

passion
for precision



Carbide drills | Thread cutting tools



2026 (2)





SUPRADRILL® CARBIDE DRILLS



-
- Universal machining of various types of steel. Safe, reliable drilling processes in steel and stainless steel
 - Comprehensive range for a broad spectrum of drilling applications. Basic range consists of 3xd IKZ, 5xd IKZ and 5xd without IKZ
 - Nano-U² high-performance coating: the outstanding performance coating for all-purpose drilling in steel
 - Greater process security, longer tool life and reduced production costs. Thanks to our in-house developed coating concepts and dimension-specific cutting edge design



THREAD MILLING



-
- High degree of process reliability when milling female threads, with milling depths of up to 3xd
 - Comprehensive range of thread milling cutters and thread whirlers for the efficient cutting of M, MF, G, UNC, UNF, NPT and NPTF threads
 - Low tool costs thanks to universal deployment in a wide variety of materials and with the same pitch
 - No jamming of the chips in the thread thanks to their short length. Cutting speed and feed rate can be selected independently of each other



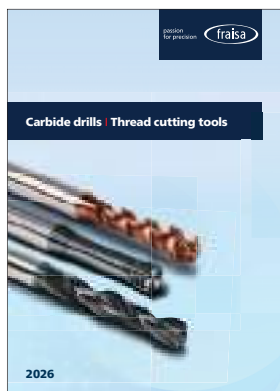
Xtap THREAD CUTTING TOOLS



-
- Lower tool costs thanks to universal tap known as “Xtap” for high-performance machining in steel and stainless steel
 - High process reliability with low torque and long tool life in through-hole and blind-hole machining applications
 - Wide range of applications and large selection of application data available to ensure perfect results
 - AlCrTiN hard coating
Greater flexibility by using one tool to machine medium-strength and stainless steel



Replaces edition 2026



Carbide drills	Drilling tools for steel, aluminium, stainless steel, titanium Spiral flute drills / Deep hole drills / Micro drills / Step drills / Center drills / Countersinks	
		13 – 149
Thread cutting tools	Thread mills M / MF / G / UNC / UNF / UN / NPT / NPTF	TM
		151 – 201
	Thread taps M / MJ / MF / G / UNC / EG M	M MF G UN EG
		203 – 301
	Cold forming taps M / MF / EG M	CF
		303 – 319
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		321 – 353
	INDEX	INDEX
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Drilling tools for steel, aluminium, stainless steel and titanium

Spiral flute drills

5xd

N° B82005 / B83005	new!	Supradrill®	HM MG10		Rm <850-1300 HRC <24-42	Inox Stainless		19
N° B62015 / B63015		Supradrill® U	HM MG10		Rm <850-1100 HRC <24-34	Inox Stainless		35
N° B62014 / B63014		Supradrill® U	HM MG10		Rm <850-1100 HRC <24-34			53
N° B72015		XD Drill®	HM MGX		Rm <850-1500 HRC <24-48			63

3xd

N° B62011 / B63011		Supradrill® U	HM MG10		Rm <850-1100 HRC <24-34	Inox Stainless		79
N° B72011		XD Drill®	HM MGX		Rm <850-1500 HRC <24-48			83
N° B52112		Supradrill® H	HM XA		HRC 48- >60			93

8xd

N° B72020		XD Drill®	HM MGX		Rm <850-1300 HRC <24-42			105
N° B52020 / B53020		Supradrill® N	HM MG10		Rm <850-1100 HRC <24-34			115

Drilling tools for steel, aluminium, stainless steel and titanium

Deep hole drills

15xd

N° B52916



HM
MGD²



Rm
<850-1100
HRC
<24-34

119

20xd

N° B52921



HM
MGD²



Rm
<850-1100
HRC
<24-34

121

25xd

N° B52926



HM
MGD²



Rm
<850-1100
HRC
<24-34

123

30xd

N° B52931



HM
MGD²



Rm
<850-1100
HRC
<24-34

125

Drilling tools for steel, aluminium, stainless steel and titanium

Micro drills

5xd							
N° B57014	Microdrill NX	HM MG10		Rm < 850-1100 HRC < 24-34			127
N° B57015	Microdrill NX	HM MG10		Rm < 850-1100 HRC < 24-34	Inox Stainless		133

8xd							
N° B57020	Microdrill NX	HM MG10		Rm < 850-1100 HRC < 24-34			137

Step drills

3xd, for core drill sizes for taps							
N° B52801		HM		Rm < 850-1100 HRC < 24-34			141



Center drills, Countersinks

Center drills						
N° B92040		HM MG10	90°	Rm < 850-1100 HRC < 24-34		143
N° B92020		HM MG10	120°	Rm < 850-1100 HRC < 24-34		145
N° B92008		HM MG10	144°	Rm < 850-1100 HRC < 24-34		147

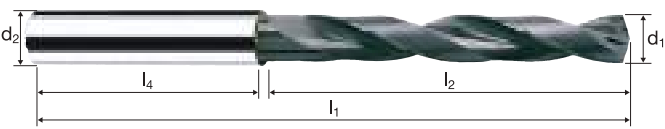
Countersinks						
N° B92312		HSS	90°	Rm < 850-1100 HRC < 24-34		149

Application	Material	d_1 [mm]	v_c [m/min]	f [mm]	n [min ⁻¹]	v_f [mm/min]	Q [cm ³ /min]
	Steel < 500 N/mm ² 	3.00	150	0.115	15915	1830	12.9
		3.20	150	0.125	14920	1865	15.0
		3.40	150	0.135	14045	1896	17.2
		3.60	150	0.145	13265	1923	19.6
		3.80	150	0.160	12565	2010	22.8
		4.00	150	0.170	11935	2029	25.5
		4.20	150	0.180	11370	2047	28.4
		4.40	150	0.190	10850	2062	31.4
		4.60	150	0.200	10380	2076	34.5
		4.60	130	0.105	13795	1448	10.2
	Steel 500 - 850 N/mm ² 	3.20	130	0.115	12930	1487	12.0
		3.40	130	0.125	12170	1521	13.8
		3.60	130	0.135	11495	1552	15.8
		3.80	130	0.145	10890	1579	17.9
		4.00	130	0.155	10345	1603	20.1
		4.20	130	0.165	9850	1625	22.5
		4.40	130	0.175	9405	1646	25.0
		4.60	130	0.185	8995	1664	27.7
		3.00	110	0.070	11670	817	5.8
		3.20	110	0.075	10940	821	6.6
	Steel 850 - 1100 N/mm ² 	3.40	110	0.080	10300	824	7.5
		3.60	110	0.085	9725	827	8.4
		3.80	110	0.090	9215	829	9.4
		4.00	110	0.095	8755	832	10.5
		4.20	110	0.100	8335	834	11.6
		4.40	110	0.105	7960	836	12.7
		4.60	110	0.110	7610	837	13.9
		3.00	70	0.060	7425	446	3.2
		3.20	70	0.065	6965	453	3.6
		3.40	70	0.065	6555	426	3.9
	Steel 1100 - 1300 N/mm ² 	3.60	70	0.070	6190	433	4.4
		3.80	70	0.075	5865	440	5.0
		4.00	70	0.075	5570	418	5.3
		4.20	70	0.080	5305	424	5.9
		4.40	70	0.085	5065	431	6.6
		4.60	70	0.085	4845	412	6.8
		3.00	40	0.045	4245	191	1.4
		3.20	40	0.050	3980	199	1.6
		3.40	40	0.050	3745	187	1.7
		3.60	40	0.055	3535	194	2.0
	Steel 1300 - 1500 N/mm ² 	3.80	40	0.055	3350	184	2.1
		4.00	40	0.060	3185	191	2.4
		4.20	40	0.060	3030	182	2.5
		4.40	40	0.065	2895	188	2.9
		4.60	40	0.065	2770	180	3.0
		3.00	60	0.050	6365	318	2.2
		3.20	60	0.060	5970	358	2.9
		3.40	60	0.060	5615	337	3.1
		3.60	60	0.065	5305	345	3.5
		3.80	60	0.070	5025	352	4.0
	Stainless steel [Cr-Ni/1.4301] 	4.00	60	0.070	4775	334	4.2
		4.20	60	0.075	4545	341	4.7
		4.40	60	0.080	4340	347	5.3
		4.60	60	0.080	4150	332	5.5
		3.00	180	0.100	19100	1910	13.5
		3.20	180	0.105	17905	1880	15.1
		3.40	180	0.115	16850	1938	17.6
		3.60	180	0.120	15915	1910	19.4
		3.80	180	0.130	15080	1960	22.2
		4.00	180	0.135	14325	1934	24.3
	Cast iron (lamellar / spheroidal) 	4.20	180	0.145	13640	1978	27.4
		4.40	180	0.150	13020	1953	29.7
		4.60	180	0.160	12455	1993	33.1
		3.00	250	0.115	26525	3050	21.6
		3.20	250	0.125	24870	3109	25.0
		3.40	250	0.135	23405	3160	28.7
		3.60	250	0.145	22105	3205	32.6
		3.80	250	0.160	20940	3350	38.0
		4.00	250	0.170	19895	3382	42.5
		4.20	250	0.180	18945	3410	47.2
	Wrought aluminium alloys Si < 6% hardened 	4.40	250	0.190	18085	3436	52.2
		4.60	250	0.200	17300	3460	57.5

Spiral flute drills Supradrill®

5xd

HM
MG10



new!

ReTool®

Rm
<850
HRC
<24

Rm
850-1100
HRC
24-34

Rm
1100-1300
HRC
34-42

Rm
1300-1500
HRC
42-48

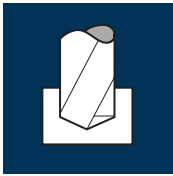
Inox
Stainless

Ti
Titanium

GG(G)
Aluminium
Tool Steel

Example: Order-N°.							NANO-U²	
Article-N°.							B82005	
ø-Code							B83005	
Ø Code	d ₁ m7	d ₂ h5	l ₁	l ₂	l ₄	L _{max}		
0300	3.00	6.0	66.0	24.7	36	20.2	●	
0305	3.05	6.0	66.0	24.8	36	20.2	●	
0310	3.10	6.0	66.0	24.8	36	20.1	●	
0315	3.15	6.0	66.0	24.8	36	20.1	●	
0320	3.20	6.0	66.0	24.8	36	20.0	●	
0330	3.30	6.0	66.0	24.9	36	19.9	●	
0340	3.40	6.0	66.0	24.9	36	19.8	●	
0350	3.50	6.0	66.0	25.0	36	19.7	●	
0360	3.60	6.0	66.0	25.0	36	19.6	●	
0370	3.70	6.0	66.0	25.1	36	19.5	●	
0375	3.75	6.0	66.0	25.1	36	19.5	●	
0380	3.80	6.0	74.0	33.1	36	27.4	●	
0385	3.85	6.0	74.0	33.2	36	27.4	●	
0390	3.90	6.0	74.0	33.2	36	27.3	●	
0400	4.00	6.0	74.0	32.9	36	26.9	●	
0410	4.10	6.0	74.0	33.0	36	26.8	●	
0420	4.20	6.0	74.0	33.1	36	26.8	●	
0430	4.30	6.0	74.0	33.2	36	26.7	●	
0440	4.40	6.0	74.0	33.3	36	26.7	●	
0445	4.45	6.0	74.0	33.3	36	26.6	●	
0450	4.50	6.0	74.0	33.3	36	26.6	●	
0460	4.60	6.0	74.0	33.4	36	26.5	●	
0465	4.65	6.0	74.0	33.5	36	26.5	●	

Application



Material

Steel
< 500 N/mm²



Steel
500 - 850 N/mm²



Steel
850 - 1100 N/mm²



Steel
1100 - 1300 N/mm²



Steel
1300 - 1500 N/mm²



Stainless steel
[Cr-Ni/1.4301]



Cast iron
(lamellar / spheroidal)



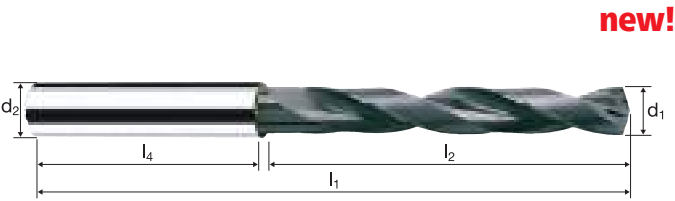
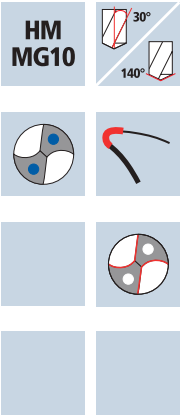
Wrought aluminium alloys
Si < 6%
hardened



d ₁ [mm]	v _c [m/min]	f [mm]	n [min ⁻¹]	v _f [mm/min]	Q [cm ³ /min]
4.70	150	0.205	10160	2083	36.1
4.90	150	0.215	9745	2095	39.5
5.10	150	0.225	9360	2106	43.0
5.30	150	0.230	9010	2072	45.7
5.50	150	0.240	8680	2083	49.5
5.70	150	0.250	8375	2094	53.4
5.90	150	0.260	8095	2105	57.6
6.10	150	0.270	7825	2113	61.8
6.30	150	0.280	7580	2122	66.1
4.70	130	0.190	8805	1673	29.0
4.90	130	0.195	8445	1647	31.1
5.10	130	0.205	8115	1664	34.0
5.30	130	0.215	7810	1679	37.0
5.50	130	0.225	7525	1693	40.2
5.70	130	0.230	7260	1670	42.6
5.90	130	0.240	7015	1684	46.0
6.10	130	0.250	6785	1696	49.6
6.30	130	0.255	6570	1675	52.2
4.70	110	0.115	7450	857	14.9
4.90	110	0.120	7145	857	16.2
5.10	110	0.125	6865	858	17.5
5.30	110	0.130	6605	859	19.0
5.50	110	0.135	6365	859	20.4
5.70	110	0.140	6145	860	21.9
5.90	110	0.145	5935	861	23.5
6.10	110	0.150	5740	861	25.2
6.30	110	0.155	5560	862	26.9
4.70	70	0.090	4740	427	7.4
4.90	70	0.090	4545	409	7.7
5.10	70	0.100	4370	437	8.9
5.30	70	0.105	4205	442	9.8
5.50	70	0.105	4050	425	10.1
5.70	70	0.110	3910	430	11.0
5.90	70	0.115	3775	434	11.9
6.10	70	0.115	3655	420	12.3
6.30	70	0.120	3535	424	13.2
4.70	40	0.070	2710	190	3.3
4.90	40	0.070	2600	182	3.4
5.10	40	0.075	2495	187	3.8
5.30	40	0.075	2400	180	4.0
5.50	40	0.085	2315	197	4.7
5.70	40	0.085	2235	190	4.8
5.90	40	0.090	2160	194	5.3
6.10	40	0.090	2085	188	5.5
6.30	40	0.095	2020	192	6.0
4.70	60	0.080	4065	325	5.6
4.90	60	0.085	3900	332	6.3
5.10	60	0.090	3745	337	6.9
5.30	60	0.090	3605	324	7.1
5.50	60	0.100	3470	347	8.2
5.70	60	0.105	3350	352	9.0
5.90	60	0.105	3235	340	9.3
6.10	60	0.110	3130	344	10.1
6.30	60	0.110	3030	333	10.4
4.70	180	0.160	12190	1950	33.8
4.90	180	0.170	11695	1988	37.5
5.10	180	0.175	11235	1966	40.2
5.30	180	0.185	10810	2000	44.1
5.50	180	0.190	10415	1979	47.0
5.70	180	0.200	10050	2010	51.3
5.90	180	0.205	9710	1991	54.4
6.10	180	0.210	9395	1973	57.7
6.30	180	0.220	9095	2001	62.4
4.70	250	0.205	16930	3471	60.2
4.90	250	0.215	16240	3492	65.9
5.10	250	0.225	15605	3511	71.7
5.30	250	0.230	15015	3453	76.2
5.50	250	0.240	14470	3473	82.5
5.70	250	0.250	13960	3490	89.1
5.90	250	0.260	13490	3507	95.9
6.10	250	0.270	13045	3522	102.9
6.30	250	0.280	12630	3536	110.2

Spiral flute drills Supradrill®

5xd



ReTool®

Rm <850 HRC <24	Rm 850-1100 HRC 24-34	Rm 1100-1300 HRC 34-42	Rm 1300-1500 HRC 42-48				Inox Stainless	Ti Titanium	GG(G) Aluminium Tool Steel
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Example: Order-N°.							Article-N°.		ø-Code		NANO-U²	
							B82005		0470		B82005	
											B83005	
Ø Code	d1 m7	d2 h5	l1	l2	l4	Lmax						
0470	4.70	6.0	74.0	33.5	36	26.5					●	
0480	4.80	6.0	82.0	41.6	36	34.4					●	
0490	4.90	6.0	82.0	41.7	36	34.3					●	
0495	4.95	6.0	82.0	41.7	36	34.3					●	
0500	5.00	6.0	82.0	41.8	36	34.3					●	
0505	5.05	6.0	82.0	42.3	36	34.7					●	
0510	5.10	6.0	82.0	42.3	36	34.7					●	
0520	5.20	6.0	82.0	42.4	36	34.6					●	
0525	5.25	6.0	82.0	42.5	36	34.6					●	
0530	5.30	6.0	82.0	42.5	36	34.6					●	
0540	5.40	6.0	82.0	42.6	36	34.5					●	
0550	5.50	6.0	82.0	42.7	36	34.5					●	
0555	5.55	6.0	82.0	42.8	36	34.4					●	
0560	5.60	6.0	82.0	42.8	36	34.4					●	
0565	5.65	6.0	82.0	42.9	36	34.4					●	
0570	5.70	6.0	82.0	42.9	36	34.4					●	
0575	5.75	6.0	82.0	43.0	36	34.4					●	
0580	5.80	6.0	82.0	43.1	36	34.4					●	
0590	5.90	6.0	82.0	43.3	36	34.4					●	
0600	6.00	6.0	82.0	43.2	36	34.2					●	
0610	6.10	8.0	91.0	50.5	36	41.3					●	
0620	6.20	8.0	91.0	50.6	36	41.3					●	
0630	6.30	8.0	91.0	50.6	36	41.2					●	

Application



Material

Steel
< 500 N/mm²



Steel
500 - 850 N/mm²



Steel
850 - 1100 N/mm²



Steel
1100 - 1300 N/mm²



Steel
1300 - 1500 N/mm²



Stainless steel
[Cr-Ni/1.4301]



Cast iron
(lamellar / spheroidal)



Wrought aluminium alloys
Si < 6%
hardened

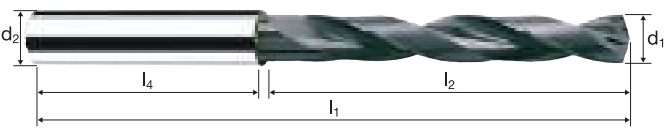


d ₁ [mm]	v _c [m/min]	f [mm]	n [min ⁻¹]	v _f [mm/min]	Q [cm ³ /min]
6.40	150	0.285	7460	2126	68.4
6.60	150	0.290	7235	2098	71.8
6.80	150	0.300	7020	2106	76.5
7.00	150	0.310	6820	2114	81.4
7.20	150	0.315	6630	2088	85.0
7.40	150	0.325	6450	2096	90.1
7.60	150	0.335	6280	2104	95.4
7.80	150	0.340	6120	2081	99.4
8.00	150	0.350	5970	2090	105.1
6.40	130	0.260	6465	1681	54.1
6.60	130	0.270	6270	1693	57.9
6.80	130	0.275	6085	1673	60.8
7.00	130	0.285	5910	1684	64.8
7.20	130	0.290	5745	1666	67.8
7.40	130	0.300	5590	1677	72.1
7.60	130	0.305	5445	1661	75.4
7.80	130	0.315	5305	1671	79.8
8.00	130	0.320	5175	1656	83.2
6.40	110	0.155	5470	848	27.3
6.60	110	0.160	5305	849	29.0
6.80	110	0.165	5150	850	30.9
7.00	110	0.170	5000	850	32.7
7.20	110	0.175	4865	851	34.6
7.40	110	0.180	4730	851	36.6
7.60	110	0.185	4605	852	38.7
7.80	110	0.190	4490	853	40.8
8.00	110	0.195	4375	853	42.9
6.40	70	0.120	3480	418	13.4
6.60	70	0.125	3375	422	14.4
6.80	70	0.130	3275	426	15.5
7.00	70	0.130	3185	414	15.9
7.20	70	0.140	3095	433	17.6
7.40	70	0.145	3010	436	18.8
7.60	70	0.145	2930	425	19.3
7.80	70	0.150	2855	428	20.5
8.00	70	0.155	2785	432	21.7
6.40	40	0.095	1990	189	6.1
6.60	40	0.100	1930	193	6.6
6.80	40	0.100	1870	187	6.8
7.00	40	0.105	1820	191	7.4
7.20	40	0.105	1770	186	7.6
7.40	40	0.110	1720	189	8.1
7.60	40	0.110	1675	184	8.3
7.80	40	0.115	1630	187	8.9
8.00	40	0.115	1590	183	9.2
6.40	60	0.115	2985	343	11.0
6.60	60	0.115	2895	333	11.4
6.80	60	0.120	2810	337	12.2
7.00	60	0.125	2730	341	13.1
7.20	60	0.125	2655	332	13.5
7.40	60	0.130	2580	335	14.4
7.60	60	0.130	2515	327	14.8
7.80	60	0.140	2450	343	16.4
8.00	60	0.145	2385	346	17.4
6.40	180	0.220	8950	1969	63.3
6.60	180	0.230	8680	1996	68.3
6.80	180	0.235	8425	1980	71.9
7.00	180	0.245	8185	2005	77.2
7.20	180	0.250	7960	1990	81.0
7.40	180	0.255	7745	1975	84.9
7.60	180	0.265	7540	1998	90.6
7.80	180	0.270	7345	1983	94.8
8.00	180	0.275	7160	1969	99.0
6.40	250	0.285	12435	3544	114.0
6.60	250	0.290	12055	3496	119.6
6.80	250	0.300	11705	3512	127.5
7.00	250	0.310	11370	3525	135.7
7.20	250	0.315	11050	3481	141.7
7.40	250	0.325	10755	3495	150.3
7.60	250	0.335	10470	3507	159.1
7.80	250	0.340	10200	3468	165.7
8.00	250	0.350	9945	3481	175.0

Spiral flute drills Supradrill®

5xd

HM
MG10



new!

ReTool®

Rm
<850
HRC
<24

Rm
850-1100
HRC
24-34

Rm
1100-1300
HRC
34-42

Rm
1300-1500
HRC
42-48

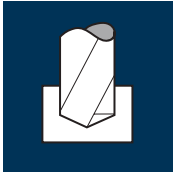
Inox
Stainless

Ti
Titanium

GG(G)
Aluminium
Tool Steel

Example: Order-N°.							NANO-U ²	
Article-N°.							B82005	
ø-Code							B83005	
Ø Code	d ₁ m7	d ₂ h5	l ₁	l ₂	l ₄	L _{max}		
0640	6.40	8.0	91.0	50.7	36	41.1	●	
0650	6.50	8.0	91.0	50.8	36	41.1	●	
0660	6.60	8.0	91.0	50.9	36	41.0	●	
0670	6.70	8.0	91.0	51.0	36	40.9	●	
0680	6.80	8.0	91.0	51.1	36	40.9	●	
0690	6.90	8.0	91.0	51.2	36	40.8	●	
0700	7.00	8.0	91.0	51.2	36	40.7	●	
0710	7.10	8.0	91.0	51.3	36	40.7	●	
0720	7.20	8.0	91.0	51.4	36	40.6	●	
0725	7.25	8.0	91.0	51.5	36	40.6	●	
0730	7.30	8.0	91.0	51.5	36	40.6	●	
0740	7.40	8.0	91.0	51.6	36	40.5	●	
0745	7.45	8.0	91.0	51.6	36	40.5	●	
0750	7.50	8.0	91.0	51.7	36	40.4	●	
0755	7.55	8.0	91.0	51.7	36	40.4	●	
0760	7.60	8.0	91.0	51.8	36	40.4	●	
0765	7.65	8.0	91.0	51.9	36	40.4	●	
0770	7.70	8.0	91.0	51.9	36	40.4	●	
0780	7.80	8.0	91.0	52.1	36	40.4	●	
0790	7.90	8.0	91.0	52.2	36	40.4	●	
0800	8.00	8.0	91.0	52.3	36	40.3	●	
0810	8.10	10.0	103.0	58.4	40	46.3	●	
0820	8.20	10.0	103.0	58.5	40	46.2	●	

Application



Material

Steel
< 500 N/mm²



Steel
500 - 850 N/mm²



Steel
850 - 1100 N/mm²



Steel
1100 - 1300 N/mm²



Steel
1300 - 1500 N/mm²



Stainless steel
[Cr-Ni/1.4301]



Cast iron
(lamellar / spheroidal)



Wrought aluminium alloys
Si < 6%
hardened

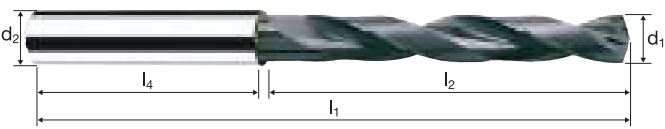


d ₁ [mm]	v _c [m/min]	f [mm]	n [min ⁻¹]	v _f [mm/min]	Q [cm ³ /min]
8.30	150	0.360	5755	2072	112.1
8.50	150	0.370	5615	2078	117.9
8.70	150	0.375	5490	2059	122.4
8.90	150	0.385	5365	2066	128.5
9.10	150	0.390	5245	2046	133.1
9.30	150	0.400	5135	2054	139.5
9.50	150	0.405	5025	2035	144.2
9.70	150	0.410	4920	2017	149.1
9.90	150	0.420	4825	2027	156.0
8.30	130	0.330	4985	1645	89.0
8.50	130	0.340	4870	1656	94.0
8.70	130	0.345	4755	1640	97.5
8.90	130	0.350	4650	1628	101.3
9.10	130	0.360	4545	1636	106.4
9.30	130	0.365	4450	1624	110.3
9.50	130	0.370	4355	1611	114.2
9.70	130	0.375	4265	1599	118.2
9.90	130	0.385	4180	1609	123.9
8.30	110	0.205	4220	865	46.8
8.50	110	0.210	4120	865	49.1
8.70	110	0.215	4025	865	51.4
8.90	110	0.215	3935	846	52.6
9.10	110	0.220	3850	847	55.1
9.30	110	0.225	3765	847	57.5
9.50	110	0.230	3685	848	60.1
9.70	110	0.235	3610	848	62.7
9.90	110	0.240	3535	848	65.3
8.30	70	0.160	2685	430	23.3
8.50	70	0.160	2620	419	23.8
8.70	70	0.165	2560	422	25.1
8.90	70	0.175	2505	438	27.2
9.10	70	0.175	2450	429	27.9
9.30	70	0.180	2395	431	29.3
9.50	70	0.185	2345	434	30.8
9.70	70	0.185	2295	425	31.4
9.90	70	0.190	2250	428	32.9
8.30	40	0.120	1535	184	10.0
8.50	40	0.125	1500	188	10.7
8.70	40	0.125	1465	183	10.9
8.90	40	0.130	1430	186	11.6
9.10	40	0.130	1400	182	11.8
9.30	40	0.140	1370	192	13.0
9.50	40	0.140	1340	188	13.3
9.70	40	0.145	1315	191	14.1
9.90	40	0.145	1285	186	14.3
8.30	60	0.150	2300	345	18.7
8.50	60	0.150	2245	337	19.1
8.70	60	0.155	2195	340	20.2
8.90	60	0.155	2145	332	20.7
9.10	60	0.160	2100	336	21.9
9.30	60	0.165	2055	339	23.0
9.50	60	0.165	2010	332	23.5
9.70	60	0.175	1970	345	25.5
9.90	60	0.175	1930	338	26.0
8.30	180	0.285	6905	1968	106.5
8.50	180	0.295	6740	1988	112.8
8.70	180	0.300	6585	1976	117.5
8.90	180	0.305	6440	1964	122.2
9.10	180	0.315	6295	1983	129.0
9.30	180	0.320	6160	1971	133.9
9.50	180	0.325	6030	1960	138.9
9.70	180	0.330	5905	1949	144.0
9.90	180	0.340	5785	1967	151.4
8.30	250	0.360	9590	3452	186.8
8.50	250	0.370	9360	3463	196.5
8.70	250	0.375	9145	3429	203.8
8.90	250	0.385	8940	3442	214.1
9.10	250	0.390	8745	3411	221.8
9.30	250	0.400	8555	3422	232.5
9.50	250	0.405	8375	3392	240.4
9.70	250	0.410	8205	3364	248.6
9.90	250	0.420	8040	3377	260.0

