions. Periods of delivery will be extended appropriately in case of labour disputes especially strike and lockout as well as in case of unforeseen events. This also applies when the corresponding circumstances happen to sub-suppliers. The event of such obstacles shall be reported to the customer immediately. The right to claim damages due to delay or non-compliance only applies to the customer when our delayed delivery is based on intent or gross negligence.

5. Passing of Risk and Dispatch
Incoterms apply in their latest version. If the acknowledgement does not explicitly mention another clause of the Incoterms, clause EXW (the works acknowledging the order) shall apply.

6. Complaints
Complaints and other objections regarding obvious defects have to be raised in writing immediately, 10 days after receipt of the goods at the latest, hidden defects immediately as well, however, 10 days after their discovery at the latest and no later than 6 months after receipt of the goods. Upon expiration of the a. m. deadline warranty claims of any kind are not possible.

7. Warranty
In general the obligation to examine and reproach according to §§377, 378 HGB (German Commercial Law) applies. As far as a defect of the purchased goods appears we have the right and it is our choice either to repair or exchange the goods. If we are not willing or not in the position to repair/exchange, or if this exceeds an appropriate timeframe based on reasons which we have to justify, or if we fail to repair/exchange in any other way, the customer has the right to decide whether to withdraw from the contract or ask for a corresponding reduction of the purchase price. We have the option to try a repair twice before the customer may use the a.m. rights. As far as there is no contradiction in the subsequent paragraphs, further claims no matter of which legal base are excluded. We are therefore not liable for damages which we did not occur on the purchased goods themselves, especially we are not liable for missed profit or any other damage to the property of the customer. The a.m. exclusion of liability does not apply if the cause of damage is intent or gross negligence. Furthermore it does not apply if the customer enforces damage claims based on §§ 463, 480 section 2 BGB (German Civil Law) for non-performance due to lack of a confirmed feature. As far as we negligently fail to meet an essential duty of the contract our liability to pay damages on goods or people is limited to the amount covered by our product liability insurance. We are prepared to show our policy to the customer on request. The warranty period is 6 months effective with the transfer of risk except if we have agreed to longer warranty periods in the individual contract. Our warranty periods are prescription periods and also apply to claims for damages as a result of defects if no claims based on tortuous act are put forward.

8. Delivery and Price
We generally dispatch from our respective works according to Incoterms “EXW”, ex works, including packing if no other agreement has been made. The value added tax with its official value at the time invoicing shall be added to the price. Partial shipments are permitted. In case of special manufacture we have the right to ship plus/minus 10% of the ordered volume.

9. Terms of payment
Upon cash payment as well as cash payment in advance we grant a 2% cash discount. Cash discounts do not apply to payments by drafts. Drafts and cheques are only accepted if especially agreed to and for payment purposes including all collecting and discount expenses. We do not guarantee the timely presentation ad submission of the protest of a bill. If a customer is delayed interest payments for delay used in banking will be charged, however, at least 4% above the discount rate of Deutsche Bundesbank (German Federal Bank). This does not exclude the additional claim for damages due to delay. Payments have to be effected directly to us; our commercial representatives are not authorized to receive payments. Invoices concerning partial deliveries are individually due according to their date of issue. If no terms of payment have been agreed to payment within 8 days with 2% discount, 30 days net of date of invoice shall apply.

10. Compensation/Right of Retention
The retention of payments or the compensation with possible counter-claims of the customer is only allowed if the counter-claims have been accepted by us or are legally confirmed.

11. Reservation of Title
We reserve the title of the purchased goods until the final payment of all payments resulting from the business relationship with the customer. If the customer acts against the sense of the contract, especially in case of delayed payment, we have the right to take the goods back. This does not constitute our resignation from the contract unless we explicitly confirm this in writing. After taking the goods back we are free to utilize them. The proceeds from the utilization shall be credited against the customer’s liability reduced by appropriate utilization costs. A distress or other interventions of a third party shall be immediately reported in writing by the customer. If the third party is not able to reimburse our legal and extralegal costs of a claim concerning a release of our property (intervention claim according to §771 ZPO) the customer is liable for the loss. The customer has the right to resell the goods in an ordinary business relationship; he already transfers all claims amounting to the final value of the invoice (incl. Value added tax) resulting from the resale to his customers or third parties independent of the fact whether the delivered goods were resold without or after processing. The customer has the right to collect the debt after the transfer of this debt to us. This does not affect our right to collect the dept ourselves. We are obliged, though, not to collect as long as the customer meets his payment obligations, have no delayed payments, and an application for bankruptcy or settlement proceedings in not pending. If this is the case we can ask the customer to present the transferred claims and their debtors, make the necessary statements, hand over the corresponding documents and advise the debtors (third parties) of the transfer. If the goods delivered are processed to another mobile item this processing is done with us. The acquisition of property by the customer is excluded in accordance with § 950 BGB (German Civil Law). If the goods delivered are processed or mixed together with other items not belonging to us we acquire the property of the newly produced goods in relation to the value of the remaining goods at the time of manufacture. For these new goods created by the process the same applies as for goods supplied with reservations. Reservations and all other securing rights applying to us remain in existence up to the complete payment of all debts resulting from the business relationship. If these securities exceed all debts resulting from this business relationship by more than 20% we are obliged to release upon request by the customer.