Spiral flute drills Supradrill®

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HM
MG10



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ReTool®

Rm
<850
HRC
<24

Rm
850-1100
HRC
24-34

Rm
1100-1300
HRC
34-42

Rm
1300-1500
HRC
42-48

Inox
Stainless

Ti
Titanium

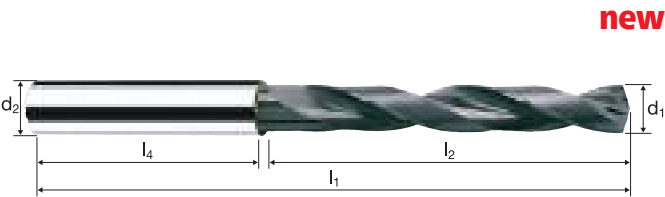
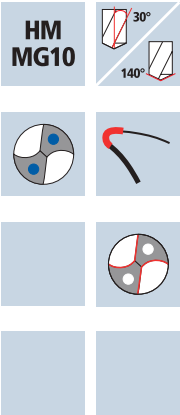
GG(G)
Aluminium
Tool Steel

Example: Order-N°.							Article-N°.		ø-Code		NANO-U²	
							B82005		0830		B82005	
											B83005	
Ø Code	d1 m7	d2 h5	l1	l2	l4	Lmax						
0830	8.30	10.0	103.0	58.6	40	46.2					●	
0840	8.40	10.0	103.0	58.7	40	46.1					●	
0850	8.50	10.0	103.0	58.8	40	46.0					●	
0860	8.60	10.0	103.0	58.9	40	46.0					●	
0870	8.70	10.0	103.0	59.0	40	45.9					●	
0875	8.75	10.0	103.0	59.0	40	45.9					●	
0880	8.80	10.0	103.0	59.1	40	45.9					●	
0885	8.85	10.0	103.0	59.1	40	45.8					●	
0890	8.90	10.0	103.0	59.1	40	45.8					●	
0900	9.00	10.0	103.0	59.2	40	45.7					●	
0910	9.10	10.0	103.0	59.3	40	45.7					●	
0920	9.20	10.0	103.0	59.4	40	45.6					●	
0925	9.25	10.0	103.0	59.4	40	45.6					●	
0930	9.30	10.0	103.0	59.5	40	45.5					●	
0940	9.40	10.0	103.0	59.6	40	45.5					●	
0950	9.50	10.0	103.0	59.7	40	45.4					●	
0955	9.55	10.0	103.0	59.7	40	45.4					●	
0960	9.60	10.0	103.0	59.8	40	45.4					●	
0965	9.65	10.0	103.0	59.8	40	45.4					●	
0970	9.70	10.0	103.0	59.9	40	45.3					●	
0980	9.80	10.0	103.0	60.0	40	45.3					●	
0990	9.90	10.0	103.0	60.2	40	45.3					●	
1000	10.00	10.0	103.0	60.2	40	45.2					●	

Application	Material	d_1 [mm]	v_c [m/min]	f [mm]	n [min ⁻¹]	v_f [mm/min]	Q [cm ³ /min]
	Steel < 500 N/mm ² 	10.20	150	0.430	4680	2012	164.4
		10.40	150	0.435	4590	1997	169.6
		10.60	150	0.440	4505	1982	174.9
		10.80	150	0.450	4420	1989	182.2
		11.00	150	0.455	4340	1975	187.7
		11.20	150	0.460	4265	1962	193.3
		11.50	150	0.470	4150	1951	202.6
		12.00	150	0.485	3980	1930	218.3
		12.30	150	0.490	3880	1901	225.9
		12.30	150	0.490	3880	1901	225.9
	Steel 500 - 850 N/mm ² 	10.20	130	0.390	4055	1581	129.2
		10.40	130	0.400	3980	1592	135.2
		10.60	130	0.405	3905	1582	139.6
		10.80	130	0.410	3830	1570	143.8
		11.00	130	0.415	3760	1560	148.3
		11.20	130	0.420	3695	1552	152.9
		11.50	130	0.430	3600	1548	160.8
		12.00	130	0.440	3450	1518	171.7
		12.30	130	0.450	3365	1514	179.9
		12.30	130	0.450	3365	1514	179.9
	Steel 850 - 1100 N/mm ² 	10.20	110	0.245	3435	842	68.8
		10.40	110	0.250	3365	841	71.4
		10.60	110	0.255	3305	843	74.4
		10.80	110	0.260	3240	842	77.1
		11.00	110	0.265	3185	844	80.2
		11.20	110	0.270	3125	844	83.2
		11.50	110	0.275	3045	837	86.9
		12.00	110	0.285	2920	832	94.1
		12.30	110	0.295	2845	839	99.7
		12.30	110	0.295	2845	839	99.7
	Steel 1100 - 1300 N/mm ² 	10.20	70	0.195	2185	426	34.8
		10.40	70	0.200	2140	428	36.4
		10.60	70	0.200	2100	420	37.1
		10.80	70	0.205	2065	423	38.8
		11.00	70	0.215	2025	435	41.3
		11.20	70	0.215	1990	428	42.2
		11.50	70	0.220	1940	427	44.4
		12.00	70	0.230	1855	427	48.3
		12.30	70	0.235	1810	425	50.5
		12.30	70	0.235	1810	425	50.5
	Steel 1300 - 1500 N/mm ² 	10.20	40	0.150	1250	188	15.4
		10.40	40	0.155	1225	190	16.1
		10.60	40	0.155	1200	186	16.4
		10.80	40	0.160	1180	189	17.3
		11.00	40	0.160	1155	185	17.6
		11.20	40	0.165	1135	187	18.4
		11.50	40	0.170	1105	188	19.5
		12.00	40	0.175	1060	186	21.0
		12.30	40	0.180	1035	186	22.1
		12.30	40	0.180	1035	186	22.1
	Stainless steel [Cr-Ni/1.4301] 	10.20	60	0.180	1870	337	27.5
		10.40	60	0.185	1835	339	28.8
		10.60	60	0.190	1800	342	30.2
		10.80	60	0.190	1770	336	30.8
		11.00	60	0.195	1735	338	32.1
		11.20	60	0.195	1705	332	32.7
		11.50	60	0.200	1660	332	34.5
		12.00	60	0.215	1590	342	38.7
		12.30	60	0.220	1555	342	40.6
		12.30	60	0.220	1555	342	40.6
	Cast iron (lamellar / spheroidal) 	10.20	180	0.345	5615	1937	158.3
		10.40	180	0.355	5510	1956	166.2
		10.60	180	0.360	5405	1946	171.7
		10.80	180	0.365	5305	1936	177.4
		11.00	180	0.370	5210	1928	183.2
		11.20	180	0.380	5115	1944	191.5
		11.50	180	0.385	4980	1917	199.1
		12.00	180	0.400	4775	1910	216.0
		12.30	180	0.410	4660	1911	227.1
		12.30	180	0.410	4660	1911	227.1
	Wrought aluminium alloys Si < 6% hardened 	10.20	250	0.430	7800	3354	274.1
		10.40	250	0.435	7650	3328	282.7
		10.60	250	0.440	7505	3302	291.4
		10.80	250	0.450	7370	3317	303.9
		11.00	250	0.455	7235	3292	312.8
		11.20	250	0.460	7105	3268	322.0
		11.50	250	0.470	6920	3252	337.8
		12.00	250	0.485	6630	3216	363.7
		12.30	250	0.490	6470	3170	376.7
		12.30	250	0.490	6470	3170	376.7

Spiral flute drills Supradrill®

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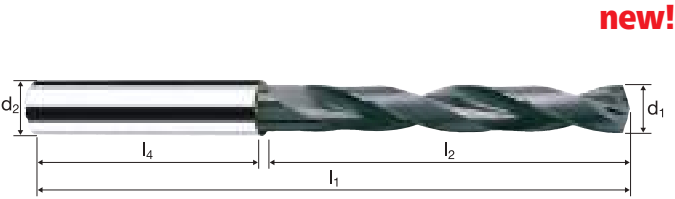
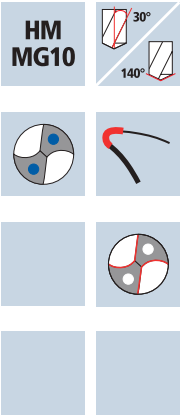
Rm <850 HRC <24	Rm 850-1100 HRC 24-34	Rm 1100-1300 HRC 34-42	Rm 1300-1500 HRC 42-48				Inox Stainless	Ti Titanium	GG(G) Aluminium Tool Steel
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Example: Order-N°.							NANO-U ²	
Article-N°. ø-Code								B82005
B82005 1010								B83005
new!								
Ø Code	d ₁ m7	d ₂ h5	l ₁	l ₂	l ₄	L _{max}		
1010	10.10	12.0	118.0	68.4	45	53.3		●
1020	10.20	12.0	118.0	68.5	45	53.2		●
1030	10.30	12.0	118.0	68.6	45	53.2		●
1040	10.40	12.0	118.0	68.7	45	53.1		●
1050	10.50	12.0	118.0	68.8	45	53.0		●
1060	10.60	12.0	118.0	68.9	45	53.0		●
1070	10.70	12.0	118.0	69.0	45	52.9		●
1080	10.80	12.0	118.0	69.0	45	52.8		●
1090	10.90	12.0	118.0	69.1	45	52.8		●
1100	11.00	12.0	118.0	69.2	45	52.7		●
1110	11.10	12.0	118.0	69.3	45	52.6		●
1120	11.20	12.0	118.0	69.4	45	52.6		●
1130	11.30	12.0	118.0	69.5	45	52.5		●
1140	11.40	12.0	118.0	69.6	45	52.5		●
1150	11.50	12.0	118.0	69.7	45	52.4		●
1160	11.60	12.0	118.0	69.8	45	52.4		●
1170	11.70	12.0	118.0	69.9	45	52.3		●
1180	11.80	12.0	118.0	70.0	45	52.3		●
1190	11.90	12.0	118.0	70.2	45	52.3		●
1200	12.00	12.0	118.0	70.2	45	52.2		●
1210	12.10	14.0	124.0	74.4	45	56.3		●
1220	12.20	14.0	124.0	74.5	45	56.2		●
1230	12.30	14.0	124.0	74.6	45	56.1		●

Application	Material	d_1 [mm]	v_c [m/min]	f [mm]	n [min ⁻¹]	v_f [mm/min]	Q [cm ³ /min]
	Steel < 500 N/mm ² 	12.40	150	0.495	3850	1906	230.2
		12.70	150	0.500	3760	1880	238.2
		13.00	150	0.510	3675	1874	248.7
		13.30	150	0.515	3590	1849	256.9
		13.50	150	0.520	3535	1838	263.1
		13.70	150	0.525	3485	1830	269.8
		14.00	150	0.530	3410	1807	278.2
		14.30	150	0.535	3340	1787	287.0
		14.60	150	0.545	3270	1782	298.3
		14.60	150	0.545	3270	1782	298.3
	Steel 500 - 850 N/mm ² 	12.40	130	0.450	3335	1501	181.3
		12.70	130	0.455	3260	1483	187.9
		13.00	130	0.465	3185	1481	196.6
		13.30	130	0.470	3110	1462	203.1
		13.50	130	0.475	3065	1456	208.4
		13.70	130	0.480	3020	1450	213.7
		14.00	130	0.485	2955	1433	220.6
		14.30	130	0.490	2895	1419	227.9
		14.60	130	0.495	2835	1403	234.9
		14.60	130	0.495	2835	1403	234.9
	Steel 850 - 1100 N/mm ² 	12.40	110	0.295	2825	833	100.6
		12.70	110	0.300	2755	827	104.8
		13.00	110	0.310	2695	835	110.8
		13.30	110	0.315	2635	830	115.3
		13.50	110	0.320	2595	830	118.8
		13.70	110	0.320	2555	818	120.6
		14.00	110	0.330	2500	825	127.0
		14.30	110	0.335	2450	821	131.9
		14.60	110	0.340	2400	816	136.6
		14.60	110	0.340	2400	816	136.6
	Steel 1100 - 1300 N/mm ² 	12.40	70	0.235	1795	422	51.0
		12.70	70	0.240	1755	421	53.3
		13.00	70	0.245	1715	420	55.7
		13.30	70	0.255	1675	427	59.3
		13.50	70	0.260	1650	429	61.4
		13.70	70	0.265	1625	431	63.5
		14.00	70	0.270	1590	429	66.0
		14.30	70	0.275	1560	429	68.9
		14.60	70	0.280	1525	427	71.5
		14.60	70	0.280	1525	427	71.5
	Steel 1300 - 1500 N/mm ² 	12.40	40	0.180	1025	185	22.3
		12.70	40	0.185	1005	186	23.6
		13.00	40	0.195	980	191	25.4
		13.30	40	0.195	955	186	25.8
		13.50	40	0.200	945	189	27.1
		13.70	40	0.205	930	191	28.2
		14.00	40	0.205	910	187	28.8
		14.30	40	0.210	890	187	30.0
		14.60	40	0.215	870	187	31.3
		14.60	40	0.215	870	187	31.3
	Stainless steel [Cr-Ni/1.4301] 	12.40	60	0.220	1540	339	40.9
		12.70	60	0.225	1505	339	42.9
		13.00	60	0.230	1470	338	44.9
		13.30	60	0.235	1435	337	46.8
		13.50	60	0.240	1415	340	48.7
		13.70	60	0.240	1395	335	49.4
		14.00	60	0.245	1365	334	51.4
		14.30	60	0.255	1335	340	54.6
		14.60	60	0.260	1310	341	57.1
		14.60	60	0.260	1310	341	57.1
	Cast iron (lamellar / spheroidal) 	12.40	180	0.415	4620	1917	231.5
		12.70	180	0.420	4510	1894	239.9
		13.00	180	0.430	4405	1894	251.4
		13.30	180	0.440	4310	1896	263.4
		13.50	180	0.445	4245	1889	270.4
		13.70	180	0.450	4180	1881	277.3
		14.00	180	0.460	4095	1884	290.0
		14.30	180	0.465	4005	1862	299.0
		14.60	180	0.475	3925	1864	312.1
		14.60	180	0.475	3925	1864	312.1
	Wrought aluminium alloys Si < 6% hardened 	12.40	250	0.495	6420	3178	383.8
		12.70	250	0.500	6265	3133	396.9
		13.00	250	0.510	6120	3121	414.3
		13.30	250	0.515	5985	3082	428.2
		13.50	250	0.520	5895	3065	438.7
		13.70	250	0.525	5810	3050	449.6
		14.00	250	0.530	5685	3013	463.8
		14.30	250	0.535	5565	2977	478.1
		14.60	250	0.545	5450	2970	497.2
		14.60	250	0.545	5450	2970	497.2

Spiral flute drills Supradrill®

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Rm <850 HRC <24	Rm 850-1100 HRC 24-34	Rm 1100-1300 HRC 34-42	Rm 1300-1500 HRC 42-48				Inox Stainless	Ti Titanium	GG(G) Aluminium Tool Steel
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Example: Order-N°.							Article-N°.		ø-Code		NANO-U²	
							B82005		1240		B82005	
											B83005	
Ø Code	d1 m7	d2 h5	L1	L2	L4	Lmax						
1240	12.40	14.0	124.0	74.7	45	56.1					●	
1250	12.50	14.0	124.0	74.8	45	56.0					●	
1260	12.60	14.0	124.0	74.9	45	56.0					●	
1270	12.70	14.0	124.0	74.9	45	55.9					●	
1280	12.80	14.0	124.0	75.0	45	55.8					●	
1290	12.90	14.0	124.0	75.1	45	55.8					●	
1300	13.00	14.0	124.0	75.2	45	55.7					●	
1310	13.10	14.0	124.0	75.3	45	55.6					●	
1320	13.20	14.0	124.0	75.4	45	55.6					●	
1330	13.30	14.0	124.0	75.5	45	55.5					●	
1340	13.40	14.0	124.0	75.5	45	55.4					●	
1350	13.50	14.0	124.0	75.6	45	55.4					●	
1360	13.60	14.0	124.0	75.7	45	55.3					●	
1370	13.70	14.0	124.0	75.9	45	55.3					●	
1380	13.80	14.0	124.0	76.0	45	55.3					●	
1390	13.90	14.0	124.0	76.1	45	55.3					●	
1400	14.00	14.0	124.0	76.2	45	55.2					●	
1410	14.10	16.0	133.0	80.4	48	59.3					●	
1420	14.20	16.0	133.0	80.5	48	59.2					●	
1430	14.30	16.0	133.0	80.6	48	59.1					●	
1440	14.40	16.0	133.0	80.7	48	59.1					●	
1450	14.50	16.0	133.0	80.8	48	59.0					●	
1460	14.60	16.0	133.0	80.8	48	58.9					●	

Application	Material	d_1 [mm]	v_c [m/min]	f [mm]	n [min ⁻¹]	v_f [mm/min]	Q [cm ³ /min]
	Steel < 500 N/mm ² 	14.70	150	0.545	3250	1771	300.6
		15.00	150	0.550	3185	1752	309.6
		15.25	150	0.555	3130	1737	317.3
		15.50	150	0.560	3080	1725	325.5
		15.70	150	0.565	3040	1718	332.6
		16.00	150	0.570	2985	1701	342.0
		16.30	150	0.570	2930	1670	348.5
		16.60	150	0.575	2875	1653	357.7
		16.80	150	0.580	2840	1647	365.1
		16.80	150	0.580	2840	1647	365.1
	Steel 500 - 850 N/mm ²	14.70	130	0.495	2815	1393	236.4
		15.00	130	0.500	2760	1380	243.9
		15.25	130	0.505	2715	1371	250.4
		15.50	130	0.510	2670	1362	257.0
		15.70	130	0.510	2635	1344	260.2
		16.00	130	0.515	2585	1331	267.6
		16.30	130	0.520	2540	1321	275.7
		16.60	130	0.525	2495	1310	283.5
		16.80	130	0.525	2465	1294	286.8
		16.80	130	0.525	2465	1294	286.8
	Steel 850 - 1100 N/mm ²	14.70	110	0.340	2380	809	137.3
		15.00	110	0.350	2335	817	144.4
		15.25	110	0.355	2295	815	148.9
		15.50	110	0.360	2260	814	153.6
		15.70	110	0.360	2230	803	155.5
		16.00	110	0.365	2190	799	160.6
		16.30	110	0.375	2150	806	168.2
		16.60	110	0.380	2110	802	173.6
		16.80	110	0.380	2085	792	175.6
		16.80	110	0.380	2085	792	175.6
	Steel 1100 - 1300 N/mm ²	14.70	70	0.280	1515	424	72.0
		15.00	70	0.285	1485	423	74.8
		15.25	70	0.295	1460	431	78.7
		15.50	70	0.300	1440	432	81.5
		15.70	70	0.300	1420	426	82.5
		16.00	70	0.305	1395	425	85.5
		16.30	70	0.310	1365	423	88.3
		16.60	70	0.315	1340	422	91.3
		16.80	70	0.320	1325	424	94.0
		16.80	70	0.320	1325	424	94.0
	Steel 1300 - 1500 N/mm ²	14.70	40	0.215	865	186	31.6
		15.00	40	0.220	850	187	33.0
		15.25	40	0.225	835	188	34.3
		15.50	40	0.225	820	185	34.9
		15.70	40	0.230	810	186	36.0
		16.00	40	0.235	795	187	37.6
		16.30	40	0.235	780	183	38.2
		16.60	40	0.240	765	184	39.8
		16.80	40	0.250	760	190	42.1
		16.80	40	0.250	760	190	42.1
	Stainless steel [Cr-Ni/1.4301]	14.70	60	0.260	1300	338	57.4
		15.00	60	0.265	1275	338	59.7
		15.25	60	0.270	1250	338	61.7
		15.50	60	0.275	1230	338	63.8
		15.70	60	0.275	1215	334	64.7
		16.00	60	0.280	1195	335	67.4
		16.30	60	0.285	1170	333	69.5
		16.60	60	0.295	1150	339	73.4
		16.80	60	0.300	1135	341	75.6
		16.80	60	0.300	1135	341	75.6
	Cast iron (lamellar / spheroidal)	14.70	180	0.475	3900	1853	314.5
		15.00	180	0.485	3820	1853	327.5
		15.25	180	0.490	3755	1840	336.1
		15.50	180	0.500	3695	1848	348.7
		15.70	180	0.505	3650	1843	356.8
		16.00	180	0.510	3580	1826	367.1
		16.30	180	0.520	3515	1828	381.5
		16.60	180	0.525	3450	1811	391.9
		16.80	180	0.530	3410	1807	400.6
		16.80	180	0.530	3410	1807	400.6
	Wrought aluminium alloys Si < 6% hardened	14.70	250	0.545	5415	2951	500.8
		15.00	250	0.550	5305	2918	515.7
		15.25	250	0.555	5220	2897	529.1
		15.50	250	0.560	5135	2876	542.7
		15.70	250	0.565	5070	2865	554.6
		16.00	250	0.570	4975	2836	570.2
		16.30	250	0.570	4880	2782	580.5
		16.60	250	0.575	4795	2757	596.7
		16.80	250	0.580	4735	2746	608.7
		16.80	250	0.580	4735	2746	608.7

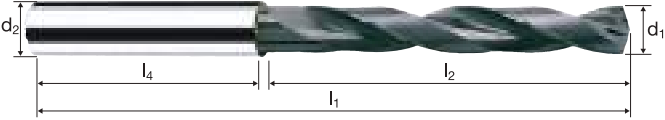
Spiral flute drills Supradrill®

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HM
MG10



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ReTool®

Rm
<850
HRC
<24

Rm
850-1100
HRC
24-34

Rm
1100-1300
HRC
34-42

Rm
1300-1500
HRC
42-48

Inox
Stainless

Ti
Titanium

GG(G)
Aluminium
Tool Steel

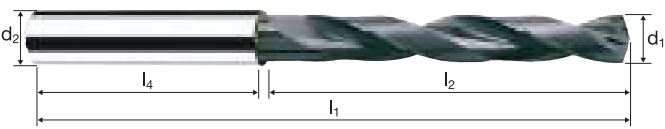
Example: Order-N°.							NANO-U ²	
Article-N°.							B82005	
ø-Code							B83005	
Ø Code	d ₁ m7	d ₂ h5	l ₁	l ₂	l ₄	L _{max}		
1470	14.70	16.0	133.0	80.9	48	58.9	●	
1480	14.80	16.0	133.0	81.0	48	58.8	●	
1490	14.90	16.0	133.0	81.1	48	58.8	●	
1500	15.00	16.0	133.0	81.2	48	58.7	●	
1510	15.10	16.0	133.0	81.3	48	58.6	●	
1520	15.20	16.0	133.0	81.4	48	58.6	●	
1525	15.25	16.0	133.0	81.4	48	58.5	●	
1530	15.30	16.0	133.0	81.4	48	58.5	●	
1540	15.40	16.0	133.0	81.5	48	58.4	●	
1550	15.50	16.0	133.0	81.6	48	58.4	●	
1560	15.60	16.0	133.0	81.7	48	58.3	●	
1570	15.70	16.0	133.0	81.8	48	58.3	●	
1580	15.80	16.0	133.0	82.0	48	58.3	●	
1590	15.90	16.0	133.0	82.1	48	58.3	●	
1600	16.00	16.0	133.0	82.2	48	58.2	●	
1610	16.10	18.0	143.0	90.4	48	66.2	●	
1620	16.20	18.0	143.0	90.5	48	66.2	●	
1630	16.30	18.0	143.0	90.6	48	66.1	●	
1640	16.40	18.0	143.0	90.7	48	66.1	●	
1650	16.50	18.0	143.0	90.7	48	66.0	●	
1660	16.60	18.0	143.0	90.8	48	65.9	●	
1670	16.70	18.0	143.0	90.9	48	65.9	●	
1680	16.80	18.0	143.0	91.0	48	65.8	●	

Application	Material	d_1 [mm]	v_c [m/min]	f [mm]	n [min ⁻¹]	v_f [mm/min]	Q [cm ³ /min]
	Steel < 500 N/mm ² 	16.90	150	0.580	2825	1639	367.7
		17.20	150	0.585	2775	1623	377.1
		17.50	150	0.585	2730	1597	384.1
		17.70	150	0.590	2700	1593	392.0
		18.00	150	0.590	2655	1566	398.5
		18.50	150	0.595	2580	1535	412.6
		19.00	150	0.600	2515	1509	427.8
		19.50	150	0.605	2450	1482	442.6
		20.00	150	0.605	2385	1443	453.3
	Steel 500 - 850 N/mm ² 	16.90	130	0.525	2450	1286	288.5
		17.20	130	0.530	2405	1275	296.2
		17.50	130	0.535	2365	1265	304.3
		17.70	130	0.535	2340	1252	308.1
		18.00	130	0.540	2300	1242	316.1
		18.50	130	0.540	2235	1207	324.4
		19.00	130	0.545	2180	1188	336.8
		19.50	130	0.545	2120	1155	344.9
		20.00	130	0.545	2070	1128	354.4
	Steel 850 - 1100 N/mm ² 	16.90	110	0.385	2070	797	178.8
		17.20	110	0.390	2035	794	184.5
		17.50	110	0.395	2000	790	190.0
		17.70	110	0.400	1980	792	194.9
		18.00	110	0.405	1945	788	200.5
		18.50	110	0.415	1895	786	211.3
		19.00	110	0.420	1845	775	219.7
		19.50	110	0.430	1795	772	230.6
		20.00	110	0.440	1750	770	241.9
	Steel 1100 - 1300 N/mm ² 	16.90	70	0.320	1320	422	94.7
		17.20	70	0.330	1295	427	99.2
		17.50	70	0.335	1275	427	102.7
		17.70	70	0.340	1260	428	105.3
		18.00	70	0.345	1240	428	108.9
		18.50	70	0.355	1205	428	115.0
		19.00	70	0.360	1175	423	119.9
		19.50	70	0.375	1145	429	128.1
		20.00	70	0.385	1115	429	134.8
	Steel 1300 - 1500 N/mm ² 	16.90	40	0.250	755	189	42.4
		17.20	40	0.255	740	189	43.9
		17.50	40	0.260	730	190	45.7
		17.70	40	0.260	720	187	46.0
		18.00	40	0.265	705	187	47.6
		18.50	40	0.270	690	186	50.0
		19.00	40	0.280	670	188	53.3
		19.50	40	0.285	655	187	55.8
		20.00	40	0.290	635	184	57.8
	Stainless steel [Cr-Ni/1.4301] 	16.90	60	0.300	1130	339	76.0
		17.20	60	0.305	1110	339	78.8
		17.50	60	0.310	1090	338	81.3
		17.70	60	0.310	1080	335	82.4
		18.00	60	0.315	1060	334	85.0
		18.50	60	0.330	1030	340	91.4
		19.00	60	0.335	1005	337	95.5
		19.50	60	0.345	980	338	100.9
		20.00	60	0.355	955	339	106.5
	Cast iron (lamellar / spheroidal) 	16.90	180	0.535	3390	1814	406.9
		17.20	180	0.540	3330	1798	417.8
		17.50	180	0.545	3275	1785	429.3
		17.70	180	0.550	3235	1779	437.7
		18.00	180	0.560	3185	1784	454.0
		18.50	180	0.570	3095	1764	474.2
		19.00	180	0.580	3015	1749	495.9
		19.50	180	0.590	2940	1735	518.2
		20.00	180	0.605	2865	1733	544.4
	Wrought aluminium alloys Si < 6% hardened 	16.90	250	0.580	4710	2732	612.8
		17.20	250	0.585	4625	2706	628.7
		17.50	250	0.585	4545	2659	639.6
		17.70	250	0.590	4495	2652	652.5
		18.00	250	0.590	4420	2608	663.7
		18.50	250	0.595	4300	2559	687.9
		19.00	250	0.600	4190	2514	712.8
		19.50	250	0.605	4080	2468	737.1
		20.00	250	0.605	3980	2408	756.5

Spiral flute drills Supradrill®

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HM
MG10



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ReTool®

Rm
<850
HRC
<24

Rm
850-1100
HRC
24-34

Rm
1100-1300
HRC
34-42

Rm
1300-1500
HRC
42-48

Inox
Stainless

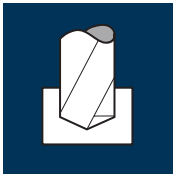
Ti
Titanium

GG(G)
Aluminium
Tool Steel

Example: Order-N°.							NANO-U²	
Article-N°.							B82005	
ø-Code							B83005	
Ø Code	d1 m7	d2 h5	l1	l2	l4	Lmax		
1690	16.90	18.0	143.0	91.1	48	65.7		●
1700	17.00	18.0	143.0	91.2	48	65.7		●
1710	17.10	18.0	143.0	91.3	48	65.6		●
1720	17.20	18.0	143.0	91.3	48	65.5		●
1730	17.30	18.0	143.0	91.4	48	65.5		●
1740	17.40	18.0	143.0	91.5	48	65.4		●
1750	17.50	18.0	143.0	91.6	48	65.4		●
1760	17.60	18.0	143.0	91.7	48	65.3		●
1770	17.70	18.0	143.0	91.8	48	65.3		●
1780	17.80	18.0	143.0	91.9	48	65.2		●
1790	17.90	18.0	143.0	92.1	48	65.2		●
1800	18.00	18.0	143.0	92.1	48	65.1		●
1850	18.50	20.0	153.0	98.7	50	71.0		●
1870	18.70	20.0	153.0	98.9	50	70.8		●
1900	19.00	20.0	153.0	99.2	50	70.7		●
1910	19.10	20.0	153.0	99.2	50	70.6		●
1920	19.20	20.0	153.0	99.3	50	70.5		●
1930	19.30	20.0	153.0	99.4	50	70.5		●
1950	19.50	20.0	153.0	99.6	50	70.3		●
1970	19.70	20.0	153.0	99.8	50	70.3		●
1980	19.80	20.0	153.0	99.9	50	70.2		●
2000	20.00	20.0	153.0	100.1	50	70.1		●

Application

Material



Steel
< 500 N/mm²



Steel
500 - 850 N/mm²



Steel
850 - 1100 N/mm²



Steel
1100 - 1300 N/mm²



Steel
1300 - 1500 N/mm²



Stainless steel
[Cr-Ni/1.4301]



Cast iron
(lamellar / spheroidal)



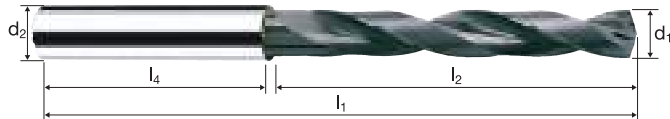
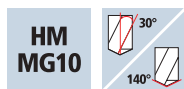
Wrought aluminium alloys
Si < 6%
hardened



d ₁ [mm]	v _c [m/min]	f [mm]	n [min ⁻¹]	v _f [mm/min]	Q [cm ³ /min]
2.50	140	0.0600	17825	1070	5.2
2.60	140	0.0600	17140	1028	5.5
2.80	140	0.0650	15915	1035	6.4
2.90	140	0.0700	15365	1076	7.1
3.00	170	0.0800	18040	1443	10.2
3.30	170	0.0850	16400	1394	11.9
3.50	170	0.0900	15460	1391	13.4
3.70	170	0.0950	14625	1389	14.9
3.80	170	0.1000	14240	1424	16.1
2.50	110	0.0600	14005	840	4.1
2.60	110	0.0600	13465	808	4.3
2.80	110	0.0650	12505	813	5.0
2.90	110	0.0700	12075	845	5.6
3.00	130	0.0800	13795	1104	7.8
3.30	130	0.0850	12540	1066	9.1
3.50	130	0.0900	11825	1064	10.2
3.70	130	0.0950	11185	1063	11.4
3.80	130	0.1000	10890	1089	12.4
2.50	80	0.0450	10185	458	2.2
2.60	80	0.0450	9795	441	2.3
2.80	80	0.0500	9095	455	2.8
2.90	80	0.0500	8780	439	2.9
3.00	110	0.0600	11670	700	4.9
3.30	110	0.0650	10610	690	5.9
3.50	110	0.0700	10005	700	6.7
3.70	110	0.0750	9465	710	7.6
3.80	110	0.0750	9215	691	7.8
2.50	55	0.0400	7005	280	1.4
2.60	55	0.0400	6735	269	1.4
2.80	55	0.0400	6255	250	1.5
2.90	55	0.0450	6035	272	1.8
3.00	70	0.0500	7425	371	2.6
3.30	70	0.0550	6750	371	3.2
3.50	70	0.0600	6365	382	3.7
3.70	70	0.0600	6020	361	3.9
3.80	70	0.0650	5865	381	4.3
2.50	25	0.0250	3185	80	0.4
2.60	25	0.0250	3060	77	0.4
2.80	25	0.0300	2840	85	0.5
2.90	25	0.0300	2745	82	0.5
3.00	40	0.0400	4245	170	1.2
3.30	40	0.0450	3860	174	1.5
3.50	40	0.0450	3640	164	1.6
3.70	40	0.0500	3440	172	1.8
3.80	40	0.0500	3350	168	1.9
3.00	60	0.0450	6365	286	2.0
3.30	60	0.0500	5785	289	2.5
3.50	60	0.0550	5455	300	2.9
3.70	60	0.0550	5160	284	3.1
3.80	60	0.0600	5025	302	3.4
2.50	160	0.0650	20370	1324	6.5
2.60	160	0.0650	19590	1273	6.8
2.80	160	0.0700	18190	1273	7.8
2.90	160	0.0750	17560	1317	8.7
3.00	220	0.0850	23345	1984	14.0
3.30	220	0.0950	21220	2016	17.2
3.50	220	0.1000	20010	2001	19.3
3.70	220	0.1050	18925	1987	21.4
3.80	220	0.1100	18430	2027	23.0
2.50	220	0.0500	28010	1401	6.9
2.60	220	0.0500	26935	1347	7.2
2.80	220	0.0550	25010	1376	8.5
2.90	220	0.0600	24150	1449	9.6
3.00	250	0.0650	26525	1724	12.2
3.30	250	0.0750	24115	1809	15.5
3.50	250	0.0800	22735	1819	17.5
3.70	250	0.0800	21505	1720	18.5
3.80	250	0.0850	20940	1780	20.2

Spiral flute drills Supradrill® U

5xd



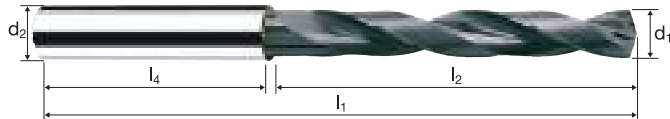
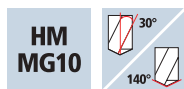
Rm <850 HRC <24	Rm 850-1100 HRC 24-34	Rm 1100-1300 HRC 34-42	Rm 1300-1500 HRC 42-48				Inox Stainless		GG(G) Aluminium
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Example: Order-N°. B62015 0250							NANO-U²	
							B62015	
							B63015	
Ø Code	d ₁ m7	d ₂ h5	l ₁	l ₂	l ₄	L _{max}		
0250*	2.50	6.0	66.0	24.5	36	20.7		●
0255*	2.55	6.0	66.0	24.5	36	20.7		●
0260*	2.60	6.0	66.0	24.5	36	20.6		●
0265*	2.65	6.0	66.0	24.6	36	20.6		●
0270*	2.70	6.0	66.0	24.6	36	20.5		●
0280*	2.80	6.0	66.0	24.6	36	20.4		●
0285*	2.85	6.0	66.0	24.7	36	20.4		●
0290*	2.90	6.0	66.0	24.7	36	20.3		●
0295*	2.95	6.0	66.0	24.7	36	20.3		●
0300	3.00	6.0	66.0	24.7	36	20.2		●
0305	3.05	6.0	66.0	24.8	36	20.2		●
0310	3.10	6.0	66.0	24.8	36	20.1		●
0315	3.15	6.0	66.0	24.8	36	20.1		●
0320	3.20	6.0	66.0	24.8	36	20.0		●
0330	3.30	6.0	66.0	24.9	36	19.9		●
0340	3.40	6.0	66.0	24.9	36	19.8		●
0350	3.50	6.0	66.0	25.0	36	19.7		●
0360	3.60	6.0	66.0	25.0	36	19.6		●
0370	3.70	6.0	66.0	25.1	36	19.5		●
0375	3.75	6.0	66.0	25.1	36	19.5		●
0380	3.80	6.0	74.0	33.1	36	27.4		●
0385	3.85	6.0	74.0	33.2	36	27.4		●
* without internal cooling								

Application	Material	d_1 [mm]	v_c [m/min]	f [mm]	n [min ⁻¹]	v_f [mm/min]	Q [cm ³ /min]
	Steel < 500 N/mm ² 	4.00	170	0.1050	13530	1421	17.9
		4.20	170	0.1100	12885	1417	19.6
		4.40	170	0.1150	12300	1415	21.5
		4.50	170	0.1200	12025	1443	22.9
		4.80	170	0.1250	11275	1409	25.5
		5.00	170	0.1300	10825	1407	27.6
		5.20	170	0.1350	10405	1405	29.8
		5.30	170	0.1400	10210	1429	31.5
		5.50	170	0.1450	9840	1427	33.9
	Steel 500 - 850 N/mm ² 	4.00	130	0.1050	10345	1086	13.6
		4.20	130	0.1100	9850	1084	15.0
		4.40	130	0.1150	9405	1082	16.4
		4.50	130	0.1200	9195	1103	17.5
		4.80	130	0.1250	8620	1078	19.5
		5.00	130	0.1300	8275	1076	21.1
		5.20	130	0.1350	7960	1075	22.8
		5.30	130	0.1400	7810	1093	24.1
		5.50	130	0.1450	7525	1091	25.9
	Steel 850 - 1100 N/mm ² 	4.00	110	0.0800	8755	700	8.8
		4.20	110	0.0850	8335	709	9.8
		4.40	110	0.0900	7960	716	10.9
		4.50	110	0.0900	7780	700	11.1
		4.80	110	0.0950	7295	693	12.5
		5.00	110	0.1000	7005	701	13.8
		5.20	110	0.1050	6735	707	15.0
		5.30	110	0.1050	6605	694	15.3
		5.50	110	0.1100	6365	700	16.6
	Steel 1100 - 1300 N/mm ² 	4.00	70	0.0650	5570	362	4.6
		4.20	70	0.0700	5305	371	5.1
		4.40	70	0.0750	5065	380	5.8
		4.50	70	0.0750	4950	371	5.9
		4.80	70	0.0800	4640	371	6.7
		5.00	70	0.0850	4455	379	7.4
		5.20	70	0.0850	4285	364	7.7
		5.30	70	0.0900	4205	379	8.4
		5.50	70	0.0900	4050	365	8.7
	Steel 1300 - 1500 N/mm ² 	4.00	40	0.0550	3185	175	2.2
		4.20	40	0.0550	3030	167	2.3
		4.40	40	0.0600	2895	174	2.6
		4.50	40	0.0600	2830	170	2.7
		4.80	40	0.0650	2655	173	3.1
		5.00	40	0.0650	2545	165	3.2
		5.20	40	0.0700	2450	172	3.6
		5.30	40	0.0700	2400	168	3.7
		5.50	40	0.0750	2315	174	4.1
	Stainless steel [Cr-Ni/1.4301] 	4.00	60	0.0600	4775	287	3.6
		4.20	60	0.0650	4545	295	4.1
		4.40	60	0.0700	4340	304	4.6
		4.50	60	0.0700	4245	297	4.7
		4.80	60	0.0750	3980	299	5.4
		5.00	60	0.0750	3820	287	5.6
		5.20	60	0.0800	3675	294	6.2
		5.30	60	0.0800	3605	288	6.4
		5.50	60	0.0850	3470	295	7.0
	Cast iron (lamellar / spheroidal) 	4.00	220	0.1150	17505	2013	25.3
		4.20	220	0.1200	16675	2001	27.7
		4.40	220	0.1250	15915	1989	30.2
		4.50	220	0.1300	15560	2023	32.2
		4.80	220	0.1350	14590	1970	35.6
		5.00	220	0.1450	14005	2031	39.9
		5.20	220	0.1500	13465	2020	42.9
		5.30	220	0.1500	13215	1982	43.7
		5.50	220	0.1550	12730	1973	46.9
	Wrought aluminium alloys Si < 6% hardened 	4.00	250	0.0900	19895	1791	22.5
		4.20	250	0.0950	18945	1800	24.9
		4.40	250	0.1000	18085	1809	27.5
		4.50	250	0.1000	17685	1769	28.1
		4.80	250	0.1050	16580	1741	31.5
		5.00	250	0.1100	15915	1751	34.4
		5.20	250	0.1150	15305	1760	37.4
		5.30	250	0.1200	15015	1802	39.8
		5.50	250	0.1200	14470	1736	41.3

Spiral flute drills Supradrill® U

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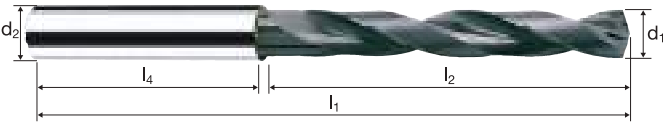
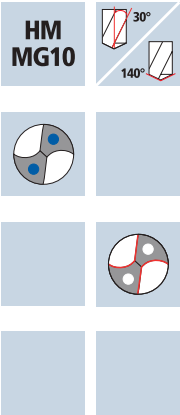
Rm <850 HRC <24	Rm 850-1100 HRC 24-34	Rm 1100-1300 HRC 34-42	Rm 1300-1500 HRC 42-48				Inox Stainless		GG(G) Aluminium
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Example: Order-N°. B62015 0390							NANO-U ²	
							B62015	
							B63015	
Ø Code	d ₁ m7	d ₂ h5	l ₁	l ₂	l ₄	L _{max}		
0390	3.90	6.0	74.0	33.2	36	27.3		●
0400	4.00	6.0	74.0	32.9	36	26.9		●
0410	4.10	6.0	74.0	33.0	36	26.8		●
0420	4.20	6.0	74.0	33.1	36	26.8		●
0430	4.30	6.0	74.0	33.2	36	26.7		●
0440	4.40	6.0	74.0	33.3	36	26.7		●
0445	4.45	6.0	74.0	33.3	36	26.6		●
0450	4.50	6.0	74.0	33.3	36	26.6		●
0460	4.60	6.0	74.0	33.4	36	26.5		●
0465	4.65	6.0	74.0	33.5	36	26.5		●
0470	4.70	6.0	74.0	33.5	36	26.5		●
0480	4.80	6.0	82.0	41.6	36	34.4		●
0490	4.90	6.0	82.0	41.7	36	34.3		●
0495	4.95	6.0	82.0	41.7	36	34.3		●
0500	5.00	6.0	82.0	41.8	36	34.3		●
0505	5.05	6.0	82.0	42.3	36	34.7		●
0510	5.10	6.0	82.0	42.3	36	34.7		●
0520	5.20	6.0	82.0	42.4	36	34.6		●
0525	5.25	6.0	82.0	42.5	36	34.6		●
0530	5.30	6.0	82.0	42.5	36	34.6		●
0540	5.40	6.0	82.0	42.6	36	34.5		●
0550	5.50	6.0	82.0	42.7	36	34.5		●
0555	5.55	6.0	82.0	42.8	36	34.4		●

Application	Material	d_1 [mm]	v_c [m/min]	f [mm]	n [min ⁻¹]	v_f [mm/min]	Q [cm ³ /min]
	Steel < 500 N/mm ² 	5.60	170	0.1450	9665	1401	34.5
		5.80	170	0.1550	9330	1446	38.2
		6.00	170	0.1600	9020	1443	40.8
		6.20	170	0.1650	8730	1441	43.5
		6.50	170	0.1700	8325	1415	47.0
		6.80	170	0.1800	7960	1433	52.0
		7.00	170	0.1850	7730	1430	55.0
		7.20	170	0.1900	7515	1428	58.1
		7.40	170	0.1950	7315	1426	61.3
		7.40	170	0.1950	7315	1426	61.3
	Steel 500 - 850 N/mm ² 	5.60	130	0.1450	7390	1072	26.4
		5.80	130	0.1550	7135	1106	29.2
		6.00	130	0.1600	6895	1103	31.2
		6.20	130	0.1650	6675	1101	33.3
		6.50	130	0.1700	6365	1082	35.9
		6.80	130	0.1800	6085	1095	39.8
		7.00	130	0.1850	5910	1093	42.1
		7.20	130	0.1900	5745	1092	44.4
		7.40	130	0.1950	5590	1090	46.9
		7.40	130	0.1950	5590	1090	46.9
	Steel 850 - 1100 N/mm ² 	5.60	110	0.1100	6255	688	16.9
		5.80	110	0.1150	6035	694	18.3
		6.00	110	0.1200	5835	700	19.8
		6.20	110	0.1250	5645	706	21.3
		6.50	110	0.1300	5385	700	23.2
		6.80	110	0.1350	5150	695	25.3
		7.00	110	0.1400	5000	700	26.9
		7.20	110	0.1450	4865	705	28.7
		7.40	110	0.1500	4730	710	30.5
		7.40	110	0.1500	4730	710	30.5
	Steel 1100 - 1300 N/mm ² 	5.60	70	0.0950	3980	378	9.3
		5.80	70	0.0950	3840	365	9.6
		6.00	70	0.1000	3715	372	10.5
		6.20	70	0.1050	3595	378	11.4
		6.50	70	0.1100	3430	377	12.5
		6.80	70	0.1150	3275	377	13.7
		7.00	70	0.1150	3185	366	14.1
		7.20	70	0.1200	3095	371	15.1
		7.40	70	0.1250	3010	376	16.2
		7.40	70	0.1250	3010	376	16.2
	Steel 1300 - 1500 N/mm ² 	5.60	40	0.0750	2275	171	4.2
		5.80	40	0.0750	2195	165	4.3
		6.00	40	0.0800	2120	170	4.8
		6.20	40	0.0850	2055	175	5.3
		6.50	40	0.0850	1960	167	5.5
		6.80	40	0.0900	1870	168	6.1
		7.00	40	0.0950	1820	173	6.7
		7.20	40	0.0950	1770	168	6.8
		7.40	40	0.1000	1720	172	7.4
		7.40	40	0.1000	1720	172	7.4
	Stainless steel [Cr-Ni/1.4301] 	5.60	60	0.0850	3410	290	7.1
		5.80	60	0.0900	3295	297	7.8
		6.00	60	0.0900	3185	287	8.1
		6.20	60	0.0950	3080	293	8.8
		6.50	60	0.1000	2940	294	9.8
		6.80	60	0.1050	2810	295	10.7
		7.00	60	0.1100	2730	300	11.6
		7.20	60	0.1100	2655	292	11.9
		7.40	60	0.1150	2580	297	12.8
		7.40	60	0.1150	2580	297	12.8
	Cast iron (lamellar / spheroidal) 	5.60	220	0.1600	12505	2001	49.3
		5.80	220	0.1650	12075	1992	52.6
		6.00	220	0.1700	11670	1984	56.1
		6.20	220	0.1750	11295	1977	59.7
		6.50	220	0.1850	10775	1993	66.1
		6.80	220	0.1950	10300	2009	72.9
		7.00	220	0.2000	10005	2001	77.0
		7.20	220	0.2050	9725	1994	81.2
		7.40	220	0.2100	9465	1988	85.5
		7.40	220	0.2100	9465	1988	85.5
	Wrought aluminium alloys Si < 6% hardened 	5.60	250	0.1250	14210	1776	43.8
		5.80	250	0.1300	13720	1784	47.1
		6.00	250	0.1350	13265	1791	50.6
		6.20	250	0.1400	12835	1797	54.2
		6.50	250	0.1450	12245	1776	58.9
		6.80	250	0.1500	11705	1756	63.8
		7.00	250	0.1550	11370	1762	67.8
		7.20	250	0.1600	11050	1768	72.0
		7.40	250	0.1650	10755	1775	76.3
		7.40	250	0.1650	10755	1775	76.3

Spiral flute drills Supradrill® U

5xd



ToolSchool

B82005 / B83005

Rm <850
HRC <24

Rm 850-1100
HRC 24-34

Rm 1100-1300
HRC 34-42

Rm 1300-1500
HRC 42-48

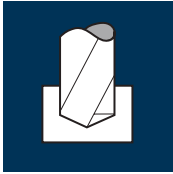
Inox
Stainless

GG(G)
Aluminium

Example: Order-Nº.							NANO-U²	
Article-Nº. B62015 ø-Code 0560								
								
Ø Code	d ₁ m7	d ₂ h5	l ₁	l ₂	l ₄	L _{max}		
0560	5.60	6.0	82.0	42.8	36	34.4		●
0565	5.65	6.0	82.0	42.9	36	34.4		●
0570	5.70	6.0	82.0	42.9	36	34.4		●
0575	5.75	6.0	82.0	43.0	36	34.4		●
0580	5.80	6.0	82.0	43.1	36	34.4		●
0590	5.90	6.0	82.0	43.3	36	34.4		●
0600	6.00	6.0	82.0	43.2	36	34.2		●
0610	6.10	8.0	91.0	50.5	36	41.3		●
0620	6.20	8.0	91.0	50.6	36	41.3		●
0630	6.30	8.0	91.0	50.6	36	41.2		●
0640	6.40	8.0	91.0	50.7	36	41.1		●
0650	6.50	8.0	91.0	50.8	36	41.1		●
0660	6.60	8.0	91.0	50.9	36	41.0		●
0670	6.70	8.0	91.0	51.0	36	40.9		●
0680	6.80	8.0	91.0	51.1	36	40.9		●
0690	6.90	8.0	91.0	51.2	36	40.8		●
0700	7.00	8.0	91.0	51.2	36	40.7		●
0710	7.10	8.0	91.0	51.3	36	40.7		●
0720	7.20	8.0	91.0	51.4	36	40.6		●
0725	7.25	8.0	91.0	51.5	36	40.6		●
0730	7.30	8.0	91.0	51.5	36	40.6		●
0740	7.40	8.0	91.0	51.6	36	40.5		●
0745	7.45	8.0	91.0	51.6	36	40.5		●

Application

Material



Steel
< 500 N/mm²



Steel
500 - 850 N/mm²



Steel
850 - 1100 N/mm²



Steel
1100 - 1300 N/mm²



Steel
1300 - 1500 N/mm²



Stainless steel
[Cr-Ni/1.4301]



Cast iron
(lamellar / spheroidal)



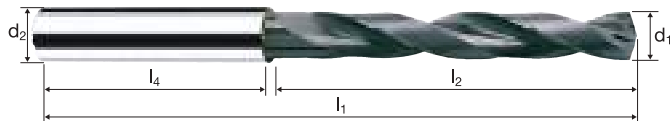
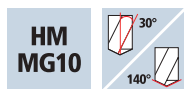
Wrought aluminium alloys
Si < 6%
hardened



d ₁ [mm]	v _c [m/min]	f [mm]	n [min ⁻¹]	v _f [mm/min]	Q [cm ³ /min]
7.50	170	0.1950	7215	1407	62.2
7.60	170	0.2000	7120	1424	64.6
7.80	170	0.2050	6940	1423	68.0
8.00	170	0.2100	6765	1421	71.4
8.20	170	0.2150	6600	1419	74.9
8.50	170	0.2250	6365	1432	81.3
8.80	170	0.2300	6150	1415	86.0
9.00	170	0.2350	6015	1414	89.9
9.20	170	0.2400	5880	1411	93.8
7.50	130	0.1950	5515	1075	47.5
7.60	130	0.2000	5445	1089	49.4
7.80	130	0.2050	5305	1088	52.0
8.00	130	0.2100	5175	1087	54.6
8.20	130	0.2150	5045	1085	57.3
8.50	130	0.2250	4870	1096	62.2
8.80	130	0.2300	4700	1081	65.7
9.00	130	0.2350	4600	1081	68.8
9.20	130	0.2400	4500	1080	71.8
7.50	110	0.1500	4670	701	30.9
7.60	110	0.1500	4605	691	31.3
7.80	110	0.1550	4490	696	33.3
8.00	110	0.1600	4375	700	35.2
8.20	110	0.1650	4270	705	37.2
8.50	110	0.1700	4120	700	39.7
8.80	110	0.1750	3980	697	42.4
9.00	110	0.1800	3890	700	44.5
9.20	110	0.1850	3805	704	46.8
7.50	70	0.1250	2970	371	16.4
7.60	70	0.1250	2930	366	16.6
7.80	70	0.1300	2855	371	17.7
8.00	70	0.1350	2785	376	18.9
8.20	70	0.1350	2715	367	19.4
8.50	70	0.1400	2620	367	20.8
8.80	70	0.1450	2530	367	22.3
9.00	70	0.1500	2475	371	23.6
9.20	70	0.1550	2420	375	24.9
7.50	40	0.1000	1700	170	7.5
7.60	40	0.1000	1675	168	7.6
7.80	40	0.1050	1630	171	8.2
8.00	40	0.1050	1590	167	8.4
8.20	40	0.1100	1555	171	9.0
8.50	40	0.1150	1500	173	9.8
8.80	40	0.1150	1445	166	10.1
9.00	40	0.1200	1415	170	10.8
9.20	40	0.1250	1385	173	11.5
7.50	60	0.1150	2545	293	12.9
7.60	60	0.1150	2515	289	13.1
7.80	60	0.1200	2450	294	14.0
8.00	60	0.1250	2385	298	15.0
8.20	60	0.1250	2330	291	15.4
8.50	60	0.1300	2245	292	16.6
8.80	60	0.1350	2170	293	17.8
9.00	60	0.1400	2120	297	18.9
9.20	60	0.1400	2075	291	19.3
7.50	220	0.2150	9335	2007	88.7
7.60	220	0.2150	9215	1981	89.9
7.80	220	0.2250	8980	2021	96.5
8.00	220	0.2300	8755	2014	101.2
8.20	220	0.2350	8540	2007	106.0
8.50	220	0.2450	8240	2019	114.6
8.80	220	0.2500	7960	1990	121.0
9.00	220	0.2550	7780	1984	126.2
9.20	220	0.2650	7610	2017	134.1
7.50	250	0.1650	10610	1751	77.3
7.60	250	0.1700	10470	1780	80.7
7.80	250	0.1750	10200	1785	85.3
8.00	250	0.1800	9945	1790	90.0
8.20	250	0.1800	9705	1747	92.3
8.50	250	0.1900	9360	1778	100.9
8.80	250	0.1950	9045	1764	107.3
9.00	250	0.2000	8840	1768	112.5
9.20	250	0.2050	8650	1773	117.9

Spiral flute drills Supradrill® U

5xd



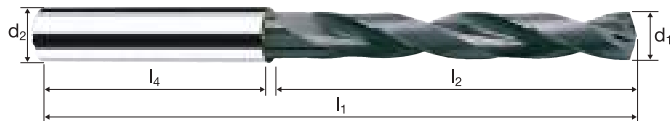
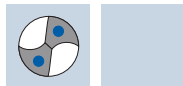
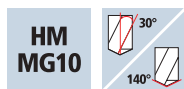
Rm <850 HRC <24	Rm 850-1100 HRC 24-34	Rm 1100-1300 HRC 34-42	Rm 1300-1500 HRC 42-48				Inox Stainless		GG(G) Aluminium
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Example: Order-N°. B62015 0750							NANO-U ²	
							B62015	
							B63015	
Ø Code	d ₁ m7	d ₂ h5	l ₁	l ₂	l ₄	L _{max}		
0750	7.50	8.0	91.0	51.7	36	40.4		●
0755	7.55	8.0	91.0	51.7	36	40.4		●
0760	7.60	8.0	91.0	51.8	36	40.4		●
0765	7.65	8.0	91.0	51.9	36	40.4		●
0770	7.70	8.0	91.0	51.9	36	40.4		●
0780	7.80	8.0	91.0	52.1	36	40.4		●
0790	7.90	8.0	91.0	52.2	36	40.4		●
0800	8.00	8.0	91.0	52.3	36	40.3		●
0810	8.10	10.0	103.0	58.5	40	46.3		●
0820	8.20	10.0	103.0	58.5	40	46.2		●
0830	8.30	10.0	103.0	58.6	40	46.2		●
0840	8.40	10.0	103.0	58.7	40	46.1		●
0850	8.50	10.0	103.0	58.8	40	46.0		●
0860	8.60	10.0	103.0	58.9	40	46.0		●
0870	8.70	10.0	103.0	59.0	40	45.9		●
0875	8.75	10.0	103.0	59.0	40	45.9		●
0880	8.80	10.0	103.0	59.1	40	45.9		●
0885	8.85	10.0	103.0	59.1	40	45.8		●
0890	8.90	10.0	103.0	59.1	40	45.8		●
0900	9.00	10.0	103.0	59.2	40	45.7		●
0910	9.10	10.0	103.0	59.3	40	45.7		●
0920	9.20	10.0	103.0	59.4	40	45.6		●
0925	9.25	10.0	103.0	59.4	40	45.6		●