12. Cession
We have the right to transfer our debts against our customers to third parties without the approval of our customers.

13. Liability
Our liability is exclusively based on these regulations. The claim for damages raised by the purchaser against us and our agents and executors for whatever legal reason, especially in case of fault when signing the contract, violation of contractual side duties and tortuous act, is excluded unless they are in result of the intent or gross negligence. The a.m. limitations of liability do not apply to claims according to §§ 1,4 of the Product Liability Law.

14. Place of Performance and Place of Jurisdiction
Place of performance are the premises of the seller. Jurisdiction is also the premises of the seller as long as the customer is a business man or legal representatives of public law and property under public law. We have the right to sue the purchaser at the court of his residence.

15. Jurisdiction
German legislation only shall apply.

16. Legality
If any of the aforementioned regulations of the contract do not become part of the contract in part or in total or if they have become or are invalid the rest of the contract shall remain in full force.

February 2011

HOW TO CHOOSE THE RIGHT TAP

Company:

Person:

Date:

Consumption / Year (in Pieces):

Type

Dimension:

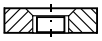
Tolerance:

Right Hand ☐ Left Hand ☐

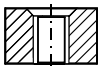
Depth of Core Hole: mm

Depth of Thread: mm

Through Hole



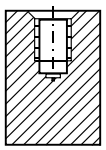
Short Thread



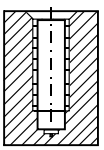
Depth of Thread up to 2-3 x d_1

☐ Please, mark ☐

Blind Hole



Depth of Thread 1,5 x d_1



Depth of Thread bis 3 x d_1

☐ Please, mark ☐

Workpiece / Material

Material Designation:

Material Number:

Hardness / Tensile Strenght:

Tool Presently Used

Application

Required / Limits to Cutting Speed:

Further Details / Problems:

Coolant: ☐ Emulsion ☐ Dry ☐ Cutting Oil ☐ MKS

Machine:

Tool Holder / Compensation Chuck:

Neoboss-Tool Recommendation

Art.-No.:

Coating:

Neoboss GmbH
Im Brühl 12
D-72406 Bisingen/Germany

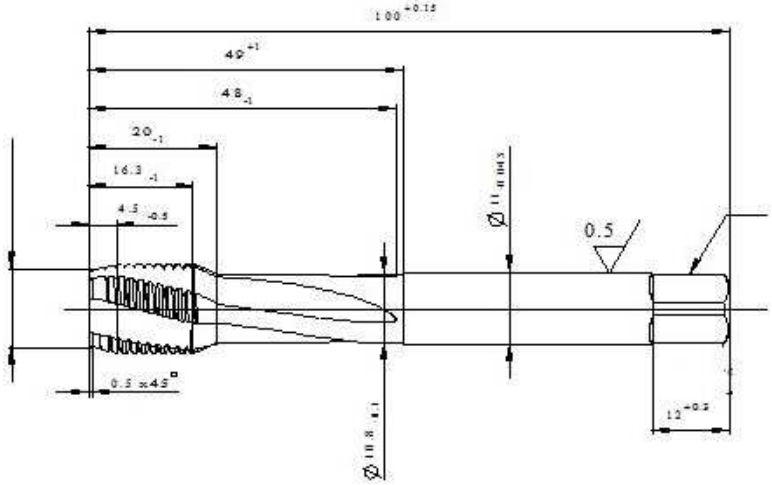
Phone +49 (0)7476 9451-0
Fax +49 (0)7476 9451-45
sales@neoboss.de
www.neoboss.de

Neoboss

www.neoboss.de

Story of success

Customer : **Audi**
Workpiece : **Wheel-hub**
Material : **38MnCr5**



Machine Condition

Kind of hole	: 5 x Through hole
Depth of thread	: 12 mm
Kind of machine	: CNC Transfer
Kind of tool holder	: Compensation chuck
Kind of coolant	: Dry cutting

Tap Design

Tap No.	: 14341B
Size	: M14x1.50 6HX
Tap material	: PM
Coating	: TIALN-GLT
Cutting speed	: 13 m/min

Results

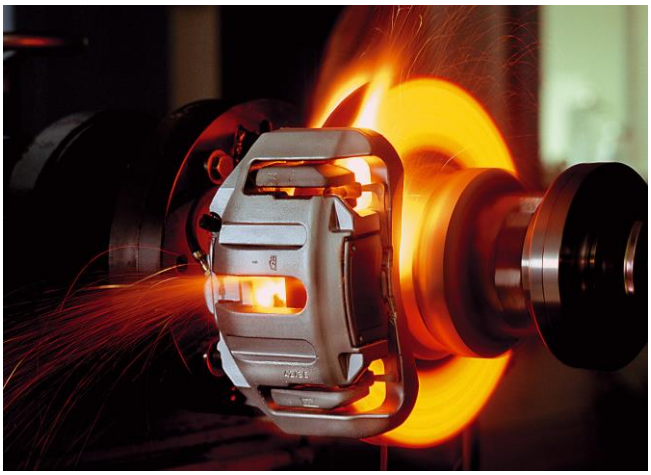
Tool life of Neoboss	: 2000 Threads	Demand	: 8000/year
Tool life of competitor	: 1000 Threads	Competitor	: BASS / FETTE