Application	Material	d ₁ [mm]	v _c [m/min]	f [mm]	n [min ⁻¹]	v _f [mm/min]	Q [cm ³ /min]
	Steel < 500 N/mm ² 	9.40	170	0.2450	5755	1410	97.9
		9.50	170	0.2500	5695	1424	100.9
		9.60	170	0.2550	5635	1437	104.0
		9.80	170	0.2600	5520	1435	108.3
		10.00	170	0.2650	5410	1434	112.6
		10.20	170	0.2700	5305	1432	117.0
		10.50	170	0.2750	5155	1418	122.8
		10.80	170	0.2850	5010	1428	130.8
		11.00	170	0.2900	4920	1427	135.6
			Steel 500 - 850 N/mm ²	9.40	130	0.2450	4400
9.50	130			0.2500	4355	1089	77.2
9.60	130			0.2550	4310	1099	79.6
9.80	130			0.2600	4220	1097	82.8
10.00	130			0.2650	4140	1097	86.2
10.20	130			0.2700	4055	1095	89.5
10.50	130			0.2750	3940	1084	93.8
10.80	130			0.2850	3830	1092	100.0
11.00	130			0.2900	3760	1090	103.6
	Steel 850 - 1100 N/mm ²			9.40	110	0.1900	3725
		9.50	110	0.1900	3685	700	49.6
		9.60	110	0.1900	3645	693	50.1
		9.80	110	0.1950	3575	697	52.6
		10.00	110	0.2000	3500	700	55.0
		10.20	110	0.2050	3435	704	57.5
		10.50	110	0.2100	3335	700	60.6
		10.80	110	0.2150	3240	697	63.8
		11.00	110	0.2200	3185	701	66.6
			Steel 1100 - 1300 N/mm ²	9.40	70	0.1550	2370
9.50	70			0.1600	2345	375	26.6
9.60	70			0.1600	2320	371	26.9
9.80	70			0.1650	2275	375	28.3
10.00	70			0.1650	2230	368	28.9
10.20	70			0.1700	2185	372	30.4
10.50	70			0.1750	2120	371	32.1
10.80	70			0.1800	2065	372	34.1
11.00	70			0.1850	2025	375	35.6
	Steel 1300 - 1500 N/mm ²			9.40	40	0.1250	1355
		9.50	40	0.1250	1340	168	11.9
		9.60	40	0.1300	1325	172	12.5
		9.80	40	0.1300	1300	169	12.7
		10.00	40	0.1350	1275	172	13.5
		10.20	40	0.1350	1250	169	13.8
		10.50	40	0.1400	1215	170	14.7
		10.80	40	0.1450	1180	171	15.7
		11.00	40	0.1450	1155	168	15.9
			Stainless steel [Cr-Ni/1.4301]	9.40	60	0.1450	2030
9.50	60			0.1450	2010	292	20.7
9.60	60			0.1500	1990	299	21.6
9.80	60			0.1500	1950	293	22.1
10.00	60			0.1550	1910	296	23.3
10.20	60			0.1550	1870	290	23.7
10.50	60			0.1600	1820	291	25.2
10.80	60			0.1650	1770	292	26.8
11.00	60			0.1700	1735	295	28.0
	Cast iron (lamellar / spheroidal)			9.40	220	0.2700	7450
		9.50	220	0.2700	7370	1990	141.0
		9.60	220	0.2750	7295	2006	145.2
		9.80	220	0.2800	7145	2001	150.9
		10.00	220	0.2850	7005	1996	156.8
		10.20	220	0.2900	6865	1991	162.7
		10.50	220	0.3000	6670	2001	173.3
		10.80	220	0.3100	6485	2010	184.2
		11.00	220	0.3150	6365	2005	190.5
			Wrought aluminium alloys Si < 6% hardened	9.40	250	0.2100	8465
9.50	250			0.2100	8375	1759	124.7
9.60	250			0.2150	8290	1782	129.0
9.80	250			0.2200	8120	1786	134.7
10.00	250			0.2200	7960	1751	137.5
10.20	250			0.2250	7800	1755	143.4
10.50	250			0.2350	7580	1781	154.2
10.80	250			0.2400	7370	1769	162.0
11.00	250			0.2450	7235	1773	168.5

Spiral flute drills Supradrill® U

5xd



ToolSchool

B82005 / B83005

Rm
<850
HRC
<24

Rm
850-1100
HRC
24-34

Rm
1100-1300
HRC
34-42

Rm
1300-1500
HRC
42-48

Inox
Stainless

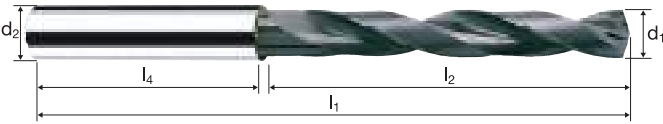
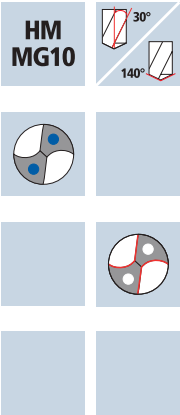
GG(G)
Aluminium

Example: Order-Nº.							NANO-U ²	
Article-Nº. B62015 ø-Code 0930							B62015	
							B63015	
Ø Code	d ₁ m7	d ₂ h5	l ₁	l ₂	l ₄	L _{max}		
0930	9.30	10.0	103.0	59.5	40	45.5		●
0940	9.40	10.0	103.0	59.6	40	45.5		●
0950	9.50	10.0	103.0	59.7	40	45.4		●
0955	9.55	10.0	103.0	59.7	40	45.4		●
0960	9.60	10.0	103.0	59.8	40	45.4		●
0965	9.65	10.0	103.0	59.8	40	45.4		●
0970	9.70	10.0	103.0	59.9	40	45.3		●
0980	9.80	10.0	103.0	60.0	40	45.3		●
0990	9.90	10.0	103.0	60.2	40	45.3		●
1000	10.00	10.0	103.0	60.2	40	45.2		●
1010	10.10	12.0	118.0	68.4	45	53.3		●
1020	10.20	12.0	118.0	68.5	45	53.2		●
1030	10.30	12.0	118.0	68.6	45	53.2		●
1040	10.40	12.0	118.0	68.7	45	53.1		●
1050	10.50	12.0	118.0	68.8	45	53.0		●
1060	10.60	12.0	118.0	68.9	45	53.0		●
1070	10.70	12.0	118.0	69.0	45	52.9		●
1080	10.80	12.0	118.0	69.0	45	52.8		●
1090	10.90	12.0	118.0	69.1	45	52.8		●
1100	11.00	12.0	118.0	69.2	45	52.7		●
1110	11.10	12.0	118.0	69.3	45	52.6		●
1120	11.20	12.0	118.0	69.4	45	52.6		●
1130	11.30	12.0	118.0	69.5	45	52.5		●

Application	Material	d_1 [mm]	v_c [m/min]	f [mm]	n [min ⁻¹]	v_f [mm/min]	Q [cm ³ /min]
	Steel < 500 N/mm ² 	11.50	170	0.3050	4705	1435	149.1
		11.80	170	0.3100	4585	1421	155.4
		12.00	170	0.3150	4510	1421	160.7
		12.20	170	0.3200	4435	1419	165.9
		12.50	170	0.3300	4330	1429	175.4
		12.80	170	0.3350	4230	1417	182.4
		13.00	170	0.3400	4165	1416	188.0
		13.20	170	0.3450	4100	1415	193.6
		13.50	170	0.3550	4010	1424	203.8
		13.50	170	0.3550	4010	1424	203.8
	Steel 500 - 850 N/mm ² 	11.50	130	0.3050	3600	1098	114.0
		11.80	130	0.3100	3505	1087	118.8
		12.00	130	0.3150	3450	1087	122.9
		12.20	130	0.3200	3390	1085	126.8
		12.50	130	0.3300	3310	1092	134.0
		12.80	130	0.3350	3235	1084	139.5
		13.00	130	0.3400	3185	1083	143.7
		13.20	130	0.3450	3135	1082	148.0
		13.50	130	0.3550	3065	1088	155.7
		13.50	130	0.3550	3065	1088	155.7
	Steel 850 - 1100 N/mm ² 	11.50	110	0.2300	3045	700	72.7
		11.80	110	0.2350	2965	697	76.2
		12.00	110	0.2400	2920	701	79.3
		12.20	110	0.2450	2870	703	82.2
		12.50	110	0.2500	2800	700	85.9
		12.80	110	0.2550	2735	697	89.7
		13.00	110	0.2600	2695	701	93.0
		13.20	110	0.2650	2655	704	96.3
		13.50	110	0.2700	2595	701	100.3
		13.50	110	0.2700	2595	701	100.3
	Steel 1100 - 1300 N/mm ² 	11.50	70	0.1900	1940	369	38.3
		11.80	70	0.1950	1890	369	40.3
		12.00	70	0.2000	1855	371	42.0
		12.20	70	0.2050	1825	374	43.7
		12.50	70	0.2100	1785	375	46.0
		12.80	70	0.2150	1740	374	48.1
		13.00	70	0.2150	1715	369	48.9
		13.20	70	0.2200	1690	372	50.9
		13.50	70	0.2250	1650	371	53.1
		13.50	70	0.2250	1650	371	53.1
	Steel 1300 - 1500 N/mm ² 	11.50	40	0.1550	1105	171	17.8
		11.80	40	0.1550	1080	167	18.3
		12.00	40	0.1600	1060	170	19.2
		12.20	40	0.1650	1045	172	20.2
		12.50	40	0.1650	1020	168	20.7
		12.80	40	0.1700	995	169	21.8
		13.00	40	0.1750	980	172	22.8
		13.20	40	0.1750	965	169	23.1
		13.50	40	0.1800	945	170	24.3
		13.50	40	0.1800	945	170	24.3
	Stainless steel [Cr-Ni/1.4301] 	11.50	60	0.1750	1660	291	30.2
		11.80	60	0.1800	1620	292	31.9
		12.00	60	0.1850	1590	294	33.3
		12.20	60	0.1900	1565	297	34.8
		12.50	60	0.1900	1530	291	35.7
		12.80	60	0.1950	1490	291	37.4
		13.00	60	0.2000	1470	294	39.0
		13.20	60	0.2050	1445	296	40.5
		13.50	60	0.2100	1415	297	42.5
		13.50	60	0.2100	1415	297	42.5
	Cast iron (lamellar / spheroidal) 	11.50	220	0.3300	6090	2010	208.7
		11.80	220	0.3350	5935	1988	217.4
		12.00	220	0.3450	5835	2013	227.7
		12.20	220	0.3500	5740	2009	234.8
		12.50	220	0.3550	5600	1988	244.0
		12.80	220	0.3650	5470	1997	256.9
		13.00	220	0.3700	5385	1993	264.5
		13.20	220	0.3750	5305	1989	272.2
		13.50	220	0.3850	5185	1996	285.7
		13.50	220	0.3850	5185	1996	285.7
	Wrought aluminium alloys Si < 6% hardened 	11.50	250	0.2550	6920	1765	183.3
		11.80	250	0.2600	6745	1754	191.8
		12.00	250	0.2650	6630	1757	198.7
		12.20	250	0.2700	6525	1762	206.0
		12.50	250	0.2800	6365	1782	218.7
		12.80	250	0.2850	6215	1771	227.9
		13.00	250	0.2900	6120	1775	235.6
		13.20	250	0.2950	6030	1779	243.4
		13.50	250	0.3000	5895	1769	253.1
		13.50	250	0.3000	5895	1769	253.1

Spiral flute drills Supradrill® U

5xd



ToolSchool

B82005 / B83005

Rm
<850
HRC
<24

Rm
850-1100
HRC
24-34

Rm
1100-1300
HRC
34-42

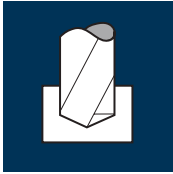
Rm
1300-1500
HRC
42-48

Inox
Stainless

GG(G)
Aluminium

Example: Order-Nº.							NANO-U²	
Article-Nº. ø-Code							B62015	
B62015 1140							B63015	
Ø Code	d1 m7	d2 h5	l1	l2	l4	Lmax		
1140	11.40	12.0	118.0	69.6	45	52.5		●
1150	11.50	12.0	118.0	69.7	45	52.4		●
1160	11.60	12.0	118.0	69.8	45	52.4		●
1170	11.70	12.0	118.0	69.9	45	52.3		●
1180	11.80	12.0	118.0	70.0	45	52.3		●
1190	11.90	12.0	118.0	70.2	45	52.3		●
1200	12.00	12.0	118.0	70.2	45	52.2		●
1210	12.10	14.0	124.0	74.4	45	56.3		●
1220	12.20	14.0	124.0	74.5	45	56.2		●
1230	12.30	14.0	124.0	74.6	45	56.1		●
1240	12.40	14.0	124.0	74.7	45	56.1		●
1250	12.50	14.0	124.0	74.8	45	56.0		●
1260	12.60	14.0	124.0	74.9	45	56.0		●
1270	12.70	14.0	124.0	74.9	45	55.9		●
1280	12.80	14.0	124.0	75.0	45	55.8		●
1290	12.90	14.0	124.0	75.1	45	55.8		●
1300	13.00	14.0	124.0	75.2	45	55.7		●
1310	13.10	14.0	124.0	75.3	45	55.6		●
1320	13.20	14.0	124.0	75.4	45	55.6		●
1330	13.30	14.0	124.0	75.5	45	55.5		●
1340	13.40	14.0	124.0	75.5	45	55.4		●
1350	13.50	14.0	124.0	75.6	45	55.4		●
1360	13.60	14.0	124.0	75.7	45	55.3		●

Application



Material

Steel
< 500 N/mm²



Steel
500 - 850 N/mm²



Steel
850 - 1100 N/mm²



Steel
1100 - 1300 N/mm²



Steel
1300 - 1500 N/mm²



Stainless steel
[Cr-Ni/1.4301]



Cast iron
(lamellar / spheroidal)



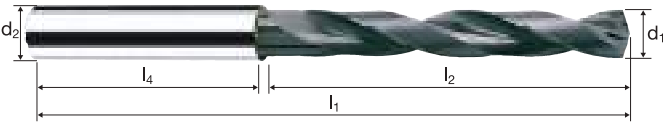
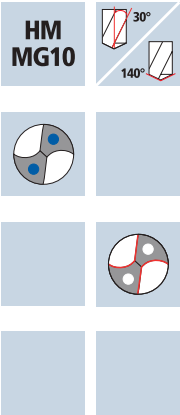
Wrought aluminium alloys
Si < 6%
hardened



d ₁ [mm]	v _c [m/min]	f [mm]	n [min ⁻¹]	v _f [mm/min]	Q [cm ³ /min]
13.80	170	0.3650	3920	1431	214.0
14.00	170	0.3700	3865	1430	220.1
14.20	170	0.3750	3810	1429	226.3
14.50	170	0.3800	3730	1417	234.1
14.80	170	0.3900	3655	1426	245.2
15.00	170	0.3950	3610	1426	252.0
15.20	170	0.4000	3560	1424	258.4
15.50	170	0.4100	3490	1431	270.0
15.80	170	0.4150	3425	1421	278.7
13.80	130	0.3650	3000	1095	163.8
14.00	130	0.3700	2955	1093	168.3
14.20	130	0.3750	2915	1093	173.1
14.50	130	0.3800	2855	1085	179.1
14.80	130	0.3900	2795	1090	187.5
15.00	130	0.3950	2760	1090	192.7
15.20	130	0.4000	2720	1088	197.4
15.50	130	0.4100	2670	1095	206.6
15.80	130	0.4150	2620	1087	213.2
13.80	110	0.2750	2535	697	104.3
14.00	110	0.2800	2500	700	107.8
14.20	110	0.2850	2465	703	111.3
14.50	110	0.2900	2415	700	115.7
14.80	110	0.2950	2365	698	120.0
15.00	110	0.3000	2335	701	123.8
15.20	110	0.3050	2305	703	127.6
15.50	110	0.3100	2260	701	132.2
15.80	110	0.3150	2215	698	136.8
13.80	70	0.2300	1615	372	55.6
14.00	70	0.2350	1590	374	57.5
14.20	70	0.2350	1570	369	58.4
14.50	70	0.2400	1535	368	60.8
14.80	70	0.2450	1505	369	63.4
15.00	70	0.2500	1485	371	65.6
15.20	70	0.2550	1465	374	67.8
15.50	70	0.2600	1440	374	70.6
15.80	70	0.2650	1410	374	73.3
13.80	40	0.1850	925	171	25.6
14.00	40	0.1850	910	168	25.9
14.20	40	0.1900	895	170	26.9
14.50	40	0.1950	880	172	28.3
14.80	40	0.1950	860	168	28.9
15.00	40	0.2000	850	170	30.0
15.20	40	0.2050	840	172	31.2
15.50	40	0.2050	820	168	31.7
15.80	40	0.2100	805	169	33.2
13.80	60	0.2100	1385	291	43.5
14.00	60	0.2150	1365	294	45.2
14.20	60	0.2200	1345	296	46.9
14.50	60	0.2250	1315	296	48.9
14.80	60	0.2300	1290	297	51.0
15.00	60	0.2300	1275	293	51.8
15.20	60	0.2350	1255	295	53.5
15.50	60	0.2400	1230	295	55.7
15.80	60	0.2450	1210	297	58.1
13.80	220	0.3950	5075	2005	299.8
14.00	220	0.4000	5000	2000	307.9
14.20	220	0.4050	4930	1997	316.2
14.50	220	0.4150	4830	2005	331.0
14.80	220	0.4250	4730	2010	345.8
15.00	220	0.4300	4670	2008	354.9
15.20	220	0.4350	4605	2003	363.5
15.50	220	0.4450	4520	2011	379.5
15.80	220	0.4500	4430	1994	390.9
13.80	250	0.3050	5765	1758	263.0
14.00	250	0.3100	5685	1762	271.3
14.20	250	0.3150	5605	1766	279.6
14.50	250	0.3200	5490	1757	290.1
14.80	250	0.3300	5375	1774	305.2
15.00	250	0.3350	5305	1777	314.1
15.20	250	0.3400	5235	1780	323.0
15.50	250	0.3450	5135	1772	334.3
15.80	250	0.3500	5035	1762	345.5

Spiral flute drills Supradrill® U

5xd



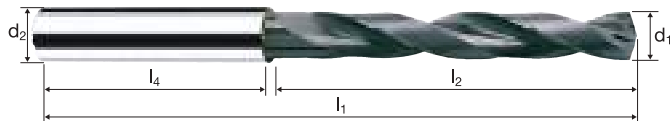
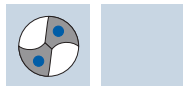
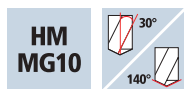
Rm <850 HRC <24	Rm 850-1100 HRC 24-34	Rm 1100-1300 HRC 34-42	Rm 1300-1500 HRC 42-48				Inox Stainless		GG(G) Aluminium
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Example: Order-Nº.							Article-Nº. ø-Code		NANO-U²
							B62015 1370		
Ø Code	d ₁ m7	d ₂ h5	l ₁	l ₂	l ₄	L _{max}		B63015	
1370	13.70	14.0	124.0	75.9	45	55.3		●	
1380	13.80	14.0	124.0	76.0	45	55.3		●	
1390	13.90	14.0	124.0	76.1	45	55.3		●	
1400	14.00	14.0	124.0	76.2	45	55.2		●	
1410	14.10	16.0	133.0	80.4	48	59.3		●	
1420	14.20	16.0	133.0	80.5	48	59.2		●	
1430	14.30	16.0	133.0	80.6	48	59.1		●	
1440	14.40	16.0	133.0	80.7	48	59.1		●	
1450	14.50	16.0	133.0	80.8	48	59.0		●	
1460	14.60	16.0	133.0	80.8	48	58.9		●	
1470	14.70	16.0	133.0	80.9	48	58.9		●	
1480	14.80	16.0	133.0	81.0	48	58.8		●	
1490	14.90	16.0	133.0	81.1	48	58.8		●	
1500	15.00	16.0	133.0	81.2	48	58.7		●	
1510	15.10	16.0	133.0	81.3	48	58.6		●	
1520	15.20	16.0	133.0	81.4	48	58.6		●	
1530	15.30	16.0	133.0	81.4	48	58.5		●	
1540	15.40	16.0	133.0	81.5	48	58.4		●	
1550	15.50	16.0	133.0	81.6	48	58.4		●	
1560	15.60	16.0	133.0	81.7	48	58.3		●	
1570	15.70	16.0	133.0	81.8	48	58.3		●	
1580	15.80	16.0	133.0	82.0	48	58.3		●	
1590	15.90	16.0	133.0	82.1	48	58.3		●	

Application	Material	d_1 [mm]	v_c [m/min]	f [mm]	n [min ⁻¹]	v_f [mm/min]	Q [cm ³ /min]
	Steel < 500 N/mm ² 	16.00	170	0.4200	3380	1420	285.4
		16.20	170	0.4250	3340	1420	292.6
		16.50	170	0.4350	3280	1427	305.1
		16.80	170	0.4400	3220	1417	314.1
		17.00	170	0.4450	3185	1417	321.7
		17.20	170	0.4550	3145	1431	332.5
		17.50	170	0.4600	3090	1421	341.9
		17.80	170	0.4700	3040	1429	355.6
		18.00	170	0.4750	3005	1427	363.2
		18.00	170	0.4750	3005	1427	363.2
	Steel 500 - 850 N/mm ² 	16.00	130	0.4200	2585	1086	218.3
		16.20	130	0.4250	2555	1086	223.8
		16.50	130	0.4350	2510	1092	233.5
		16.80	130	0.4400	2465	1085	240.4
		17.00	130	0.4450	2435	1084	246.0
		17.20	130	0.4550	2405	1094	254.3
		17.50	130	0.4600	2365	1088	261.7
		17.80	130	0.4700	2325	1093	271.9
		18.00	130	0.4750	2300	1093	278.0
		18.00	130	0.4750	2300	1093	278.0
	Steel 850 - 1100 N/mm ² 	16.00	110	0.3200	2190	701	140.9
		16.20	110	0.3250	2160	702	144.7
		16.50	110	0.3300	2120	700	149.6
		16.80	110	0.3350	2085	699	154.8
		17.00	110	0.3400	2060	700	159.0
		17.20	110	0.3450	2035	702	163.1
		17.50	110	0.3500	2000	700	168.4
		17.80	110	0.3550	1965	698	173.6
		18.00	110	0.3600	1945	700	178.2
		18.00	110	0.3600	1945	700	178.2
	Steel 1100 - 1300 N/mm ² 	16.00	70	0.2650	1395	370	74.3
		16.20	70	0.2700	1375	371	76.5
		16.50	70	0.2750	1350	371	79.4
		16.80	70	0.2800	1325	371	82.2
		17.00	70	0.2850	1310	373	84.8
		17.20	70	0.2850	1295	369	85.8
		17.50	70	0.2900	1275	370	88.9
		17.80	70	0.2950	1250	369	91.8
		18.00	70	0.3000	1240	372	94.7
		18.00	70	0.3000	1240	372	94.7
	Steel 1300 - 1500 N/mm ² 	16.00	40	0.2150	795	171	34.4
		16.20	40	0.2150	785	169	34.8
		16.50	40	0.2200	770	169	36.2
		16.80	40	0.2250	760	171	37.9
		17.00	40	0.2250	750	169	38.3
		17.20	40	0.2300	740	170	39.5
		17.50	40	0.2350	730	172	41.3
		17.80	40	0.2350	715	168	41.8
		18.00	40	0.2400	705	169	43.1
		18.00	40	0.2400	705	169	43.1
	Stainless steel [Cr-Ni/1.4301] 	16.00	60	0.2450	1195	293	58.9
		16.20	60	0.2500	1180	295	60.8
		16.50	60	0.2550	1155	295	63.0
		16.80	60	0.2600	1135	295	65.4
		17.00	60	0.2600	1125	293	66.4
		17.20	60	0.2650	1110	294	68.4
		17.50	60	0.2700	1090	294	70.8
		17.80	60	0.2750	1075	296	73.6
		18.00	60	0.2750	1060	292	74.2
		18.00	60	0.2750	1060	292	74.2
	Cast iron (lamellar / spheroidal) 	16.00	220	0.4550	4375	1991	400.2
		16.20	220	0.4650	4325	2011	414.5
		16.50	220	0.4700	4245	1995	426.6
		16.80	220	0.4800	4170	2002	443.7
		17.00	220	0.4850	4120	1998	453.6
		17.20	220	0.4900	4070	1994	463.4
		17.50	220	0.5000	4000	2000	481.1
		17.80	220	0.5100	3935	2007	499.4
		18.00	220	0.5150	3890	2003	509.8
		18.00	220	0.5150	3890	2003	509.8
	Wrought aluminium alloys Si < 6% hardened 	16.00	250	0.3550	4975	1766	355.1
		16.20	250	0.3600	4910	1768	364.3
		16.50	250	0.3650	4825	1761	376.6
		16.80	250	0.3750	4735	1776	393.6
		17.00	250	0.3800	4680	1778	403.7
		17.20	250	0.3800	4625	1758	408.4
		17.50	250	0.3900	4545	1773	426.4
		17.80	250	0.3950	4470	1766	439.4
		18.00	250	0.4000	4420	1768	449.9
		18.00	250	0.4000	4420	1768	449.9

Spiral flute drills Supradrill® U

5xd



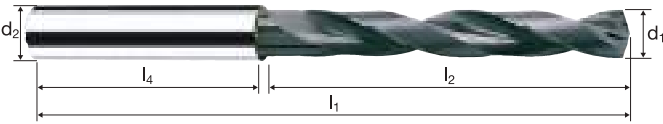
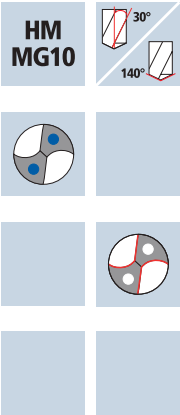
Rm <850 HRC <24	Rm 850-1100 HRC 24-34	Rm 1100-1300 HRC 34-42	Rm 1300-1500 HRC 42-48				Inox Stainless		GG(G) Aluminium
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Example: Order-N°. B62015 1600							NANO-U ²	
							B62015	
							B63015	
Ø Code	d ₁ m7	d ₂ h5	l ₁	l ₂	l ₄	L _{max}		
1600	16.00	18.0	133.0	82.2	48	58.2		●
1610	16.10	18.0	143.0	90.4	48	66.2		●
1620	16.20	18.0	143.0	90.5	48	66.2		●
1630	16.30	18.0	143.0	90.6	48	66.1		●
1640	16.40	18.0	143.0	90.7	48	66.1		●
1650	16.50	18.0	143.0	90.7	48	66.0		●
1660	16.60	18.0	143.0	90.8	48	65.9		●
1670	16.70	18.0	143.0	90.9	48	65.9		●
1680	16.80	18.0	143.0	91.0	48	65.8		●
1690	16.90	18.0	143.0	91.1	48	65.7		●
1700	17.00	18.0	143.0	91.2	48	65.7		●
1710	17.10	18.0	143.0	91.3	48	65.6		●
1720	17.20	18.0	143.0	91.3	48	65.5		●
1730	17.30	18.0	143.0	91.4	48	65.5		●
1740	17.40	18.0	143.0	91.5	48	65.4		●
1750	17.50	18.0	143.0	91.6	48	65.4		●
1760	17.60	18.0	143.0	91.7	48	65.3		●
1770	17.70	18.0	143.0	91.8	48	65.3		●
1780	17.80	18.0	143.0	91.9	48	65.2		●
1790	17.90	18.0	143.0	92.1	48	65.2		●
1800	18.00	18.0	143.0	92.1	48	65.1		●

Application	Material	d_1 [mm]	v_c [m/min]	f [mm]	n [min ⁻¹]	v_f [mm/min]	Q [cm ³ /min]
	Steel < 500 N/mm ² 	18.50	170	0.4850	2925	1419	381.3
		18.70	170	0.4900	2895	1419	389.6
		19.00	170	0.5000	2850	1425	404.0
		19.20	170	0.5050	2820	1424	412.3
		19.30	170	0.5100	2805	1431	418.5
		19.50	170	0.5150	2775	1429	426.8
		19.70	170	0.5200	2745	1427	435.1
		19.80	170	0.5200	2735	1422	437.9
		20.00	170	0.5250	2705	1420	446.1
		20.00	170	0.5250	2705	1420	446.1
	Steel 500 - 850 N/mm ²	18.50	130	0.4850	2235	1084	291.4
		18.70	130	0.4900	2215	1085	298.1
		19.00	130	0.5000	2180	1090	309.0
		19.20	130	0.5050	2155	1088	315.1
		19.30	130	0.5100	2145	1094	320.1
		19.50	130	0.5150	2120	1092	326.1
		19.70	130	0.5200	2100	1092	332.8
		19.80	130	0.5200	2090	1087	334.6
		20.00	130	0.5250	2070	1087	341.4
		20.00	130	0.5250	2070	1087	341.4
	Steel 850 - 1100 N/mm ²	18.50	110	0.3700	1895	701	188.5
		18.70	110	0.3750	1870	701	192.6
		19.00	110	0.3800	1845	701	198.8
		19.20	110	0.3850	1825	703	203.4
		19.30	110	0.3850	1815	699	204.4
		19.50	110	0.3900	1795	700	209.1
		19.70	110	0.3950	1775	701	213.7
		19.80	110	0.3950	1770	699	215.3
		20.00	110	0.4000	1750	700	219.9
		20.00	110	0.4000	1750	700	219.9
	Steel 1100 - 1300 N/mm ²	18.50	70	0.3100	1205	374	100.4
		18.70	70	0.3100	1190	369	101.3
		19.00	70	0.3150	1175	370	104.9
		19.20	70	0.3200	1160	371	107.5
		19.30	70	0.3200	1155	370	108.1
		19.50	70	0.3250	1145	372	111.1
		19.70	70	0.3300	1130	373	113.7
		19.80	70	0.3300	1125	371	114.3
		20.00	70	0.3350	1115	374	117.3
		20.00	70	0.3350	1115	374	117.3
	Steel 1300 - 1500 N/mm ²	18.50	40	0.2450	690	169	45.5
		18.70	40	0.2500	680	170	46.7
		19.00	40	0.2550	670	171	48.5
		19.20	40	0.2550	665	170	49.1
		19.30	40	0.2550	660	168	49.2
		19.50	40	0.2600	655	170	50.9
		19.70	40	0.2650	645	171	52.1
		19.80	40	0.2650	645	171	52.6
		20.00	40	0.2650	635	168	52.9
		20.00	40	0.2650	635	168	52.9
	Stainless steel [Cr-Ni/1.4301]	18.50	60	0.2850	1030	294	78.9
		18.70	60	0.2900	1020	296	81.2
		19.00	60	0.2900	1005	292	82.6
		19.20	60	0.2950	995	294	85.0
		19.30	60	0.2950	990	292	85.5
		19.50	60	0.3000	980	294	87.8
		19.70	60	0.3050	970	296	90.2
		19.80	60	0.3050	965	294	90.6
		20.00	60	0.3100	955	296	93.0
		20.00	60	0.3100	955	296	93.0
	Cast iron (lamellar / spheroidal)	18.50	220	0.5300	3785	2006	539.2
		18.70	220	0.5350	3745	2004	550.3
		19.00	220	0.5450	3685	2008	569.4
		19.20	220	0.5500	3645	2005	580.4
		19.30	220	0.5500	3630	1997	584.1
		19.50	220	0.5550	3590	1993	595.1
		19.70	220	0.5650	3555	2009	612.2
		19.80	220	0.5650	3535	1997	615.0
		20.00	220	0.5700	3500	1995	626.7
		20.00	220	0.5700	3500	1995	626.7
	Wrought aluminium alloys Si < 6% hardened	18.50	250	0.4100	4300	1763	473.9
		18.70	250	0.4150	4255	1766	485.0
		19.00	250	0.4200	4190	1760	499.0
		19.20	250	0.4250	4145	1762	510.0
		19.30	250	0.4300	4125	1774	518.9
		19.50	250	0.4350	4080	1775	530.0
		19.70	250	0.4400	4040	1778	541.8
		19.80	250	0.4400	4020	1769	544.6
		20.00	250	0.4450	3980	1771	556.4
		20.00	250	0.4450	3980	1771	556.4

Spiral flute drills Supradrill® U

5xd

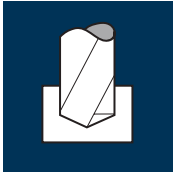


Rm <850 HRC <24	Rm 850-1100 HRC 24-34	Rm 1100-1300 HRC 34-42	Rm 1300-1500 HRC 42-48				Inox Stainless		GG(G) Aluminium
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Example: Order-N°.							Article-N°.		ø-Code		NANO-U²	
							B62015		1850		B62015	
											B63015	
Ø Code	d ₁ m7	d ₂ h5	l ₁ l ₂		l ₄	L _{max}						
1850	18.50	20.0	153.0 98.7		50	71.0					●	
1870	18.70	20.0	153.0 98.9		50	70.8					●	
1900	19.00	20.0	153.0 99.2		50	70.7					●	
1910	19.10	20.0	153.0 99.2		50	70.6					●	
1920	19.20	20.0	153.0 99.3		50	70.5					●	
1930	19.30	20.0	153.0 99.4		50	70.5					●	
1950	19.50	20.0	153.0 99.6		50	70.3					●	
1970	19.70	20.0	153.0 99.8		50	70.3					●	
1980	19.80	20.0	153.0 99.9		50	70.2					●	
2000	20.00	20.0	153.0 100.1		50	70.1					●	

Application

Material



Steel
< 500 N/mm²



Steel
500 - 850 N/mm²



Steel
850 - 1100 N/mm²



Steel
1100 - 1300 N/mm²



Steel
1300 - 1500 N/mm²



Cold work tool steel
(12% Cr),
high alloyed
[1.2379]



Cast iron
(lamellar / spheroidal)



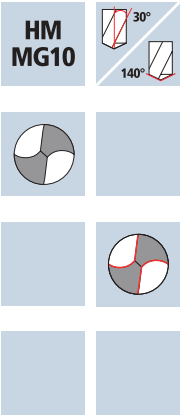
Wrought aluminium alloys
Si < 6%
hardened



d ₁ [mm]	v _c [m/min]	f [mm]	n [min ⁻¹]	v _f [mm/min]	Q [cm ³ /min]
2.50	140	0.0600	17825	1070	5.2
2.70	140	0.0650	16505	1073	6.1
2.90	140	0.0700	15365	1076	7.1
3.00	140	0.0700	14855	1040	7.4
3.30	140	0.0800	13505	1080	9.2
3.50	140	0.0850	12730	1082	10.4
3.80	140	0.0900	11725	1055	12.0
4.00	140	0.0950	11140	1058	13.3
4.20	140	0.1000	10610	1061	14.7
2.50	110	0.0600	14005	840	4.1
2.70	110	0.0650	12970	843	4.8
2.90	110	0.0700	12075	845	5.6
3.00	110	0.0700	11670	817	5.8
3.30	110	0.0800	10610	849	7.3
3.50	110	0.0850	10005	850	8.2
3.80	110	0.0900	9215	829	9.4
4.00	110	0.0950	8755	832	10.5
4.20	110	0.1000	8335	834	11.5
2.50	80	0.0450	10185	458	2.2
2.70	80	0.0500	9430	472	2.7
2.90	80	0.0500	8780	439	2.9
3.00	80	0.0550	8490	467	3.3
3.30	80	0.0600	7715	463	4.0
3.50	80	0.0650	7275	473	4.5
3.80	80	0.0700	6700	469	5.3
4.00	80	0.0700	6365	446	5.6
4.20	80	0.0750	6065	455	6.3
2.50	55	0.0400	7005	280	1.4
2.70	55	0.0400	6485	259	1.5
2.90	55	0.0450	6035	272	1.8
3.00	55	0.0450	5835	263	1.9
3.30	55	0.0500	5305	265	2.3
3.50	55	0.0550	5000	275	2.6
3.80	55	0.0550	4605	253	2.9
4.00	55	0.0600	4375	263	3.3
4.20	55	0.0650	4170	271	3.8
2.50	25	0.0250	3185	80	0.4
2.70	25	0.0250	2945	74	0.4
2.90	25	0.0300	2745	82	0.5
3.00	25	0.0300	2655	80	0.6
3.30	25	0.0350	2410	84	0.7
3.50	25	0.0350	2275	80	0.8
3.80	25	0.0400	2095	84	1.0
4.00	25	0.0400	1990	80	1.0
4.20	25	0.0400	1895	76	1.1
2.50	50	0.0300	6365	191	0.9
2.70	50	0.0350	5895	206	1.2
2.90	50	0.0350	5490	192	1.3
3.00	50	0.0400	5305	212	1.5
3.30	50	0.0400	4825	193	1.7
3.50	50	0.0450	4545	205	2.0
3.80	50	0.0500	4190	210	2.4
4.00	50	0.0500	3980	199	2.5
4.20	50	0.0550	3790	209	2.9
2.50	160	0.0650	20370	1324	6.5
2.70	160	0.0700	18865	1321	7.6
2.90	160	0.0750	17560	1317	8.7
3.00	160	0.0750	16975	1273	9.0
3.30	160	0.0850	15435	1312	11.2
3.50	160	0.0900	14550	1310	12.6
3.80	160	0.1000	13405	1341	15.2
4.00	160	0.1050	12730	1337	16.8
4.20	160	0.1100	12125	1334	18.5
2.50	220	0.0500	28010	1401	6.9
2.70	220	0.0550	25935	1426	8.2
2.90	220	0.0600	24150	1449	9.6
3.00	220	0.0600	23345	1401	9.9
3.30	220	0.0650	21220	1379	11.8
3.50	220	0.0700	20010	1401	13.5
3.80	220	0.0750	18430	1382	15.7
4.00	220	0.0800	17505	1400	17.6
4.20	220	0.0850	16675	1417	19.6

Spiral flute drills Supradrill® U

5xd

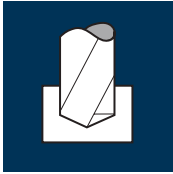


ReTool®

Rm <850 HRC <24	Rm 850-1100 HRC 24-34	Rm 1100-1300 HRC 34-42	Rm 1300-1500 HRC 42-48						GG(G) Aluminium
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Example: Order-Nº.							Article-Nº.		ø-Code		NANO-U²	
							B62014		0250		B62014	
											B63014	
Ø Code	d1 m7	d2 h5	L1	L2	L4	Lmax						
0250	2.50	6.0	66.0	24.5	36	20.7					●	
0255	2.55	6.0	66.0	24.5	36	20.7					●	
0260	2.60	6.0	66.0	24.5	36	20.6					●	
0265	2.65	6.0	66.0	24.6	36	20.6					●	
0270	2.70	6.0	66.0	24.6	36	20.5					●	
0280	2.80	6.0	66.0	24.6	36	20.4					●	
0285	2.85	6.0	66.0	24.7	36	20.4					●	
0290	2.90	6.0	66.0	24.7	36	20.3					●	
0295	2.95	6.0	66.0	24.7	36	20.3					●	
0300	3.00	6.0	66.0	24.7	36	20.2					●	
0310	3.10	6.0	66.0	24.8	36	20.1					●	
0320	3.20	6.0	66.0	24.8	36	20.0					●	
0330	3.30	6.0	66.0	24.9	36	19.9					●	
0340	3.40	6.0	66.0	24.9	36	19.8					●	
0350	3.50	6.0	66.0	25.0	36	19.7					●	
0360	3.60	6.0	66.0	25.0	36	19.6					●	
0370	3.70	6.0	66.0	25.1	36	19.5					●	
0380	3.80	6.0	74.0	33.1	36	27.4					●	
0390	3.90	6.0	74.0	33.2	36	27.3					●	
0400	4.00	6.0	74.0	32.9	36	26.9					●	
0410	4.10	6.0	74.0	33.0	36	26.8					●	
0420	4.20	6.0	74.0	33.1	36	26.8					●	
0430	4.30	6.0	74.0	33.2	36	26.7					●	

Application



Material

Steel
< 500 N/mm²



Steel
500 - 850 N/mm²



Steel
850 - 1100 N/mm²



Steel
1100 - 1300 N/mm²



Steel
1300 - 1500 N/mm²



Cold work tool steel
(12% Cr),
high alloyed
[1.2379]



Cast iron
(lamellar / spheroidal)



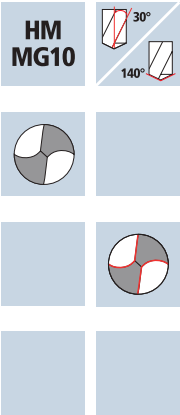
Wrought aluminium alloys
Si < 6%
hardened



d ₁ [mm]	v _c [m/min]	f [mm]	n [min ⁻¹]	v _f [mm/min]	Q [cm ² /min]
4.50	140	0.1050	9905	1040	16.5
4.80	140	0.1150	9285	1068	19.3
5.00	140	0.1200	8915	1070	21.0
5.10	140	0.1200	8740	1049	21.4
5.50	140	0.1300	8100	1053	25.0
5.80	140	0.1350	7685	1038	27.4
6.00	140	0.1400	7425	1040	29.4
6.10	140	0.1450	7305	1059	31.0
6.50	140	0.1550	6855	1063	35.3
4.50	110	0.1050	7780	817	13.0
4.80	110	0.1150	7295	839	15.2
5.00	110	0.1200	7005	841	16.5
5.10	110	0.1200	6865	824	16.8
5.50	110	0.1300	6365	828	19.7
5.80	110	0.1350	6035	815	21.5
6.00	110	0.1400	5835	817	23.1
6.10	110	0.1450	5740	832	24.3
6.50	110	0.1550	5385	835	27.7
4.50	80	0.0800	5660	453	7.2
4.80	80	0.0850	5305	451	8.2
5.00	80	0.0900	5095	459	9.0
5.10	80	0.0900	4995	450	9.2
5.50	80	0.1000	4630	463	11.0
5.80	80	0.1050	4390	461	12.2
6.00	80	0.1100	4245	467	13.2
6.10	80	0.1100	4175	459	13.4
6.50	80	0.1150	3920	451	15.0
4.50	55	0.0700	3890	272	4.3
4.80	55	0.0700	3645	255	4.6
5.00	55	0.0750	3500	263	5.2
5.10	55	0.0750	3435	258	5.3
5.50	55	0.0850	3185	271	6.4
5.80	55	0.0850	3020	257	6.8
6.00	55	0.0900	2920	263	7.4
6.10	55	0.0900	2870	258	7.5
6.50	55	0.1000	2695	270	8.9
4.50	25	0.0450	1770	80	1.3
4.80	25	0.0500	1660	83	1.5
5.00	25	0.0500	1590	80	1.6
5.10	25	0.0500	1560	78	1.6
5.50	25	0.0550	1445	80	1.9
5.80	25	0.0600	1370	82	2.2
6.00	25	0.0600	1325	80	2.2
6.10	25	0.0600	1305	78	2.3
6.50	25	0.0650	1225	80	2.6
4.50	50	0.0600	3535	212	3.4
4.80	50	0.0600	3315	199	3.6
5.00	50	0.0650	3185	207	4.1
5.10	50	0.0650	3120	203	4.1
5.50	50	0.0700	2895	203	4.8
5.80	50	0.0750	2745	206	5.4
6.00	50	0.0750	2655	199	5.6
6.10	50	0.0800	2610	209	6.1
6.50	50	0.0850	2450	208	6.9
4.50	160	0.1150	11320	1302	20.7
4.80	160	0.1250	10610	1326	24.0
5.00	160	0.1300	10185	1324	26.0
5.10	160	0.1300	9985	1298	26.5
5.50	160	0.1400	9260	1296	30.8
5.80	160	0.1500	8780	1317	34.8
6.00	160	0.1550	8490	1316	37.2
6.10	160	0.1550	8350	1294	37.8
6.50	160	0.1650	7835	1293	42.9
4.50	220	0.0900	15560	1400	22.3
4.80	220	0.0950	14590	1386	25.1
5.00	220	0.1000	14005	1401	27.5
5.10	220	0.1000	13730	1373	28.0
5.50	220	0.1100	12730	1400	33.3
5.80	220	0.1150	12075	1389	36.7
6.00	220	0.1200	11670	1400	39.6
6.10	220	0.1200	11480	1378	40.3
6.50	220	0.1300	10775	1401	46.5

Spiral flute drills Supradrill® U

5xd



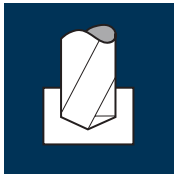
ReTool®

Rm <850 HRC <24	Rm 850-1100 HRC 24-34	Rm 1100-1300 HRC 34-42	Rm 1300-1500 HRC 42-48						GG(G) Aluminium
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Example: Order-N°.							Article-N°.		ø-Code				NANO-U²
							B62014		0440				B62014
													B63014
Ø Code	d ₁ m7	d ₂ h5	l ₁		l ₂	l ₄		L _{max}					
0440	4.40	6.0	74.0		33.3	36		26.7				●	
0450	4.50	6.0	74.0		33.3	36		26.6				●	
0460	4.60	6.0	74.0		33.4	36		26.5				●	
0470	4.70	6.0	74.0		33.5	36		26.5				●	
0480	4.80	6.0	82.0		41.6	36		34.4				●	
0490	4.90	6.0	82.0		41.7	36		34.3				●	
0500	5.00	6.0	82.0		41.8	36		34.3				●	
0510	5.10	6.0	82.0		42.3	36		34.7				●	
0520	5.20	6.0	82.0		42.4	36		34.6				●	
0530	5.30	6.0	82.0		42.5	36		34.6				●	
0540	5.40	6.0	82.0		42.6	36		34.5				●	
0550	5.50	6.0	82.0		42.7	36		34.5				●	
0560	5.60	6.0	82.0		42.8	36		34.4				●	
0570	5.70	6.0	82.0		42.9	36		34.4				●	
0580	5.80	6.0	82.0		43.1	36		34.4				●	
0590	5.90	6.0	82.0		43.3	36		34.4				●	
0600	6.00	6.0	82.0		43.2	36		34.2				●	
0610	6.10	8.0	91.0		50.5	36		41.3				●	
0620	6.20	8.0	91.0		50.6	36		41.3				●	
0630	6.30	8.0	91.0		50.6	36		41.2				●	
0640	6.40	8.0	91.0		50.7	36		41.1				●	
0650	6.50	8.0	91.0		50.8	36		41.1				●	
0660	6.60	8.0	91.0		50.9	36		41.0				●	

Application

Material



Steel
< 500 N/mm²



Steel
500 - 850 N/mm²



Steel
850 - 1100 N/mm²



Steel
1100 - 1300 N/mm²



Steel
1300 - 1500 N/mm²



Cold work tool steel
(12% Cr),
high alloyed
[1.2379]



Cast iron
(lamellar / spheroidal)



Wrought aluminium alloys
Si < 6%
hardened



d ₁ [mm]	v _c [m/min]	f [mm]	n [min ⁻¹]	v _f [mm/min]	Q [cm ³ /min]
6.80	140	0.1600	6555	1049	38.1
6.90	140	0.1650	6460	1066	39.9
7.00	140	0.1650	6365	1050	40.4
7.50	140	0.1800	5940	1069	47.2
7.80	140	0.1850	5715	1057	50.5
8.00	140	0.1900	5570	1058	53.2
8.20	140	0.1950	5435	1060	56.0
8.50	140	0.2000	5245	1049	59.5
8.60	140	0.2050	5180	1062	61.7
6.80	110	0.1600	5150	824	29.9
6.90	110	0.1650	5075	837	31.3
7.00	110	0.1650	5000	825	31.7
7.50	110	0.1800	4670	841	37.1
7.80	110	0.1850	4490	831	39.7
8.00	110	0.1900	4375	831	41.8
8.20	110	0.1950	4270	833	44.0
8.50	110	0.2000	4120	824	46.8
8.60	110	0.2050	4070	834	48.5
6.80	80	0.1200	3745	449	16.3
6.90	80	0.1250	3690	461	17.2
7.00	80	0.1250	3640	455	17.5
7.50	80	0.1350	3395	458	20.2
7.80	80	0.1400	3265	457	21.8
8.00	80	0.1450	3185	462	23.2
8.20	80	0.1500	3105	466	24.6
8.50	80	0.1550	2995	464	26.3
8.60	80	0.1550	2960	459	26.7
6.80	55	0.1000	2575	258	9.4
6.90	55	0.1050	2535	266	10.0
7.00	55	0.1050	2500	263	10.1
7.50	55	0.1150	2335	269	11.9
7.80	55	0.1150	2245	258	12.3
8.00	55	0.1200	2190	263	13.2
8.20	55	0.1250	2135	267	14.1
8.50	55	0.1300	2060	268	15.2
8.60	55	0.1300	2035	265	15.4
6.80	25	0.0700	1170	82	3.0
6.90	25	0.0700	1155	81	3.0
7.00	25	0.0700	1135	80	3.1
7.50	25	0.0750	1060	80	3.5
7.80	25	0.0800	1020	82	3.9
8.00	25	0.0800	995	80	4.0
8.20	25	0.0800	970	78	4.1
8.50	25	0.0850	935	80	4.5
8.60	25	0.0850	925	79	4.6
6.80	50	0.0850	2340	199	7.2
6.90	50	0.0900	2305	208	7.8
7.00	50	0.0900	2275	205	7.9
7.50	50	0.0950	2120	201	8.9
7.80	50	0.1000	2040	204	9.7
8.00	50	0.1050	1990	209	10.5
8.20	50	0.1050	1940	204	10.8
8.50	50	0.1100	1870	206	11.7
8.60	50	0.1100	1850	204	11.8
6.80	160	0.1750	7490	1311	47.6
6.90	160	0.1750	7380	1292	48.3
7.00	160	0.1800	7275	1310	50.4
7.50	160	0.1950	6790	1324	58.5
7.80	160	0.2000	6530	1306	62.4
8.00	160	0.2050	6365	1305	65.6
8.20	160	0.2100	6210	1304	68.9
8.50	160	0.2200	5990	1318	74.8
8.60	160	0.2200	5920	1302	75.7
6.80	220	0.1350	10300	1391	50.5
6.90	220	0.1400	10150	1421	53.1
7.00	220	0.1400	10005	1401	53.9
7.50	220	0.1500	9335	1400	61.9
7.80	220	0.1550	8980	1392	66.5
8.00	220	0.1600	8755	1401	70.4
8.20	220	0.1650	8540	1409	74.4
8.50	220	0.1700	8240	1401	79.5
8.60	220	0.1700	8145	1385	80.4

Spiral flute drills Supradrill® U

5xd

HM
MG10



ReTool®

Rm
<850
HRC
<24

Rm
850-1100
HRC
24-34

Rm
1100-1300
HRC
34-42

Rm
1300-1500
HRC
42-48

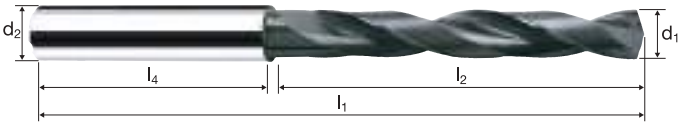
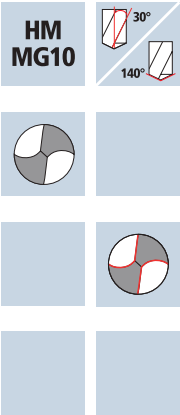
GG(G)
Aluminium

							NANO-U ²	
Example: Order-Nº.							B62014	
Article-Nº. ø-Code							B63014	
Ø Code	d ₁ m7	d ₂ h5	l ₁	l ₂	l ₄	L _{max}		
0670	6.70	8.0	91.0	51.0	36	40.9		●
0680	6.80	8.0	91.0	51.1	36	40.9		●
0690	6.90	8.0	91.0	51.2	36	40.8		●
0700	7.00	8.0	91.0	51.2	36	40.7		●
0710	7.10	8.0	91.0	51.3	36	40.7		●
0720	7.20	8.0	91.0	51.4	36	40.6		●
0730	7.30	8.0	91.0	51.5	36	40.6		●
0740	7.40	8.0	91.0	51.6	36	40.5		●
0750	7.50	8.0	91.0	51.7	36	40.4		●
0760	7.60	8.0	91.0	51.8	36	40.4		●
0770	7.70	8.0	91.0	51.9	36	40.4		●
0780	7.80	8.0	91.0	52.1	36	40.4		●
0790	7.90	8.0	91.0	52.2	36	40.4		●
0800	8.00	8.0	91.0	52.3	36	40.3		●
0810	8.10	10.0	103.0	58.5	40	46.3		●
0820	8.20	10.0	103.0	58.5	40	46.2		●
0830	8.30	10.0	103.0	58.6	40	46.2		●
0840	8.40	10.0	103.0	58.7	40	46.1		●
0850	8.50	10.0	103.0	58.8	40	46.0		●
0860	8.60	10.0	103.0	58.9	40	46.0		●
0870	8.70	10.0	103.0	59.0	40	45.9		●
0880	8.80	10.0	103.0	59.1	40	45.9		●
0890	8.90	10.0	103.0	59.1	40	45.8		●

Application	Material	d_1 [mm]	v_c [m/min]	f [mm]	n [min ⁻¹]	v_f [mm/min]	Q [cm ³ /min]
	Steel < 500 N/mm ² 	9.00	140	0.2150	4950	1064	67.7
		9.50	140	0.2250	4690	1055	74.8
		9.80	140	0.2300	4545	1045	78.9
		10.00	140	0.2350	4455	1047	82.2
		10.20	140	0.2400	4370	1049	85.7
		10.40	140	0.2450	4285	1050	89.2
		10.50	140	0.2500	4245	1061	91.9
		10.80	140	0.2550	4125	1052	96.4
		11.00	140	0.2600	4050	1053	100.1
	Steel 500 - 850 N/mm ² 	9.00	110	0.2150	3890	836	53.2
		9.50	110	0.2250	3685	829	58.8
		9.80	110	0.2300	3575	822	62.0
		10.00	110	0.2350	3500	823	64.6
		10.20	110	0.2400	3435	824	67.4
		10.40	110	0.2450	3365	824	70.0
		10.50	110	0.2500	3335	834	72.2
		10.80	110	0.2550	3240	826	75.7
		11.00	110	0.2600	3185	828	78.7
	Steel 850 - 1100 N/mm ² 	9.00	80	0.1600	2830	453	28.8
		9.50	80	0.1700	2680	456	32.3
		9.80	80	0.1750	2600	455	34.3
		10.00	80	0.1800	2545	458	36.0
		10.20	80	0.1850	2495	462	37.7
		10.40	80	0.1850	2450	453	38.5
		10.50	80	0.1900	2425	461	39.9
		10.80	80	0.1950	2360	460	42.2
		11.00	80	0.2000	2315	463	44.0
	Steel 1100 - 1300 N/mm ² 	9.00	55	0.1350	1945	263	16.7
		9.50	55	0.1450	1845	268	19.0
		9.80	55	0.1450	1785	259	19.5
		10.00	55	0.1500	1750	263	20.6
		10.20	55	0.1550	1715	266	21.7
		10.40	55	0.1550	1685	261	22.2
		10.50	55	0.1600	1665	266	23.1
		10.80	55	0.1600	1620	259	23.7
		11.00	55	0.1650	1590	262	24.9
	Steel 1300 - 1500 N/mm ² 	9.00	25	0.0900	885	80	5.1
		9.50	25	0.0950	840	80	5.7
		9.80	25	0.1000	810	81	6.1
		10.00	25	0.1000	795	80	6.2
		10.20	25	0.1000	780	78	6.4
		10.40	25	0.1050	765	80	6.8
		10.50	25	0.1050	760	80	6.9
		10.80	25	0.1100	735	81	7.4
		11.00	25	0.1100	725	80	7.6
	Cold work tool steel (12% Cr), high alloyed [1.2379] 	9.00	50	0.1150	1770	204	13.0
		9.50	50	0.1200	1675	201	14.2
		9.80	50	0.1250	1625	203	15.3
		10.00	50	0.1300	1590	207	16.2
		10.20	50	0.1300	1560	203	16.6
		10.40	50	0.1350	1530	207	17.6
		10.50	50	0.1350	1515	205	17.7
		10.80	50	0.1400	1475	207	18.9
		11.00	50	0.1400	1445	202	19.2
	Cast iron (lamellar / spheroidal)  	9.00	160	0.2300	5660	1302	82.8
		9.50	160	0.2450	5360	1313	93.1
		9.80	160	0.2500	5195	1299	98.0
		10.00	160	0.2550	5095	1299	102.0
		10.20	160	0.2600	4995	1299	106.1
		10.40	160	0.2650	4895	1297	110.2
		10.50	160	0.2700	4850	1310	113.4
		10.80	160	0.2800	4715	1320	120.9
		11.00	160	0.2850	4630	1320	125.4
	Wrought aluminium alloys Si < 6% hardened 	9.00	220	0.1800	7780	1400	89.1
		9.50	220	0.1900	7370	1400	99.3
		9.80	220	0.1950	7145	1393	105.1
		10.00	220	0.2000	7005	1401	110.0
		10.20	220	0.2050	6865	1407	115.0
		10.40	220	0.2100	6735	1414	120.2
		10.50	220	0.2100	6670	1401	121.3
		10.80	220	0.2150	6485	1394	127.7
		11.00	220	0.2200	6365	1400	133.1