Neoboss GmbH | Im Brühl 12 72406 Bisingen/Germany | www.neoboss.de
Phone: +49 (0) 7476 9451-0 | Fax: +49 (0) 7476 9451-45 | Email: sales@neoboss.de

www.neoboss.de

Story of success - Automotive

Workpiece : **Caliper**
Material : **GGG55**



Machine Condition		Tap Design	
Kind of hole	: 2 x Through hole	Tap No.	: 11338B
Depth of thread	: 20 mm	Size	: M9x1.25 7H
Kind of machine	: CNC	Tap material	: PM
Kind of tool holder	: Synchro	Coating	: TIALN
Kind of coolant	: MQL	Cutting speed	: 50 m/min

Results

Tool life of Neoboss	: 8500 Threads	Demand	: 600 pcs /year
Tool life of competitor	: New project	Competitor	: New project

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Story of success - Automotive

Workpiece : **Turbocharger**
Material : **1.4848 (19-22% Ni; 24-27% Cr)**

Machine Condition		Tap Design	
Kind of hole	: 1 x Blind hole	Tap No.	: 4890
Depth of thread	: 24 mm	Size	: EG-M8 5H
Kind of machine	: CNC	Tap material	: PM
Kind of tool holder	: ER, Stiff chuck	Coating	: TIN
Kind of coolant	: Emulsion	Cutting speed	: 6 m/min

Results

Tool life of Neoboss	: 1000 Threads	Demand	: 1500 pcs /year
Tool life of competitor	: 250 Threads	Competitor	: Böllhoff

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Story of success - Automotive

Workpiece : **Connecting rod**
Material : **C70S6 (900-1050 N/mm²)**

Machine Condition		Tap Design	
Kind of hole	: 2 x Through hole	Tap No.	: 13033F (Formex)
Depth of thread	: 20 mm	Size	: M11x1.25 RH7
Kind of machine	: CNC	Tap material	: HSSE
Kind of tool holder	: ER Collet	Coating	: TICN
Kind of coolant	: Emulsion	Cutting speed	: 8 m/min

Results

Tool life of Neoboss	: 3000 Threads	Demand	: 1000 pcs /year
Tool life of competitor	: 2000 Threads	Competitor	: OSG

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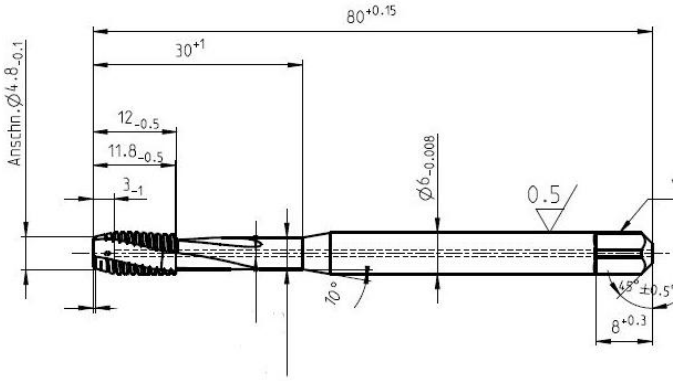
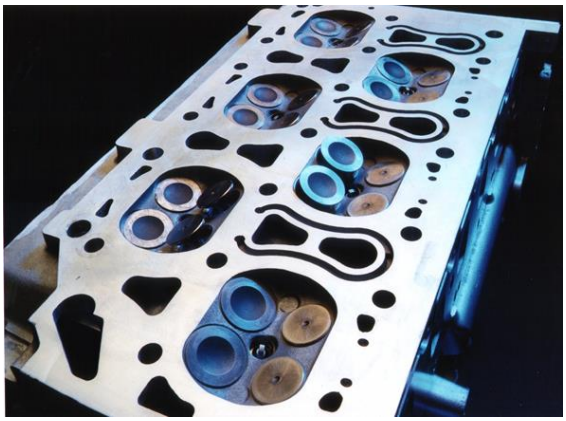
Story of success - Automotive

Workpiece : **Cylinder head**
Material : **AlSi8-9**





Machine Condition

Kind of hole	: Through hole
Depth of thread	: 13 mm
Kind of machine	: CNC Transfer
Kind of tool holder	: ER, Stiff chuck
Kind of coolant	: Emulsion

Tap Design

Tap No.	: 4555
Size	: M6 7H
Tap material	: Solid Carbide
Coating	: -
Cutting speed	: 55 m/min

Results

Tool life of Neoboss	: 60000 Threads (40000 Threads safety-change)		
Tool life of competitor	: 30000 Threads	Competitor	: Gühring
Cost reduction	: New project	Demand	: 200 pcs /year

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