Spiral flute drills Supradrill® U

5xd



ReTool®

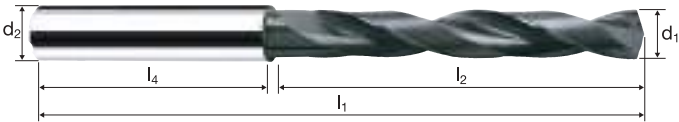
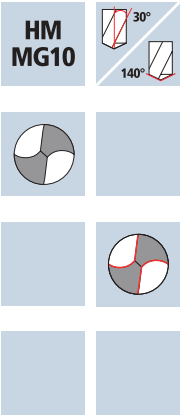
Rm <850 HRC <24	Rm 850-1100 HRC 24-34	Rm 1100-1300 HRC 34-42	Rm 1300-1500 HRC 42-48						GG(G) Aluminium
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Example: Order-Nº.							NANO-U²	
Article-Nº. ø-Code							B62014	
B62014 0900							B63014	
Ø Code	d1 m7	d2 h5	l1	l2	l4	Lmax		
0900	9.00	10.0	103.0	59.2	40	45.7		●
0910	9.10	10.0	103.0	59.3	40	45.7		●
0920	9.20	10.0	103.0	59.4	40	45.6		●
0930	9.30	10.0	103.0	59.5	40	45.5		●
0940	9.40	10.0	103.0	59.6	40	45.5		●
0950	9.50	10.0	103.0	59.7	40	45.4		●
0960	9.60	10.0	103.0	59.8	40	45.4		●
0970	9.70	10.0	103.0	59.9	40	45.3		●
0980	9.80	10.0	103.0	60.0	40	45.3		●
0990	9.90	10.0	103.0	60.2	40	45.3		●
1000	10.00	10.0	103.0	60.2	40	45.2		●
1010	10.10	12.0	118.0	68.4	45	53.3		●
1020	10.20	12.0	118.0	68.5	45	53.2		●
1030	10.30	12.0	118.0	68.6	45	53.2		●
1040	10.40	12.0	118.0	68.7	45	53.1		●
1050	10.50	12.0	118.0	68.8	45	53.0		●
1060	10.60	12.0	118.0	68.9	45	53.0		●
1070	10.70	12.0	118.0	69.0	45	52.9		●
1080	10.80	12.0	118.0	69.0	45	52.8		●
1090	10.90	12.0	118.0	69.1	45	52.8		●
1100	11.00	12.0	118.0	69.2	45	52.7		●
1110	11.10	12.0	118.0	69.3	45	52.6		●
1120	11.20	12.0	118.0	69.4	45	52.6		●

Application	Material	d_1 [mm]	v_c [m/min]	f [mm]	n [min ⁻¹]	v_f [mm/min]	Q [cm ³ /min]
	Steel < 500 N/mm ² 	11.50	140	0.2700	3875	1046	108.7
		11.70	140	0.2750	3810	1048	112.7
		12.00	140	0.2850	3715	1059	119.7
		12.50	140	0.2950	3565	1052	129.1
		13.00	140	0.3100	3430	1063	141.1
		14.00	140	0.3300	3185	1051	161.8
		15.00	140	0.3550	2970	1054	186.3
		15.50	140	0.3650	2875	1049	198.0
		16.00	140	0.3800	2785	1058	212.8
		16.00	140	0.3800	2785	1058	212.8
	Steel 500 - 850 N/mm ² 	11.50	110	0.2700	3045	822	85.4
		11.70	110	0.2750	2995	824	88.5
		12.00	110	0.2850	2920	832	94.1
		12.50	110	0.2950	2800	826	101.4
		13.00	110	0.3100	2695	836	110.9
		14.00	110	0.3300	2500	825	127.0
		15.00	110	0.3550	2335	829	146.5
		15.50	110	0.3650	2260	825	155.7
		16.00	110	0.3800	2190	832	167.3
		16.00	110	0.3800	2190	832	167.3
	Steel 850 - 1100 N/mm ² 	11.50	80	0.2050	2215	454	47.2
		11.70	80	0.2100	2175	457	49.1
		12.00	80	0.2150	2120	456	51.5
		12.50	80	0.2250	2035	458	56.2
		13.00	80	0.2350	1960	461	61.1
		14.00	80	0.2500	1820	455	70.0
		15.00	80	0.2700	1700	459	81.1
		15.50	80	0.2800	1645	461	86.9
		16.00	80	0.2900	1590	461	92.7
		16.00	80	0.2900	1590	461	92.7
	Steel 1100 - 1300 N/mm ² 	11.50	55	0.1750	1520	266	27.6
		11.70	55	0.1750	1495	262	28.1
		12.00	55	0.1800	1460	263	29.7
		12.50	55	0.1900	1400	266	32.6
		13.00	55	0.1950	1345	262	34.8
		14.00	55	0.2100	1250	263	40.4
		15.00	55	0.2250	1165	262	46.3
		15.50	55	0.2350	1130	266	50.1
		16.00	55	0.2400	1095	263	52.8
		16.00	55	0.2400	1095	263	52.8
	Steel 1300 - 1500 N/mm ² 	11.50	25	0.1150	690	79	8.2
		11.70	25	0.1150	680	78	8.4
		12.00	25	0.1200	665	80	9.0
		12.50	25	0.1250	635	79	9.7
		13.00	25	0.1300	610	79	10.5
		14.00	25	0.1400	570	80	12.3
		15.00	25	0.1500	530	80	14.0
		15.50	25	0.1550	515	80	15.1
		16.00	25	0.1600	495	79	15.9
		16.00	25	0.1600	495	79	15.9
	Cold work tool steel (12% Cr), high alloyed [1.2379] 	11.50	50	0.1500	1385	208	21.6
		11.70	50	0.1500	1360	204	21.9
		12.00	50	0.1550	1325	205	23.2
		12.50	50	0.1600	1275	204	25.0
		13.00	50	0.1650	1225	202	26.8
		14.00	50	0.1800	1135	204	31.4
		15.00	50	0.1950	1060	207	36.5
		15.50	50	0.2000	1025	205	38.7
		16.00	50	0.2050	995	204	41.0
		16.00	50	0.2050	995	204	41.0
	Cast iron (lamellar / spheroidal)  	11.50	160	0.2950	4430	1307	135.7
		11.70	160	0.3000	4355	1307	140.5
		12.00	160	0.3100	4245	1316	148.8
		12.50	160	0.3200	4075	1304	160.0
		13.00	160	0.3350	3920	1313	174.3
		14.00	160	0.3600	3640	1310	201.7
		15.00	160	0.3850	3395	1307	231.0
		15.50	160	0.4000	3285	1314	247.9
		16.00	160	0.4100	3185	1306	262.6
		16.00	160	0.4100	3185	1306	262.6
	Wrought aluminium alloys Si < 6% hardened 	11.50	220	0.2300	6090	1401	145.5
		11.70	220	0.2350	5985	1407	151.2
		12.00	220	0.2400	5835	1400	158.4
		12.50	220	0.2500	5600	1400	171.8
		13.00	220	0.2600	5385	1400	185.8
		14.00	220	0.2800	5000	1400	215.5
		15.00	220	0.3000	4670	1401	247.6
		15.50	220	0.3100	4520	1401	264.4
		16.00	220	0.3200	4375	1400	281.5
		16.00	220	0.3200	4375	1400	281.5

Spiral flute drills Supradrill® U

5xd



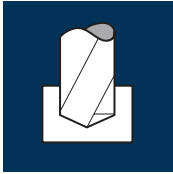
ReTool®

Rm <850 HRC <24	Rm 850-1100 HRC 24-34	Rm 1100-1300 HRC 34-42	Rm 1300-1500 HRC 42-48						GG(G) Aluminium
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Example: Order-Nº.							NANO-U²	
Article-Nº. ø-Code							B62014	
B62014 1130							B63014	
Ø Code	d1 m7	d2 h5	l1	l2	l4	Lmax		
1130	11.30	12.0	118.0	69.5	45	52.5		●
1140	11.40	12.0	118.0	69.6	45	52.5		●
1150	11.50	12.0	118.0	69.7	45	52.4		●
1160	11.60	12.0	118.0	69.8	45	52.4		●
1170	11.70	12.0	118.0	69.9	45	52.3		●
1180	11.80	12.0	118.0	70.0	45	52.3		●
1190	11.90	12.0	118.0	70.2	45	52.3		●
1200	12.00	12.0	118.0	70.2	45	52.2		●
1250	12.50	14.0	124.0	74.8	45	56.0		●
1280	12.80	14.0	124.0	75.0	45	55.8		●
1300	13.00	14.0	124.0	75.2	45	55.7		●
1350	13.50	14.0	124.0	75.6	45	55.4		●
1380	13.80	14.0	124.0	76.0	45	55.3		●
1400	14.00	14.0	124.0	76.2	45	55.2		●
1450	14.50	16.0	133.0	80.8	48	59.0		●
1480	14.80	16.0	133.0	81.0	48	58.8		●
1500	15.00	16.0	133.0	81.2	48	58.7		●
1550	15.50	16.0	133.0	81.6	48	58.4		●
1580	15.80	16.0	133.0	82.0	48	58.3		●
1600	16.00	16.0	133.0	82.2	48	58.2		●

Application

Material



Steel
< 500 N/mm²



Steel
500 - 850 N/mm²



Steel
850 - 1100 N/mm²



Steel
1100 - 1300 N/mm²



Steel
1300 - 1500 N/mm²



Cold work tool steel
(12% Cr),
high alloyed
[1.2379]



Titanium alloys
> 300 HB
[Ti6Al4V]



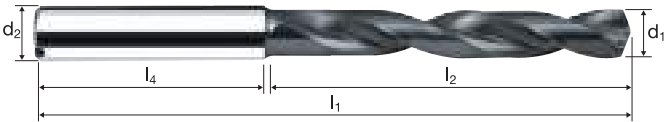
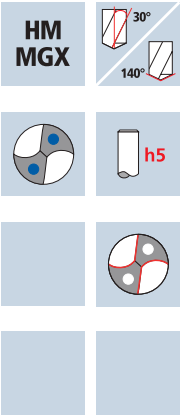
Cast iron
(lamellar / spheroidal)



d ₁ [mm]	v _c [m/min]	f [mm]	n [min ⁻¹]	v _f [mm/min]	Q [cm ³ /min]
3.00	180	0.1350	19100	2579	18.2
3.30	180	0.1450	17360	2517	21.5
3.50	180	0.1550	16370	2537	24.4
3.80	180	0.1700	15080	2564	29.1
4.00	180	0.1850	14325	2650	33.3
4.20	180	0.2000	13640	2728	37.8
4.50	180	0.2300	12730	2928	46.6
4.80	180	0.2450	11935	2924	52.9
5.00	180	0.2550	11460	2922	57.4
3.00	160	0.1150	16975	1952	13.8
3.30	160	0.1250	15435	1929	16.5
3.50	160	0.1350	14550	1964	18.9
3.80	160	0.1450	13405	1944	22.0
4.00	160	0.1600	12730	2037	25.6
4.20	160	0.1700	12125	2061	28.6
4.50	160	0.1950	11320	2207	35.1
4.80	160	0.2100	10610	2228	40.3
5.00	160	0.2150	10185	2190	43.0
3.00	140	0.1050	14855	1560	11.0
3.30	140	0.1150	13505	1553	13.3
3.50	140	0.1250	12730	1591	15.3
3.80	140	0.1350	11725	1583	18.0
4.00	140	0.1450	11140	1615	20.3
4.20	140	0.1550	10610	1645	22.8
4.50	140	0.1800	9905	1783	28.4
4.80	140	0.1900	9285	1764	31.9
5.00	140	0.2000	8915	1783	35.0
3.00	100	0.0800	10610	849	6.0
3.30	100	0.0900	9645	868	7.4
3.50	100	0.0950	9095	864	8.3
3.80	100	0.1000	8375	838	9.5
4.00	100	0.1100	7960	876	11.0
4.20	100	0.1200	7580	910	12.6
4.50	100	0.1350	7075	955	15.2
4.80	100	0.1450	6630	961	17.4
5.00	100	0.1500	6365	955	18.7
3.00	55	0.0600	5835	350	2.5
3.30	55	0.0700	5305	371	3.2
3.50	55	0.0700	5000	350	3.4
3.80	55	0.0800	4605	368	4.2
4.00	55	0.0850	4375	372	4.7
4.20	55	0.0900	4170	375	5.2
4.50	55	0.1050	3890	409	6.5
4.80	55	0.1100	3645	401	7.3
5.00	55	0.1150	3500	403	7.9
3.00	70	0.0600	7425	446	3.1
3.30	70	0.0700	6750	473	4.0
3.50	70	0.0700	6365	446	4.3
3.80	70	0.0800	5865	469	5.3
4.00	70	0.0850	5570	474	6.0
4.20	70	0.0900	5305	478	6.6
4.50	70	0.1050	4950	520	8.3
4.80	70	0.1100	4640	510	9.2
5.00	70	0.1150	4455	512	10.1
3.00	40	0.0600	4245	255	1.8
3.30	40	0.0700	3860	270	2.3
3.50	40	0.0700	3640	255	2.5
3.80	40	0.0800	3350	268	3.0
4.00	40	0.0850	3185	271	3.4
4.20	40	0.0900	3030	273	3.8
4.50	40	0.1050	2830	297	4.7
4.80	40	0.1100	2655	292	5.3
5.00	40	0.1150	2545	293	5.7
3.00	240	0.1200	25465	3056	21.6
3.30	240	0.1350	23150	3125	26.7
3.50	240	0.1400	21825	3056	29.4
3.80	240	0.1550	20105	3116	35.3
4.00	240	0.1650	19100	3152	39.6
4.20	240	0.1800	18190	3274	45.4
4.50	240	0.2050	16975	3480	55.3
4.80	240	0.2200	15915	3501	63.4
5.00	240	0.2300	15280	3514	69.0

Spiral flute drills XDrill®

5xd



ReTool®

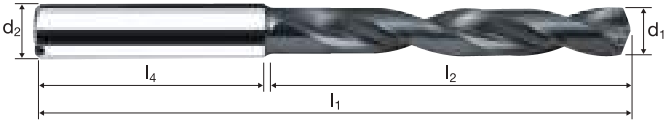
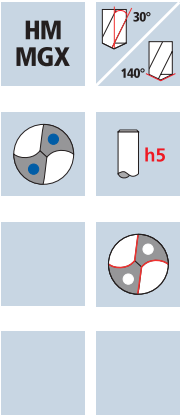
Rm <850 HRC <24	Rm 850-1100 HRC 24-34	Rm 1100-1300 HRC 34-42	Rm 1300-1500 HRC 42-48	HRC 48-56			Inox Stainless	Ti Titanium	GG(G)
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Example: Order-Nº.							DURO-X	
Article-Nº. ø-Code							B72015	
Order-Nº. B72015 0300								
Ø Code	d1 m7	d2 h5	l1	l2	l4	Lmax		
0300	3.00	6.0	66.0	24.7	36	20.2		●
0310	3.10	6.0	66.0	24.8	36	20.2		●
0320	3.20	6.0	66.0	24.8	36	20.0		●
0330	3.30	6.0	66.0	24.9	36	20.0		●
0340	3.40	6.0	66.0	24.9	36	19.8		●
0350	3.50	6.0	66.0	25.0	36	19.8		●
0360	3.60	6.0	66.0	25.0	36	19.6		●
0370	3.70	6.0	66.0	25.1	36	19.6		●
0380	3.80	6.0	74.0	33.1	36	27.4		●
0390	3.90	6.0	74.0	33.1	36	27.3		●
0400	4.00	6.0	74.0	32.9	36	26.9		●
0410	4.10	6.0	74.0	32.9	36	26.8		●
0420	4.20	6.0	74.0	33.0	36	26.7		●
0430	4.30	6.0	74.0	33.1	36	26.7		●
0440	4.40	6.0	74.0	33.2	36	26.6		●
0450	4.50	6.0	74.0	33.3	36	26.6		●
0460	4.60	6.0	74.0	33.4	36	26.5		●
0470	4.70	6.0	74.0	33.5	36	26.5		●
0480	4.80	6.0	82.0	41.5	36	34.3		●
0490	4.90	6.0	82.0	41.6	36	34.3		●
0500	5.00	6.0	82.0	42.2	36	34.7		●
0510	5.10	6.0	82.0	42.3	36	34.7		●
0520	5.20	6.0	82.0	42.4	36	34.6		●

Application	Material	d_1 [mm]	v_c [m/min]	f [mm]	n [min ⁻¹]	v_f [mm/min]	Q [cm ³ /min]
	Steel < 500 N/mm ² 	5.50	180	0.2800	10415	2916	69.3
		5.80	180	0.2950	9880	2915	77.0
		6.00	180	0.3150	9550	3008	85.1
		6.20	180	0.3350	9240	3095	93.5
		6.50	180	0.3500	8815	3085	102.4
		6.80	180	0.3650	8425	3075	111.7
		7.00	180	0.3800	8185	3110	119.7
		7.20	180	0.3900	7960	3104	126.4
		7.50	180	0.4050	7640	3094	136.7
		7.50	180	0.4050	7640	3094	136.7
	Steel 500 - 850 N/mm ²	5.50	160	0.2400	9260	2222	52.8
		5.80	160	0.2500	8780	2195	58.0
		6.00	160	0.2700	8490	2292	64.8
		6.20	160	0.2850	8215	2341	70.7
		6.50	160	0.3000	7835	2351	78.0
		6.80	160	0.3150	7490	2359	85.7
		7.00	160	0.3250	7275	2364	91.0
		7.20	160	0.3350	7075	2370	96.5
		7.50	160	0.3450	6790	2343	103.5
		7.50	160	0.3450	6790	2343	103.5
	Steel 850 - 1100 N/mm ²	5.50	140	0.2200	8100	1782	42.3
		5.80	140	0.2300	7685	1768	46.7
		6.00	140	0.2500	7425	1856	52.5
		6.20	140	0.2650	7190	1905	57.5
		6.50	140	0.2750	6855	1885	62.6
		6.80	140	0.2900	6555	1901	69.0
		7.00	140	0.3000	6365	1910	73.5
		7.20	140	0.3050	6190	1888	76.9
		7.50	140	0.3200	5940	1901	84.0
		7.50	140	0.3200	5940	1901	84.0
	Steel 1100 - 1300 N/mm ²	5.50	100	0.1650	5785	955	22.7
		5.80	100	0.1750	5490	961	25.4
		6.00	100	0.1900	5305	1008	28.5
		6.20	100	0.2000	5135	1027	31.0
		6.50	100	0.2100	4895	1028	34.1
		6.80	100	0.2200	4680	1030	37.4
		7.00	100	0.2250	4545	1023	39.4
		7.20	100	0.2350	4420	1039	42.3
		7.50	100	0.2450	4245	1040	45.9
		7.50	100	0.2450	4245	1040	45.9
	Steel 1300 - 1500 N/mm ²	5.50	55	0.1300	3185	414	9.8
		5.80	55	0.1350	3020	408	10.8
		6.00	55	0.1450	2920	423	12.0
		6.20	55	0.1550	2825	438	13.2
		6.50	55	0.1600	2695	431	14.3
		6.80	55	0.1700	2575	438	15.9
		7.00	55	0.1750	2500	438	16.8
		7.20	55	0.1800	2430	437	17.8
		7.50	55	0.1850	2335	432	19.1
		7.50	55	0.1850	2335	432	19.1
	Cold work tool steel (12% Cr), high alloyed [1.2379]	5.50	70	0.1300	4050	527	12.5
		5.80	70	0.1350	3840	518	13.7
		6.00	70	0.1450	3715	539	15.2
		6.20	70	0.1550	3595	557	16.8
		6.50	70	0.1600	3430	549	18.2
		6.80	70	0.1700	3275	557	20.2
		7.00	70	0.1750	3185	557	21.5
		7.20	70	0.1800	3095	557	22.7
		7.50	70	0.1850	2970	550	24.3
		7.50	70	0.1850	2970	550	24.3
	Titanium alloys > 300 HB [Ti6Al4V]	5.50	40	0.1300	2315	301	7.2
		5.80	40	0.1350	2195	296	7.8
		6.00	40	0.1450	2120	307	8.7
		6.20	40	0.1550	2055	319	9.6
		6.50	40	0.1600	1960	314	10.4
		6.80	40	0.1700	1870	318	11.5
		7.00	40	0.1750	1820	319	12.3
		7.20	40	0.1800	1770	319	13.0
		7.50	40	0.1850	1700	315	13.9
		7.50	40	0.1850	1700	315	13.9
 	Cast iron (lamellar / spheroidal)	5.50	240	0.2550	13890	3542	84.2
		5.80	240	0.2650	13170	3490	92.2
		6.00	240	0.2850	12730	3628	102.6
		6.20	240	0.3050	12320	3758	113.4
		6.50	240	0.3200	11755	3762	124.8
		6.80	240	0.3350	11235	3764	136.7
		7.00	240	0.3450	10915	3766	144.9
		7.20	240	0.3550	10610	3767	153.4
		7.50	240	0.3700	10185	3769	166.5
		7.50	240	0.3700	10185	3769	166.5

Spiral flute drills XDrill®

5xd



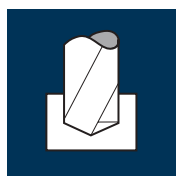
ReTool®

Rm <850 HRC <24	Rm 850-1100 HRC 24-34	Rm 1100-1300 HRC 34-42	Rm 1300-1500 HRC 42-48	HRC 48-56			Inox Stainless	Ti Titanium	GG(G)
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Example: Order-N°.							DURO-X	
Article-N°. ø-Code							B72015	
Order-N°. B72015 0530								
Ø Code	d1 m7	d2 h5	l1	l2	l4	Lmax		
0530	5.30	6.0	82.0	42.5	36	34.6		●
0540	5.40	6.0	82.0	42.6	36	34.5		●
0550	5.50	6.0	82.0	42.6	36	34.4		●
0560	5.60	6.0	82.0	42.7	36	34.3		●
0570	5.70	6.0	82.0	42.9	36	34.4		●
0580	5.80	6.0	82.0	43.0	36	34.3		●
0590	5.90	6.0	82.0	43.1	36	34.3		●
0600	6.00	6.0	82.0	43.3	36	34.3		●
0610	6.10	8.0	91.0	50.4	36	41.3		●
0620	6.20	8.0	91.0	50.5	36	41.2		●
0630	6.30	8.0	91.0	50.6	36	41.2		●
0640	6.40	8.0	91.0	50.7	36	41.1		●
0650	6.50	8.0	91.0	50.7	36	41.0		●
0660	6.60	8.0	91.0	50.8	36	40.9		●
0670	6.70	8.0	91.0	50.9	36	40.9		●
0680	6.80	8.0	91.0	51.0	36	40.8		●
0690	6.90	8.0	91.0	51.1	36	40.8		●
0700	7.00	8.0	91.0	51.2	36	40.7		●
0710	7.10	8.0	91.0	51.3	36	40.7		●
0720	7.20	8.0	91.0	51.4	36	40.6		●
0730	7.30	8.0	91.0	51.4	36	40.5		●
0740	7.40	8.0	91.0	51.5	36	40.4		●
0750	7.50	8.0	91.0	51.6	36	40.4		●

Application

Material



Steel
< 500 N/mm²



Steel
500 - 850 N/mm²



Steel
850 - 1100 N/mm²



Steel
1100 - 1300 N/mm²



Steel
1300 - 1500 N/mm²



Cold work tool steel
(12% Cr),
high alloyed
[1.2379]



Titanium alloys
> 300 HB
[Ti6Al4V]



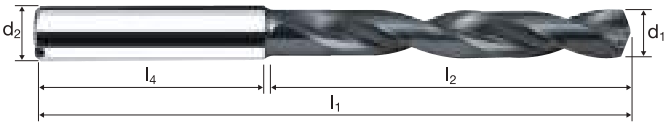
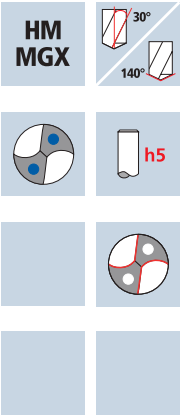
Cast iron
(lamellar / spheroidal)



d ₁ [mm]	v _c [m/min]	f [mm]	n [min ⁻¹]	v _f [mm/min]	Q [cm ³ /min]
7.60	180	0.4100	7540	3091	140.2
8.00	180	0.4300	7160	3079	154.8
8.20	180	0.4450	6985	3108	164.1
8.50	180	0.4600	6740	3100	175.9
8.80	180	0.4750	6510	3092	188.1
9.00	180	0.4850	6365	3087	196.4
9.20	180	0.4950	6230	3084	205.0
9.50	180	0.5150	6030	3106	220.1
9.80	180	0.5300	5845	3098	233.7
7.60	160	0.3500	6700	2345	106.4
8.00	160	0.3700	6365	2355	118.4
8.20	160	0.3800	6210	2360	124.6
8.50	160	0.3950	5990	2366	134.3
8.80	160	0.4050	5785	2343	142.5
9.00	160	0.4150	5660	2349	149.4
9.20	160	0.4250	5535	2352	156.4
9.50	160	0.4400	5360	2358	167.2
9.80	160	0.4550	5195	2364	178.3
7.60	140	0.3250	5865	1906	86.5
8.00	140	0.3400	5570	1894	95.2
8.20	140	0.3500	5435	1902	100.5
8.50	140	0.3600	5245	1888	107.1
8.80	140	0.3750	5065	1899	115.5
9.00	140	0.3850	4950	1906	121.2
9.20	140	0.3900	4845	1890	125.6
9.50	140	0.4050	4690	1900	134.6
9.80	140	0.4200	4545	1909	144.0
7.60	100	0.2450	4190	1027	46.6
8.00	100	0.2600	3980	1035	52.0
8.20	100	0.2650	3880	1028	54.3
8.50	100	0.2750	3745	1030	58.4
8.80	100	0.2850	3615	1030	62.7
9.00	100	0.2900	3535	1025	65.2
9.20	100	0.3000	3460	1038	69.0
9.50	100	0.3100	3350	1039	73.6
9.80	100	0.3200	3250	1040	78.4
7.60	55	0.1900	2305	438	19.9
8.00	55	0.2000	2190	438	22.0
8.20	55	0.2050	2135	438	23.1
8.50	55	0.2100	2060	433	24.5
8.80	55	0.2200	1990	438	26.6
9.00	55	0.2250	1945	438	27.8
9.20	55	0.2300	1905	438	29.1
9.50	55	0.2350	1845	434	30.7
9.80	55	0.2450	1785	437	33.0
7.60	70	0.1900	2930	557	25.3
8.00	70	0.2000	2785	557	28.0
8.20	70	0.2050	2715	557	29.4
8.50	70	0.2100	2620	550	31.2
8.80	70	0.2200	2530	557	33.9
9.00	70	0.2250	2475	557	35.4
9.20	70	0.2300	2420	557	37.0
9.50	70	0.2350	2345	551	39.1
9.80	70	0.2450	2275	557	42.0
7.60	40	0.1900	1675	318	14.4
8.00	40	0.2000	1590	318	16.0
8.20	40	0.2050	1555	319	16.8
8.50	40	0.2100	1500	315	17.9
8.80	40	0.2200	1445	318	19.3
9.00	40	0.2250	1415	318	20.3
9.20	40	0.2300	1385	319	21.2
9.50	40	0.2350	1340	315	22.3
9.80	40	0.2450	1300	319	24.0
7.60	240	0.3750	10050	3769	171.0
8.00	240	0.3950	9550	3772	189.6
8.20	240	0.4050	9315	3773	199.2
8.50	240	0.4150	8990	3731	211.7
8.80	240	0.4300	8680	3732	227.0
9.00	240	0.4400	8490	3736	237.6
9.20	240	0.4500	8305	3737	248.4
9.50	240	0.4650	8040	3739	265.0
9.80	240	0.4800	7795	3742	282.2

Spiral flute drills XDrill®

5xd



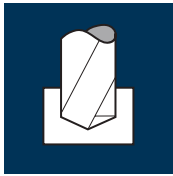
ReTool®

Rm <850 HRC <24	Rm 850-1100 HRC 24-34	Rm 1100-1300 HRC 34-42	Rm 1300-1500 HRC 42-48	HRC 48-56			Inox Stainless	Ti Titanium	GG(G)
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Example: Order-Nº. Article-Nº. B72015 ø-Code 0760								DURO-X
								B72015
Ø Code	d ₁ m7	d ₂ h5	l ₁	l ₂	l ₄	L _{max}		
0760	7.60	8.0	91.0	51.7	36	40.3		●
0770	7.70	8.0	91.0	51.8	36	40.3		●
0780	7.80	8.0	91.0	52.0	36	40.3		●
0790	7.90	8.0	91.0	52.1	36	40.3		●
0800	8.00	8.0	91.0	52.3	36	40.3		●
0810	8.10	10.0	103.0	58.4	40	46.3		●
0820	8.20	10.0	103.0	58.5	40	46.2		●
0830	8.30	10.0	103.0	58.6	40	46.2		●
0840	8.40	10.0	103.0	58.6	40	46.0		●
0850	8.50	10.0	103.0	58.7	40	46.0		●
0860	8.60	10.0	103.0	58.8	40	45.9		●
0870	8.70	10.0	103.0	58.9	40	45.9		●
0880	8.80	10.0	103.0	59.0	40	45.8		●
0890	8.90	10.0	103.0	59.1	40	45.8		●
0900	9.00	10.0	103.0	59.2	40	45.7		●
0910	9.10	10.0	103.0	59.2	40	45.6		●
0920	9.20	10.0	103.0	59.3	40	45.5		●
0930	9.30	10.0	103.0	59.4	40	45.5		●
0940	9.40	10.0	103.0	59.5	40	45.4		●
0950	9.50	10.0	103.0	59.6	40	45.4		●
0960	9.60	10.0	103.0	59.7	40	45.3		●
0970	9.70	10.0	103.0	59.8	40	45.3		●
0980	9.80	10.0	103.0	59.9	40	45.2		●

Application

Material



Steel
< 500 N/mm²



Steel
500 - 850 N/mm²



Steel
850 - 1100 N/mm²



Steel
1100 - 1300 N/mm²



Steel
1300 - 1500 N/mm²



Cold work tool steel
(12% Cr),
high alloyed
[1.2379]



Titanium alloys
> 300 HB
[Ti6Al4V]



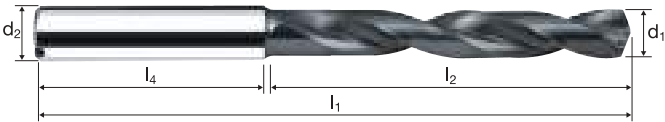
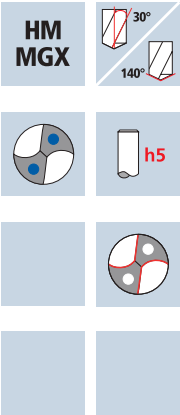
Cast iron
(lamellar / spheroidal)



d ₁ [mm]	v _c [m/min]	f [mm]	n [min ⁻¹]	v _f [mm/min]	Q [cm ³ /min]
10.00	180	0.5400	5730	3094	243.0
10.20	180	0.5450	5615	3060	250.1
10.50	180	0.5650	5455	3082	266.9
10.80	180	0.5750	5305	3050	279.4
11.00	180	0.5850	5210	3048	289.7
11.20	180	0.5850	5115	2992	294.8
11.50	180	0.5900	4980	2938	305.2
11.80	180	0.6000	4855	2913	318.6
12.00	180	0.6100	4775	2913	329.4
10.00	160	0.4650	5095	2369	186.1
10.20	160	0.4700	4995	2348	191.8
10.50	160	0.4850	4850	2352	203.7
10.80	160	0.4950	4715	2334	213.8
11.00	160	0.5000	4630	2315	220.0
11.20	160	0.5000	4545	2273	223.9
11.50	160	0.5050	4430	2237	232.4
11.80	160	0.5100	4315	2201	240.7
12.00	160	0.5200	4245	2207	249.7
10.00	140	0.4250	4455	1893	148.7
10.20	140	0.4300	4370	1879	153.5
10.50	140	0.4450	4245	1889	163.6
10.80	140	0.4550	4125	1877	171.9
11.00	140	0.4600	4050	1863	177.0
11.20	140	0.4650	3980	1851	182.3
11.50	140	0.4650	3875	1802	187.2
11.80	140	0.4700	3775	1774	194.0
12.00	140	0.4800	3715	1783	201.7
10.00	100	0.3250	3185	1035	81.3
10.20	100	0.3300	3120	1030	84.1
10.50	100	0.3400	3030	1030	89.2
10.80	100	0.3450	2945	1016	93.1
11.00	100	0.3500	2895	1013	96.3
11.20	100	0.3500	2840	994	97.9
11.50	100	0.3550	2770	983	102.1
11.80	100	0.3600	2700	972	106.3
12.00	100	0.3650	2655	969	109.6
10.00	55	0.2500	1750	438	34.4
10.20	55	0.2550	1715	437	35.7
10.50	55	0.2600	1665	433	37.5
10.80	55	0.2650	1620	429	39.3
11.00	55	0.2700	1590	429	40.8
11.20	55	0.2700	1565	423	41.6
11.50	55	0.2700	1520	410	42.6
11.80	55	0.2750	1485	408	44.7
12.00	55	0.2800	1460	409	46.2
10.00	70	0.2500	2230	558	43.8
10.20	70	0.2550	2185	557	45.5
10.50	70	0.2600	2120	551	47.7
10.80	70	0.2650	2065	547	50.1
11.00	70	0.2700	2025	547	52.0
11.20	70	0.2700	1990	537	52.9
11.50	70	0.2700	1940	524	54.4
11.80	70	0.2750	1890	520	56.8
12.00	70	0.2800	1855	519	58.7
10.00	40	0.2500	1275	319	25.0
10.20	40	0.2550	1250	319	26.1
10.50	40	0.2600	1215	316	27.4
10.80	40	0.2650	1180	313	28.6
11.00	40	0.2700	1155	312	29.6
11.20	40	0.2700	1135	307	30.2
11.50	40	0.2700	1105	298	31.0
11.80	40	0.2750	1080	297	32.5
12.00	40	0.2800	1060	297	33.6
10.00	240	0.4900	7640	3744	294.0
10.20	240	0.5000	7490	3745	306.0
10.50	240	0.5100	7275	3710	321.3
10.80	240	0.5250	7075	3714	340.3
11.00	240	0.5300	6945	3681	349.8
11.20	240	0.5350	6820	3649	359.5
11.50	240	0.5350	6645	3555	369.3
11.80	240	0.5450	6475	3529	385.9
12.00	240	0.5550	6365	3533	399.5

Spiral flute drills XDrill®

5xd

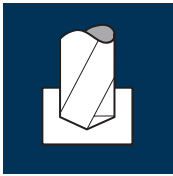


ReTool®

Rm <850 HRC <24	Rm 850-1100 HRC 24-34	Rm 1100-1300 HRC 34-42	Rm 1300-1500 HRC 42-48	HRC 48-56			Inox Stainless	Ti Titanium	GG(G)
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Example: Order-N°.							DURO-X	
Article-N°. ø-Code							B72015	
Order-N°. B72015 0990								
Ø Code	d ₁ m7	d ₂ h5	l ₁	l ₂	l ₄	L _{max}		
0990	9.90	10.0	103.0	60.1	40	45.3		●
1000	10.00	10.0	103.0	60.2	40	45.2		●
1010	10.10	12.0	118.0	68.3	45	53.2		●
1020	10.20	12.0	118.0	68.4	45	53.1		●
1030	10.30	12.0	118.0	68.5	45	53.1		●
1040	10.40	12.0	118.0	68.6	45	53.0		●
1050	10.50	12.0	118.0	68.7	45	53.0		●
1060	10.60	12.0	118.0	68.8	45	52.9		●
1070	10.70	12.0	118.0	68.9	45	52.9		●
1080	10.80	12.0	118.0	69.0	45	52.8		●
1090	10.90	12.0	118.0	69.0	45	52.7		●
1100	11.00	12.0	118.0	69.1	45	52.6		●
1110	11.10	12.0	118.0	69.2	45	52.6		●
1120	11.20	12.0	118.0	69.3	45	52.5		●
1130	11.30	12.0	118.0	69.4	45	52.5		●
1140	11.40	12.0	118.0	69.5	45	52.4		●
1150	11.50	12.0	118.0	69.6	45	52.4		●
1160	11.60	12.0	118.0	69.7	45	52.3		●
1170	11.70	12.0	118.0	69.8	45	52.3		●
1180	11.80	12.0	118.0	69.9	45	52.2		●
1190	11.90	12.0	118.0	70.0	45	52.2		●
1200	12.00	12.0	118.0	70.2	45	52.2		●

Application



Material

Steel
< 500 N/mm²



Steel
500 - 850 N/mm²



Steel
850 - 1100 N/mm²



Steel
1100 - 1300 N/mm²



Steel
1300 - 1500 N/mm²



Cold work tool steel
(12% Cr),
high alloyed
[1.2379]



Titanium alloys
> 300 HB
[Ti6Al4V]



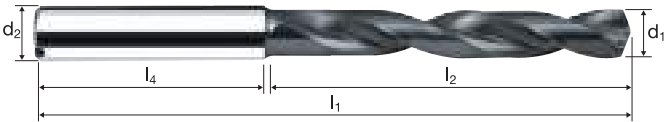
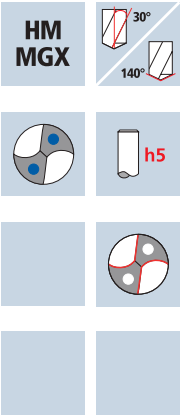
Cast iron
(lamellar / spheroidal)



d ₁ [mm]	v _c [m/min]	f [mm]	n [min ⁻¹]	v _f [mm/min]	Q [cm ³ /min]
12.20	180	0.6200	4695	2911	340.3
12.50	180	0.6350	4585	2912	357.3
12.60	180	0.6400	4545	2909	362.7
12.80	180	0.6500	4475	2909	374.3
13.00	180	0.6600	4405	2907	385.9
13.20	180	0.6700	4340	2908	397.9
13.50	180	0.6750	4245	2865	410.1
13.80	180	0.6750	4150	2801	419.0
14.00	180	0.6800	4095	2785	428.7
12.20	160	0.5300	4175	2213	258.7
12.50	160	0.5450	4075	2221	272.5
12.60	160	0.5450	4040	2202	274.5
12.80	160	0.5550	3980	2209	284.2
13.00	160	0.5650	3920	2215	294.0
13.20	160	0.5750	3860	2220	303.7
13.50	160	0.5800	3775	2190	313.4
13.80	160	0.5800	3690	2140	320.1
14.00	160	0.5850	3640	2129	327.8
12.20	140	0.4900	3655	1791	209.4
12.50	140	0.5000	3565	1783	218.7
12.60	140	0.5050	3535	1785	222.6
12.80	140	0.5100	3480	1775	228.4
13.00	140	0.5200	3430	1784	236.7
13.20	140	0.5300	3375	1789	244.8
13.50	140	0.5350	3300	1766	252.7
13.80	140	0.5350	3230	1728	258.5
14.00	140	0.5400	3185	1720	264.8
12.20	100	0.3700	2610	966	112.9
12.50	100	0.3800	2545	967	118.7
12.60	100	0.3850	2525	972	121.2
12.80	100	0.3900	2485	969	124.7
13.00	100	0.3950	2450	968	128.5
13.20	100	0.4000	2410	964	131.9
13.50	100	0.4050	2360	956	136.8
13.80	100	0.4050	2305	934	139.6
14.00	100	0.4100	2275	933	143.6
12.20	55	0.2850	1435	409	47.8
12.50	55	0.2900	1400	406	49.8
12.60	55	0.2950	1390	410	51.1
12.80	55	0.3000	1370	411	52.9
13.00	55	0.3050	1345	410	54.4
13.20	55	0.3100	1325	411	56.2
13.50	55	0.3100	1295	402	57.5
13.80	55	0.3100	1270	394	58.9
14.00	55	0.3150	1250	394	60.6
12.20	70	0.2850	1825	520	60.8
12.50	70	0.2900	1785	518	63.5
12.60	70	0.2950	1770	522	65.1
12.80	70	0.3000	1740	522	67.2
13.00	70	0.3050	1715	523	69.4
13.20	70	0.3100	1690	524	71.7
13.50	70	0.3100	1650	512	73.2
13.80	70	0.3100	1615	501	74.9
14.00	70	0.3150	1590	501	77.1
12.20	40	0.2850	1045	298	34.8
12.50	40	0.2900	1020	296	36.3
12.60	40	0.2950	1010	298	37.2
12.80	40	0.3000	995	299	38.4
13.00	40	0.3050	980	299	39.7
13.20	40	0.3100	965	299	40.9
13.50	40	0.3100	945	293	41.9
13.80	40	0.3100	925	287	42.9
14.00	40	0.3150	910	287	44.1
12.20	240	0.5600	6260	3506	409.8
12.50	240	0.5750	6110	3513	431.1
12.60	240	0.5800	6065	3518	438.6
12.80	240	0.5900	5970	3522	453.2
13.00	240	0.6000	5875	3525	467.9
13.20	240	0.6100	5785	3529	482.9
13.50	240	0.6150	5660	3481	498.3
13.80	240	0.6150	5535	3404	509.1
14.00	240	0.6200	5455	3382	520.6

Spiral flute drills XDrill®

5xd

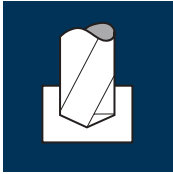


ReTool®

Rm <850 HRC <24	Rm 850-1100 HRC 24-34	Rm 1100-1300 HRC 34-42	Rm 1300-1500 HRC 42-48	HRC 48-56			Inox Stainless	Ti Titanium	GG(G)
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Example: Order-Nº.							DURO-X	
Article-Nº. ø-Code							B72015	
1210 1210								
Ø Code	d1 m7	d2 h5	l1	l2	l4	Lmax		
1210	12.10	14.0	124.0	74.3	45	56.2		●
1220	12.20	14.0	124.0	74.4	45	56.1		●
1230	12.30	14.0	124.0	74.5	45	56.1		●
1240	12.40	14.0	124.0	74.6	45	56.0		●
1250	12.50	14.0	124.0	74.7	45	56.0		●
1260	12.60	14.0	124.0	74.8	45	55.9		●
1270	12.70	14.0	124.0	74.8	45	55.8		●
1280	12.80	14.0	124.0	74.9	45	55.7		●
1290	12.90	14.0	124.0	75.0	45	55.7		●
1300	13.00	14.0	124.0	75.1	45	55.6		●
1310	13.10	14.0	124.0	75.2	45	55.6		●
1320	13.20	14.0	124.0	75.3	45	55.5		●
1330	13.30	14.0	124.0	75.4	45	55.5		●
1340	13.40	14.0	124.0	75.5	45	55.4		●
1350	13.50	14.0	124.0	75.5	45	55.3		●
1360	13.60	14.0	124.0	75.6	45	55.2		●
1370	13.70	14.0	124.0	75.7	45	55.2		●
1380	13.80	14.0	124.0	75.8	45	55.1		●
1390	13.90	14.0	124.0	76.0	45	55.2		●
1400	14.00	14.0	124.0	76.1	45	55.1		●

Application



Material

Steel
< 500 N/mm²



Steel
500 - 850 N/mm²



Steel
850 - 1100 N/mm²



Steel
1100 - 1300 N/mm²



Steel
1300 - 1500 N/mm²



Cold work tool steel
(12% Cr),
high alloyed
[1.2379]



Titanium alloys
> 300 HB
[Ti6Al4V]



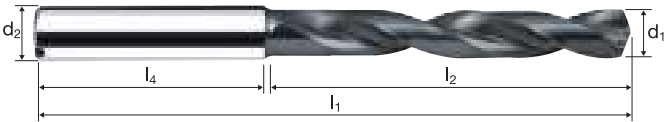
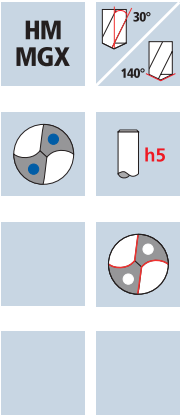
Cast iron
(lamellar / spheroidal)



d ₁ [mm]	v _c [m/min]	f [mm]	n [min ⁻¹]	v _f [mm/min]	Q [cm ³ /min]
14.20	180	0.6850	4035	2764	437.7
14.50	180	0.6900	3950	2726	450.1
14.80	180	0.7000	3870	2709	466.0
15.00	180	0.7100	3820	2712	479.3
15.20	180	0.7200	3770	2714	492.6
15.50	180	0.7250	3695	2679	505.5
15.70	180	0.7250	3650	2646	512.3
15.80	180	0.7300	3625	2646	518.9
16.00	180	0.7350	3580	2631	529.1
14.20	160	0.5900	3585	2115	335.0
14.50	160	0.5900	3510	2071	342.0
14.80	160	0.6000	3440	2064	355.1
15.00	160	0.6100	3395	2071	366.0
15.20	160	0.6150	3350	2060	373.9
15.50	160	0.6200	3285	2037	384.3
15.70	160	0.6250	3245	2028	392.6
15.80	160	0.6250	3225	2016	395.2
16.00	160	0.6300	3185	2007	403.5
14.20	140	0.5400	3140	1696	268.5
14.50	140	0.5450	3075	1676	276.7
14.80	140	0.5550	3010	1671	287.4
15.00	140	0.5600	2970	1663	293.9
15.20	140	0.5700	2930	1670	303.1
15.50	140	0.5700	2875	1639	309.2
15.70	140	0.5750	2840	1633	316.1
15.80	140	0.5800	2820	1636	320.7
16.00	140	0.5800	2785	1615	324.8
14.20	100	0.4100	2240	918	145.4
14.50	100	0.4150	2195	911	150.4
14.80	100	0.4200	2150	903	155.3
15.00	100	0.4250	2120	901	159.2
15.20	100	0.4300	2095	901	163.5
15.50	100	0.4350	2055	894	168.7
15.70	100	0.4350	2025	881	170.5
15.80	100	0.4400	2015	887	173.8
16.00	100	0.4400	1990	876	176.0
14.20	55	0.3150	1235	389	61.6
14.50	55	0.3200	1205	386	63.7
14.80	55	0.3250	1185	385	66.3
15.00	55	0.3300	1165	385	67.9
15.20	55	0.3300	1150	380	68.9
15.50	55	0.3350	1130	379	71.4
15.70	55	0.3350	1115	374	72.3
15.80	55	0.3400	1110	377	74.0
16.00	55	0.3400	1095	372	74.9
14.20	70	0.3150	1570	495	78.3
14.50	70	0.3200	1535	491	81.1
14.80	70	0.3250	1505	489	84.1
15.00	70	0.3300	1485	490	86.6
15.20	70	0.3300	1465	484	87.7
15.50	70	0.3350	1440	482	91.0
15.70	70	0.3350	1420	476	92.1
15.80	70	0.3400	1410	479	94.0
16.00	70	0.3400	1395	474	95.4
14.20	40	0.3150	895	282	44.6
14.50	40	0.3200	880	282	46.5
14.80	40	0.3250	860	280	48.1
15.00	40	0.3300	850	281	49.6
15.20	40	0.3300	840	277	50.3
15.50	40	0.3350	820	275	51.8
15.70	40	0.3350	810	271	52.5
15.80	40	0.3400	805	274	53.7
16.00	40	0.3400	795	270	54.3
14.20	240	0.6250	5380	3363	532.5
14.50	240	0.6300	5270	3320	548.2
14.80	240	0.6350	5160	3277	563.7
15.00	240	0.6450	5095	3286	580.7
15.20	240	0.6550	5025	3291	597.3
15.50	240	0.6600	4930	3254	614.0
15.70	240	0.6600	4865	3211	621.6
15.80	240	0.6650	4835	3215	630.4
16.00	240	0.6700	4775	3199	643.3

Spiral flute drills XDrill®

5xd



ReTool®

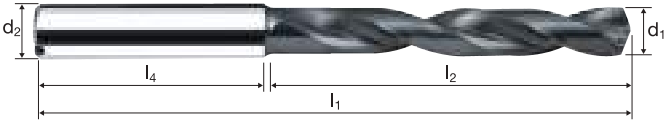
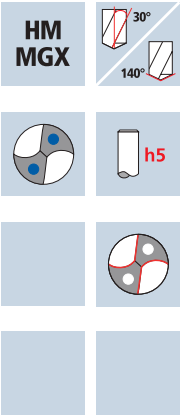
Rm <850 HRC <24	Rm 850-1100 HRC 24-34	Rm 1100-1300 HRC 34-42	Rm 1300-1500 HRC 42-48	HRC 48-56			Inox Stainless	Ti Titanium	GG(G)
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Example: Order-Nº. Article-Nº. B72015 ø-Code 1410								DURO-X
								B72015
Ø Code	d ₁ m7	d ₂ h5	l ₁	l ₂	l ₄	L _{max}		
1410	14.10	16.0	133.0	80.3	48	59.2		●
1420	14.20	16.0	133.0	80.4	48	59.1		●
1430	14.30	16.0	133.0	80.5	48	59.1		●
1440	14.40	16.0	133.0	80.6	48	59.0		●
1450	14.50	16.0	133.0	80.7	48	59.0		●
1460	14.60	16.0	133.0	80.7	48	58.8		●
1470	14.70	16.0	133.0	80.8	48	58.8		●
1480	14.80	16.0	133.0	80.9	48	58.7		●
1490	14.90	16.0	133.0	81.0	48	58.7		●
1500	15.00	16.0	133.0	81.1	48	58.6		●
1510	15.10	16.0	133.0	81.2	48	58.6		●
1520	15.20	16.0	133.0	81.3	48	58.5		●
1530	15.30	16.0	133.0	81.4	48	58.5		●
1540	15.40	16.0	133.0	81.4	48	58.3		●
1550	15.50	16.0	133.0	81.5	48	58.3		●
1560	15.60	16.0	133.0	81.6	48	58.2		●
1570	15.70	16.0	133.0	81.7	48	58.2		●
1580	15.80	16.0	133.0	81.8	48	58.1		●
1590	15.90	16.0	133.0	81.9	48	58.1		●
1600	16.00	16.0	133.0	82.1	48	58.1		●

Application	Material	d_1 [mm]	v_c [m/min]	f [mm]	n [min ⁻¹]	v_f [mm/min]	Q [cm ³ /min]
	Steel < 500 N/mm ² 	16.20	180	0.7400	3535	2616	539.2
		16.40	180	0.7500	3495	2621	553.7
		16.50	180	0.7550	3470	2620	560.2
		16.80	180	0.7550	3410	2575	570.7
		17.00	180	0.7600	3370	2561	581.3
		17.20	180	0.7650	3330	2548	591.9
		17.50	180	0.7700	3275	2522	606.6
		17.70	180	0.7750	3235	2507	616.9
		18.00	180	0.7800	3185	2484	632.2
	Steel 500 - 850 N/mm ² 	16.20	160	0.6350	3145	1997	411.6
		16.40	160	0.6400	3105	1987	419.8
		16.50	160	0.6450	3085	1990	425.5
		16.80	160	0.6500	3030	1970	436.6
		17.00	160	0.6500	2995	1947	441.9
		17.20	160	0.6550	2960	1939	450.5
		17.50	160	0.6600	2910	1921	462.0
		17.70	160	0.6600	2875	1898	466.9
		18.00	160	0.6700	2830	1896	482.5
	Steel 850 - 1100 N/mm ² 	16.20	140	0.5850	2750	1609	331.6
		16.40	140	0.5900	2715	1602	338.4
		16.50	140	0.5950	2700	1607	343.5
		16.80	140	0.5950	2655	1580	350.2
		17.00	140	0.6000	2620	1572	356.8
		17.20	140	0.6000	2590	1554	361.1
		17.50	140	0.6100	2545	1553	373.4
		17.70	140	0.6100	2520	1537	378.2
		18.00	140	0.6150	2475	1522	387.3
	Steel 1100 - 1300 N/mm ² 	16.20	100	0.4450	1965	874	180.2
		16.40	100	0.4500	1940	873	184.4
		16.50	100	0.4500	1930	869	185.7
		16.80	100	0.4550	1895	862	191.1
		17.00	100	0.4550	1870	851	193.1
		17.20	100	0.4600	1850	851	197.7
		17.50	100	0.4600	1820	837	201.4
		17.70	100	0.4650	1800	837	206.0
		18.00	100	0.4700	1770	832	211.7
	Steel 1300 - 1500 N/mm ² 	16.20	55	0.3400	1080	367	75.7
		16.40	55	0.3450	1070	369	78.0
		16.50	55	0.3500	1060	371	79.3
		16.80	55	0.3500	1040	364	80.7
		17.00	55	0.3500	1030	361	81.8
		17.20	55	0.3500	1020	357	82.9
		17.50	55	0.3550	1000	355	85.4
		17.70	55	0.3550	990	352	86.5
		18.00	55	0.3600	975	351	89.3
	Cold work tool steel (12% Cr), high alloyed [1.2379] 	16.20	70	0.3400	1375	468	96.4
		16.40	70	0.3450	1360	469	99.1
		16.50	70	0.3500	1350	473	101.0
		16.80	70	0.3500	1325	464	102.8
		17.00	70	0.3500	1310	459	104.1
		17.20	70	0.3500	1295	453	105.3
		17.50	70	0.3550	1275	453	108.9
		17.70	70	0.3550	1260	447	110.1
		18.00	70	0.3600	1240	446	113.6
	Titanium alloys > 300 HB [Ti6Al4V] 	16.20	40	0.3400	785	267	55.0
		16.40	40	0.3450	775	267	56.5
		16.50	40	0.3500	770	270	57.6
		16.80	40	0.3500	760	266	59.0
		17.00	40	0.3500	750	263	59.6
		17.20	40	0.3500	740	259	60.2
		17.50	40	0.3550	730	259	62.3
		17.70	40	0.3550	720	256	62.9
		18.00	40	0.3600	705	254	64.6
	Cast iron (lamellar / spheroidal)  	16.20	240	0.6750	4715	3183	656.0
		16.40	240	0.6800	4660	3169	669.4
		16.50	240	0.6850	4630	3172	678.2
		16.80	240	0.6850	4545	3113	690.1
		17.00	240	0.6900	4495	3102	704.0
		17.20	240	0.6950	4440	3086	717.0
		17.50	240	0.7000	4365	3056	734.9
		17.70	240	0.7050	4315	3042	748.5
		18.00	240	0.7100	4245	3014	767.0

Spiral flute drills XDrill®

5xd



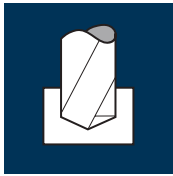
ReTool®

Rm <850 HRC <24	Rm 850-1100 HRC 24-34	Rm 1100-1300 HRC 34-42	Rm 1300-1500 HRC 42-48	HRC 48-56			Inox Stainless	Ti Titanium	GG(G)
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Example: Order-Nº.							DURO-X	
Article-Nº. ø-Code							B72015	
1610 1610								
Ø Code	d1 m7	d2 h5	l1	l2	l4	Lmax		
1610	16.10	18.0	143.0	90.3	48	66.2		●
1620	16.20	18.0	143.0	90.4	48	66.1		●
1630	16.30	18.0	143.0	90.5	48	66.1		●
1640	16.40	18.0	143.0	90.5	48	65.9		●
1650	16.50	18.0	143.0	90.6	48	65.9		●
1660	16.60	18.0	143.0	90.7	48	65.8		●
1670	16.70	18.0	143.0	90.8	48	65.8		●
1680	16.80	18.0	143.0	90.9	48	65.7		●
1690	16.90	18.0	143.0	91.0	48	65.7		●
1700	17.00	18.0	143.0	91.1	48	65.6		●
1710	17.10	18.0	143.0	91.1	48	65.5		●
1720	17.20	18.0	143.0	91.2	48	65.4		●
1730	17.30	18.0	143.0	91.3	48	65.4		●
1740	17.40	18.0	143.0	91.4	48	65.3		●
1750	17.50	18.0	143.0	91.5	48	65.3		●
1760	17.60	18.0	143.0	91.6	48	65.2		●
1770	17.70	18.0	143.0	91.7	48	65.2		●
1780	17.80	18.0	143.0	91.8	48	65.1		●
1790	17.90	18.0	143.0	91.9	48	65.1		●
1800	18.00	18.0	143.0	92.0	48	65.0		●

Application

Material



Steel
< 500 N/mm²



Steel
500 - 850 N/mm²



Steel
850 - 1100 N/mm²



Steel
1100 - 1300 N/mm²



Steel
1300 - 1500 N/mm²



Cold work tool steel
(12% Cr),
high alloyed
[1.2379]



Titanium alloys
> 300 HB
[Ti6Al4V]

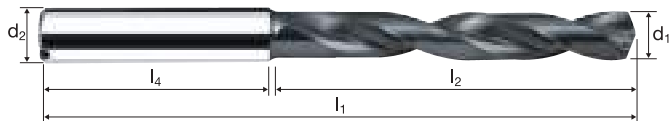


Cast iron
(lamellar / spheroidal)



d ₁ [mm]	v _c [m/min]	f [mm]	n [min ⁻¹]	v _f [mm/min]	Q [cm ³ /min]
18.50	180	0.7850	3095	2430	653.1
18.70	180	0.7850	3065	2406	660.8
19.00	180	0.7900	3015	2382	675.3
19.20	180	0.7950	2985	2373	687.1
19.30	180	0.8000	2970	2376	695.1
19.50	180	0.8050	2940	2367	706.8
19.70	180	0.8100	2910	2357	718.5
19.80	180	0.8100	2895	2345	722.0
20.00	180	0.8200	2865	2349	738.1
18.50	160	0.6700	2755	1846	496.2
18.70	160	0.6750	2725	1839	505.2
19.00	160	0.6800	2680	1822	516.7
19.20	160	0.6800	2655	1805	522.7
19.30	160	0.6850	2640	1808	529.1
19.50	160	0.6900	2610	1801	537.8
19.70	160	0.6900	2585	1784	543.7
19.80	160	0.6950	2570	1786	550.0
20.00	160	0.7050	2545	1794	563.7
18.50	140	0.6200	2410	1494	401.6
18.70	140	0.6200	2385	1479	406.1
19.00	140	0.6250	2345	1466	415.5
19.20	140	0.6250	2320	1450	419.8
19.30	140	0.6300	2310	1455	425.8
19.50	140	0.6350	2285	1451	433.3
19.70	140	0.6400	2260	1446	440.9
19.80	140	0.6400	2250	1440	443.4
20.00	140	0.6450	2230	1438	451.9
18.50	100	0.4700	1720	808	217.3
18.70	100	0.4700	1700	799	219.4
19.00	100	0.4750	1675	796	225.6
19.20	100	0.4750	1660	789	228.3
19.30	100	0.4800	1650	792	231.7
19.50	100	0.4850	1630	791	236.1
19.70	100	0.4850	1615	783	238.8
19.80	100	0.4850	1610	781	240.4
20.00	100	0.4900	1590	779	244.8
18.50	55	0.3600	945	340	91.4
18.70	55	0.3600	935	337	92.4
19.00	55	0.3650	920	336	95.2
19.20	55	0.3650	910	332	96.2
19.30	55	0.3700	905	335	98.0
19.50	55	0.3700	900	333	99.4
19.70	55	0.3750	890	334	101.7
19.80	55	0.3750	885	332	102.2
20.00	55	0.3800	875	333	104.5
18.50	70	0.3600	1205	434	116.6
18.70	70	0.3600	1190	428	117.7
19.00	70	0.3650	1175	429	121.6
19.20	70	0.3650	1160	423	122.6
19.30	70	0.3700	1155	427	125.0
19.50	70	0.3700	1145	424	126.5
19.70	70	0.3750	1130	424	129.2
19.80	70	0.3750	1125	422	129.9
20.00	70	0.3800	1115	424	133.1
18.50	40	0.3600	690	248	66.8
18.70	40	0.3600	680	245	67.2
19.00	40	0.3650	670	245	69.4
19.20	40	0.3650	665	243	70.3
19.30	40	0.3700	660	244	71.4
19.50	40	0.3700	655	242	72.4
19.70	40	0.3750	645	242	73.7
19.80	40	0.3750	645	242	74.5
20.00	40	0.3800	635	241	75.8
18.50	240	0.7100	4130	2932	788.2
18.70	240	0.7150	4085	2921	802.2
19.00	240	0.7200	4020	2894	820.6
19.20	240	0.7200	3980	2866	829.7
19.30	240	0.7250	3960	2871	839.9
19.50	240	0.7350	3920	2881	860.5
19.70	240	0.7350	3880	2852	869.2
19.80	240	0.7400	3860	2856	879.5
20.00	240	0.7450	3820	2846	894.1

5xd



ReTool®

Rm ≤ 850 HRC ≤ 24	Rm 850-1100 HRC 24-34	Rm 1100-1300 HRC 34-42	Rm 1300-1500 HRC 42-48	HRC 48-56			Inox Stainless	Ti Titanium	GG(G)
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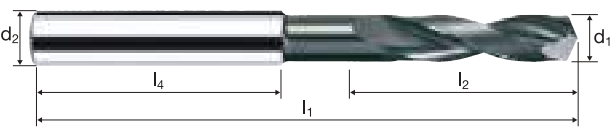
[illegible]

Application	Material	d_1 [mm]	v_c [m/min]	f [mm]	n [min ⁻¹]	v_f [mm/min]	Q [cm ³ /min]
	Steel < 500 N/mm ² 	3.00	170	0.0850	18040	1533	10.8
		3.30	170	0.0950	16400	1558	13.3
		3.50	170	0.1000	15460	1546	14.9
		4.00	170	0.1150	13530	1556	19.6
		4.20	170	0.1200	12885	1546	21.4
		5.00	170	0.1450	10825	1570	30.8
		6.00	170	0.1700	9020	1533	43.4
		6.80	170	0.1950	7960	1552	56.4
		8.50	170	0.2450	6365	1559	88.5
		3.00	130	0.0850	13795	1173	8.3
	Steel 500 - 850 N/mm ² 	3.30	130	0.0950	12540	1191	10.2
		3.50	130	0.1000	11825	1183	11.4
		4.00	130	0.1150	10345	1190	15.0
		4.20	130	0.1200	9850	1182	16.4
		5.00	130	0.1450	8275	1200	23.6
		6.00	130	0.1700	6895	1172	33.1
		6.80	130	0.1950	6085	1187	43.1
		8.50	130	0.2450	4870	1193	67.7
		3.00	110	0.0650	11670	759	5.4
		3.30	110	0.0750	10610	796	6.8
	Steel 850 - 1100 N/mm ² 	3.50	110	0.0800	10005	800	7.7
		4.00	110	0.0900	8755	788	9.9
		4.20	110	0.0950	8335	792	11.0
		5.00	110	0.1100	7005	771	15.1
		6.00	110	0.1350	5835	788	22.3
		6.80	110	0.1500	5150	773	28.1
		8.50	110	0.1900	4120	783	44.4
		3.00	70	0.0550	7425	408	2.9
		3.30	70	0.0600	6750	405	3.5
		3.50	70	0.0600	6365	382	3.7
	Steel 1100 - 1300 N/mm ² 	4.00	70	0.0700	5570	390	4.9
		4.20	70	0.0750	5305	398	5.5
		5.00	70	0.0900	4455	401	7.9
		6.00	70	0.1050	3715	390	11.0
		6.80	70	0.1200	3275	393	14.3
		8.50	70	0.1500	2620	393	22.3
		3.00	40	0.0450	4245	191	1.4
		3.30	40	0.0450	3860	174	1.5
		3.50	40	0.0500	3640	182	1.8
		4.00	40	0.0550	3185	175	2.2
	Steel 1300 - 1500 N/mm ² 	4.20	40	0.0600	3030	182	2.5
		5.00	40	0.0700	2545	178	3.5
		6.00	40	0.0850	2120	180	5.1
		6.80	40	0.0950	1870	178	6.5
		8.50	40	0.1200	1500	180	10.2
		3.00	60	0.0450	6365	286	2.0
		3.30	60	0.0500	5785	289	2.5
		3.50	60	0.0500	5455	273	2.6
		4.00	60	0.0600	4775	287	3.6
		4.20	60	0.0650	4545	295	4.1
	Stainless steel [Cr-Ni/1.4301] 	5.00	60	0.0750	3820	287	5.6
		6.00	60	0.0900	3185	287	8.1
		6.80	60	0.1000	2810	281	10.2
		8.50	60	0.1250	2245	281	15.9
		3.00	220	0.0950	23345	2218	15.7
		3.30	220	0.1050	21220	2228	19.1
		3.50	220	0.1100	20010	2201	21.2
		4.00	220	0.1250	17505	2188	27.5
		4.20	220	0.1300	16675	2168	30.0
		5.00	220	0.1550	14005	2171	42.6
	Cast iron (lamellar / spheroidal) 	6.00	220	0.1900	11670	2217	62.7
		6.80	220	0.2150	10300	2215	80.4
		8.50	220	0.2650	8240	2184	123.9
		3.00	250	0.0850	26525	2255	15.9
		3.30	250	0.0950	24115	2291	19.6
		3.50	250	0.1000	22735	2274	21.9
		4.00	250	0.1150	19895	2288	28.8
		4.20	250	0.1200	18945	2273	31.5
		5.00	250	0.1450	15915	2308	45.3
		6.00	250	0.1700	13265	2255	63.8
	Wrought aluminium alloys Si < 6% hardened 	6.80	250	0.1950	11705	2283	82.9
		8.50	250	0.2450	9360	2293	130.1

Spiral flute drills Supradrill® U

3xd

HM
MG10



ReTool®

Rm
<850
HRC
<24

Rm
850-1100
HRC
24-34

Rm
1100-1300
HRC
34-42

Rm
1300-1500
HRC
42-48

Inox
Stainless

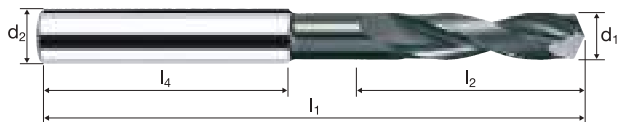
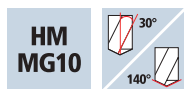
GG(G)
Aluminium

Example: Order-N°.							NANO-U ²	
Article-N°.							B62011	
ø-Code							B63011	
Ø Code	d ₁ m7	d ₂ h5	l ₁	l ₂	l ₄	L _{max}		
0300	3.00	6.0	62.0	20.7	36	16.2		●
0330	3.30	6.0	62.0	20.9	36	15.9		●
0340	3.40	6.0	62.0	20.9	36	15.8		●
0350	3.50	6.0	62.0	21.0	36	15.7		●
0370	3.70	6.0	62.0	21.1	36	15.5		●
0380	3.80	6.0	66.0	25.1	36	19.4		●
0400	4.00	6.0	66.0	24.9	36	18.9		●
0420	4.20	6.0	66.0	25.1	36	18.8		●
0450	4.50	6.0	66.0	25.4	36	18.6		●
0480	4.80	6.0	66.0	25.6	36	18.4		●
0500	5.00	6.0	66.0	25.8	36	18.3		●
0550	5.50	6.0	66.0	26.7	36	18.5		●
0580	5.80	6.0	66.0	27.1	36	18.4		●
0600	6.00	6.0	66.0	27.2	36	18.2		●
0650	6.50	8.0	79.0	38.8	36	29.1		●
0680	6.80	8.0	79.0	39.1	36	28.9		●
0700	7.00	8.0	79.0	39.3	36	28.8		●
0750	7.50	8.0	79.0	39.7	36	28.5		●
0780	7.80	8.0	79.0	40.1	36	28.4		●
0800	8.00	8.0	79.0	40.3	36	28.3		●
0850	8.50	10.0	89.0	44.8	40	32.1		●
0880	8.80	10.0	89.0	45.1	40	31.9		●
0900	9.00	10.0	89.0	45.3	40	31.8		●

Application	Material	d_1 [mm]	v_c [m/min]	f [mm]	n [min ⁻¹]	v_f [mm/min]	Q [cm ³ /min]
	Steel < 500 N/mm ² 	10.00	170	0.2850	5410	1542	121.1
		10.20	170	0.2900	5305	1539	125.7
		11.00	170	0.3150	4920	1550	147.3
		12.00	170	0.3450	4510	1556	176.0
		13.00	170	0.3700	4165	1541	204.6
		14.00	170	0.4000	3865	1546	238.0
		15.00	170	0.4300	3610	1552	274.3
		15.50	170	0.4450	3490	1553	293.1
		16.00	170	0.4550	3380	1538	309.2
		16.00	170	0.4550	3380	1538	309.2
	Steel 500 - 850 N/mm ² 	10.00	130	0.2850	4140	1180	92.7
		10.20	130	0.2900	4055	1176	96.1
		11.00	130	0.3150	3760	1184	112.6
		12.00	130	0.3450	3450	1190	134.6
		13.00	130	0.3700	3185	1179	156.4
		14.00	130	0.4000	2955	1182	182.0
		15.00	130	0.4300	2760	1187	209.7
		15.50	130	0.4450	2670	1188	224.2
		16.00	130	0.4550	2585	1176	236.5
		16.00	130	0.4550	2585	1176	236.5
	Steel 850 - 1100 N/mm ² 	10.00	110	0.2200	3500	770	60.5
		10.20	110	0.2250	3435	773	63.2
		11.00	110	0.2450	3185	780	74.2
		12.00	110	0.2650	2920	774	87.5
		13.00	110	0.2900	2695	782	103.7
		14.00	110	0.3100	2500	775	119.3
		15.00	110	0.3350	2335	782	138.2
		15.50	110	0.3450	2260	780	147.1
		16.00	110	0.3550	2190	778	156.3
		16.00	110	0.3550	2190	778	156.3
	Steel 1100 - 1300 N/mm ² 	10.00	70	0.1750	2230	390	30.7
		10.20	70	0.1800	2185	393	32.1
		11.00	70	0.1950	2025	395	37.5
		12.00	70	0.2100	1855	390	44.1
		13.00	70	0.2300	1715	395	52.4
		14.00	70	0.2450	1590	390	60.0
		15.00	70	0.2650	1485	394	69.5
		15.50	70	0.2700	1440	389	73.4
		16.00	70	0.2800	1395	391	78.5
		16.00	70	0.2800	1395	391	78.5
	Steel 1300 - 1500 N/mm ² 	10.00	40	0.1450	1275	185	14.5
		10.20	40	0.1450	1250	181	14.8
		11.00	40	0.1550	1155	179	17.0
		12.00	40	0.1700	1060	180	20.4
		13.00	40	0.1850	980	181	24.1
		14.00	40	0.2000	910	182	28.0
		15.00	40	0.2150	850	183	32.3
		15.50	40	0.2200	820	180	34.0
		16.00	40	0.2300	795	183	36.8
		16.00	40	0.2300	795	183	36.8
	Stainless steel [Cr-Ni/1.4301] 	10.00	60	0.1500	1910	287	22.5
		10.20	60	0.1500	1870	281	22.9
		11.00	60	0.1650	1735	286	27.2
		12.00	60	0.1800	1590	286	32.4
		13.00	60	0.1950	1470	287	38.1
		14.00	60	0.2100	1365	287	44.1
		15.00	60	0.2250	1275	287	50.7
		15.50	60	0.2300	1230	283	53.4
		16.00	60	0.2400	1195	287	57.7
		16.00	60	0.2400	1195	287	57.7
	Cast iron (lamellar / spheroidal) 	10.00	220	0.3150	7005	2207	173.3
		10.20	220	0.3200	6865	2197	179.5
		11.00	220	0.3450	6365	2196	208.7
		12.00	220	0.3750	5835	2188	247.5
		13.00	220	0.4050	5385	2181	289.5
		14.00	220	0.4400	5000	2200	338.7
		15.00	220	0.4700	4670	2195	387.9
		15.50	220	0.4850	4520	2192	413.7
		16.00	220	0.5000	4375	2188	439.8
		16.00	220	0.5000	4375	2188	439.8
	Wrought aluminium alloys Si < 6% hardened 	10.00	250	0.2850	7960	2269	178.2
		10.20	250	0.2900	7800	2262	184.8
		11.00	250	0.3150	7235	2279	216.6
		12.00	250	0.3450	6630	2287	258.7
		13.00	250	0.3700	6120	2264	300.6
		14.00	250	0.4000	5685	2274	350.1
		15.00	250	0.4300	5305	2281	403.1
		15.50	250	0.4450	5135	2285	431.2
		16.00	250	0.4550	4975	2264	455.1
		16.00	250	0.4550	4975	2264	455.1

Spiral flute drills Supradrill® U

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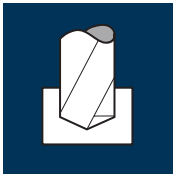
Rm <850 HRC <24	Rm 850-1100 HRC 24-34	Rm 1100-1300 HRC 34-42	Rm 1300-1500 HRC 42-48				Inox Stainless		GG(G) Aluminium
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Example: Order-N°. B62011 0950							NANO-U ²	
							B62011	
							B63011	
Ø Code	d ₁ m7	d ₂ h5	l ₁	l ₂	l ₄	L _{max}		
0950	9.50	10.0	89.0	45.7	40	31.5		●
0980	9.80	10.0	89.0	46.1	40	31.4		●
1000	10.00	10.0	89.0	46.3	40	31.3		●
1020	10.20	12.0	102.0	52.5	45	37.2		●
1050	10.50	12.0	102.0	52.8	45	37.1		●
1080	10.80	12.0	102.0	53.1	45	36.9		●
1100	11.00	12.0	102.0	53.2	45	36.7		●
1150	11.50	12.0	102.0	53.7	45	36.4		●
1180	11.80	12.0	102.0	54.0	45	36.3		●
1200	12.00	12.0	102.0	54.3	45	36.3		●
1250	12.50	14.0	107.0	57.8	45	39.0		●
1280	12.80	14.0	107.0	58.1	45	38.9		●
1300	13.00	14.0	107.0	58.2	45	38.7		●
1350	13.50	14.0	107.0	58.7	45	38.4		●
1380	13.80	14.0	107.0	59.0	45	38.3		●
1400	14.00	14.0	107.0	59.3	45	38.3		●
1450	14.50	16.0	115.0	62.8	48	41.0		●
1480	14.80	16.0	115.0	63.0	48	40.8		●
1500	15.00	16.0	115.0	63.2	48	40.7		●
1550	15.50	16.0	115.0	63.7	48	40.4		●
1580	15.80	16.0	115.0	64.0	48	40.3		●
1600	16.00	16.0	115.0	64.2	48	40.2		●

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Application

Material



Steel
< 500 N/mm²



Steel
500 - 850 N/mm²



Steel
850 - 1100 N/mm²



Steel
1100 - 1300 N/mm²



Steel
1300 - 1500 N/mm²



Cold work tool steel
(12% Cr),
high alloyed
[1.2379]



Titanium alloys
> 300 HB
[Ti6Al4V]



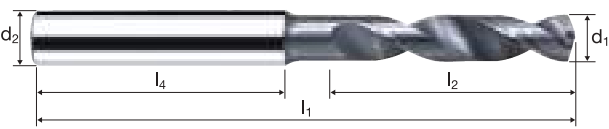
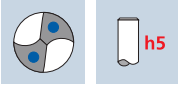
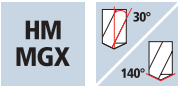
Cast iron
(lamellar / spheroidal)



d ₁ [mm]	v _c [m/min]	f [mm]	n [min ⁻¹]	v _f [mm/min]	Q [cm ³ /min]
3.00	180	0.1400	19100	2674	18.9
3.30	180	0.1550	17360	2691	23.0
3.50	180	0.1650	16370	2701	26.0
3.80	180	0.1750	15080	2639	29.9
4.00	180	0.1950	14325	2793	35.1
4.20	180	0.2100	13640	2864	39.7
4.50	180	0.2400	12730	3055	48.6
4.80	180	0.2550	11935	3043	55.1
5.00	180	0.2650	11460	3037	59.6
3.00	160	0.1200	16975	2037	14.4
3.30	160	0.1300	15435	2007	17.2
3.50	160	0.1400	14550	2037	19.6
3.80	160	0.1500	13405	2011	22.8
4.00	160	0.1650	12730	2101	26.4
4.20	160	0.1800	12125	2183	30.2
4.50	160	0.2050	11320	2321	36.9
4.80	160	0.2200	10610	2334	42.2
5.00	160	0.2300	10185	2343	46.0
3.00	140	0.1100	14855	1634	11.6
3.30	140	0.1200	13505	1621	13.9
3.50	140	0.1300	12730	1655	15.9
3.80	140	0.1400	11725	1642	18.6
4.00	140	0.1550	11140	1727	21.7
4.20	140	0.1650	10610	1751	24.3
4.50	140	0.1900	9905	1882	29.9
4.80	140	0.2000	9285	1857	33.6
5.00	140	0.2100	8915	1872	36.8
3.00	100	0.0850	10610	902	6.4
3.30	100	0.0900	9645	868	7.4
3.50	100	0.1000	9095	910	8.8
3.80	100	0.1050	8375	879	10.0
4.00	100	0.1150	7960	915	11.5
4.20	100	0.1250	7580	948	13.1
4.50	100	0.1450	7075	1026	16.3
4.80	100	0.1550	6630	1028	18.6
5.00	100	0.1600	6365	1018	20.0
3.00	55	0.0650	5835	379	2.7
3.30	55	0.0700	5305	371	3.2
3.50	55	0.0750	5000	375	3.6
3.80	55	0.0800	4605	368	4.2
4.00	55	0.0900	4375	394	4.9
4.20	55	0.0950	4170	396	5.5
4.50	55	0.1100	3890	428	6.8
4.80	55	0.1200	3645	437	7.9
5.00	55	0.1250	3500	438	8.6
3.00	70	0.0650	7425	483	3.4
3.30	70	0.0700	6750	473	4.0
3.50	70	0.0750	6365	477	4.6
3.80	70	0.0800	5865	469	5.3
4.00	70	0.0900	5570	501	6.3
4.20	70	0.0950	5305	504	7.0
4.50	70	0.1100	4950	545	8.7
4.80	70	0.1200	4640	557	10.1
5.00	70	0.1250	4455	557	10.9
3.00	40	0.0650	4245	276	2.0
3.30	40	0.0700	3860	270	2.3
3.50	40	0.0750	3640	273	2.6
3.80	40	0.0800	3350	268	3.0
4.00	40	0.0900	3185	287	3.6
4.20	40	0.0950	3030	288	4.0
4.50	40	0.1100	2830	311	5.0
4.80	40	0.1200	2655	319	5.8
5.00	40	0.1250	2545	318	6.2
3.00	240	0.1250	25465	3183	22.5
3.30	240	0.1400	23150	3241	27.7
3.50	240	0.1500	21825	3274	31.5
3.80	240	0.1600	20105	3217	36.5
4.00	240	0.1750	19100	3343	42.0
4.20	240	0.1900	18190	3456	47.9
4.50	240	0.2200	16975	3735	59.4
4.80	240	0.2350	15915	3740	67.7
5.00	240	0.2400	15280	3667	72.0

Spiral flute drills XDrill®

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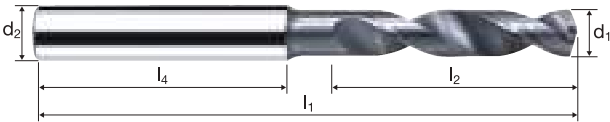
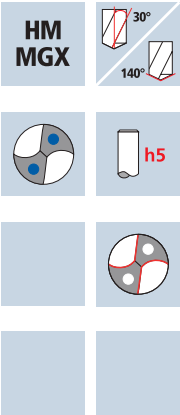
Rm <850 HRC <24	Rm 850-1100 HRC 24-34	Rm 1100-1300 HRC 34-42	Rm 1300-1500 HRC 42-48	HRC 48-56			Inox Stainless	Ti Titanium	GG(G)
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Example: Order-N°.							DURO-X	
Article-N°.							B72011	
ø-Code								
Ø Code	d1 m7	d2 h5	l1	l2	l4	Lmax		
0300	3.00	6.0	62.0	20.7	36	16.2		●
0310	3.10	6.0	62.0	20.8	36	16.2		●
0320	3.20	6.0	62.0	20.8	36	16.0		●
0330	3.30	6.0	62.0	20.9	36	16.0		●
0340	3.40	6.0	62.0	20.9	36	15.8		●
0350	3.50	6.0	62.0	21.0	36	15.8		●
0360	3.60	6.0	62.0	21.0	36	15.6		●
0370	3.70	6.0	62.0	21.1	36	15.6		●
0380	3.80	6.0	66.0	25.1	36	19.4		●
0390	3.90	6.0	66.0	25.2	36	19.4		●
0400	4.00	6.0	66.0	24.9	36	18.9		●
0410	4.10	6.0	66.0	25.0	36	18.9		●
0420	4.20	6.0	66.0	25.1	36	18.8		●
0430	4.30	6.0	66.0	25.1	36	18.7		●
0440	4.40	6.0	66.0	25.2	36	18.6		●
0450	4.50	6.0	66.0	25.3	36	18.6		●
0460	4.60	6.0	66.0	25.4	36	18.5		●
0470	4.70	6.0	66.0	25.5	36	18.5		●
0480	4.80	6.0	66.0	25.6	36	18.4		●
0490	4.90	6.0	66.0	25.7	36	18.4		●
0500	5.00	6.0	66.0	26.2	36	18.7		●
0510	5.10	6.0	66.0	26.3	36	18.7		●
0520	5.20	6.0	66.0	26.4	36	18.6		●

Application	Material	d_1 [mm]	v_c [m/min]	f [mm]	n [min ⁻¹]	v_f [mm/min]	Q [cm ³ /min]
	Steel < 500 N/mm ² 	5.50	180	0.2950	10415	3072	73.0
		5.80	180	0.3100	9880	3063	80.9
		6.00	180	0.3300	9550	3152	89.1
		6.20	180	0.3500	9240	3234	97.6
		6.50	180	0.3700	8815	3262	108.2
		6.80	180	0.3850	8425	3244	117.8
		7.00	180	0.3950	8185	3233	124.4
		7.20	180	0.4100	7960	3264	132.9
		7.50	180	0.4250	7640	3247	143.4
		7.50	180	0.4250	7640	3247	143.4
	Steel 500 - 850 N/mm ² 	5.50	160	0.2500	9260	2315	55.0
		5.80	160	0.2650	8780	2327	61.5
		6.00	160	0.2850	8490	2420	68.4
		6.20	160	0.3000	8215	2465	74.4
		6.50	160	0.3150	7835	2468	81.9
		6.80	160	0.3300	7490	2472	89.8
		7.00	160	0.3400	7275	2474	95.2
		7.20	160	0.3500	7075	2476	100.8
		7.50	160	0.3650	6790	2478	109.5
		7.50	160	0.3650	6790	2478	109.5
	Steel 850 - 1100 N/mm ² 	5.50	140	0.2300	8100	1863	44.3
		5.80	140	0.2450	7685	1883	49.7
		6.00	140	0.2600	7425	1931	54.6
		6.20	140	0.2750	7190	1977	59.7
		6.50	140	0.2900	6855	1988	66.0
		6.80	140	0.3050	6555	1999	72.6
		7.00	140	0.3150	6365	2005	77.2
		7.20	140	0.3200	6190	1981	80.6
		7.50	140	0.3350	5940	1990	87.9
		7.50	140	0.3350	5940	1990	87.9
	Steel 1100 - 1300 N/mm ² 	5.50	100	0.1750	5785	1012	24.1
		5.80	100	0.1850	5490	1016	26.8
		6.00	100	0.2000	5305	1061	30.0
		6.20	100	0.2100	5135	1078	32.6
		6.50	100	0.2200	4895	1077	35.7
		6.80	100	0.2300	4680	1076	39.1
		7.00	100	0.2400	4545	1091	42.0
		7.20	100	0.2450	4420	1083	44.1
		7.50	100	0.2550	4245	1083	47.8
		7.50	100	0.2550	4245	1083	47.8
	Steel 1300 - 1500 N/mm ² 	5.50	55	0.1350	3185	430	10.2
		5.80	55	0.1450	3020	438	11.6
		6.00	55	0.1500	2920	438	12.4
		6.20	55	0.1600	2825	452	13.6
		6.50	55	0.1700	2695	458	15.2
		6.80	55	0.1800	2575	464	16.8
		7.00	55	0.1850	2500	463	17.8
		7.20	55	0.1900	2430	462	18.8
		7.50	55	0.1950	2335	455	20.1
		7.50	55	0.1950	2335	455	20.1
	Cold work tool steel (12% Cr), high alloyed [1.2379] 	5.50	70	0.1350	4050	547	13.0
		5.80	70	0.1450	3840	557	14.7
		6.00	70	0.1500	3715	557	15.8
		6.20	70	0.1600	3595	575	17.4
		6.50	70	0.1700	3430	583	19.3
		6.80	70	0.1800	3275	590	21.4
		7.00	70	0.1850	3185	589	22.7
		7.20	70	0.1900	3095	588	23.9
		7.50	70	0.1950	2970	579	25.6
		7.50	70	0.1950	2970	579	25.6
	Titanium alloys > 300 HB [Ti6Al4V] 	5.50	40	0.1350	2315	313	7.4
		5.80	40	0.1450	2195	318	8.4
		6.00	40	0.1500	2120	318	9.0
		6.20	40	0.1600	2055	329	9.9
		6.50	40	0.1700	1960	333	11.1
		6.80	40	0.1800	1870	337	12.2
		7.00	40	0.1850	1820	337	13.0
		7.20	40	0.1900	1770	336	13.7
		7.50	40	0.1950	1700	332	14.6
		7.50	40	0.1950	1700	332	14.6
	Cast iron (lamellar / spheroidal) 	5.50	240	0.2650	13890	3681	87.5
		5.80	240	0.2800	13170	3688	97.4
		6.00	240	0.3000	12730	3819	108.0
		6.20	240	0.3200	12320	3942	119.0
		6.50	240	0.3350	11755	3938	130.7
		6.80	240	0.3500	11235	3932	142.8
		7.00	240	0.3600	10915	3929	151.2
		7.20	240	0.3700	10610	3926	159.8
		7.50	240	0.3850	10185	3921	173.2
		7.50	240	0.3850	10185	3921	173.2

Spiral flute drills XDrill®

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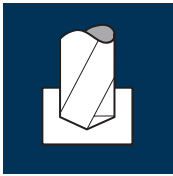


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Rm <850 HRC <24	Rm 850-1100 HRC 24-34	Rm 1100-1300 HRC 34-42	Rm 1300-1500 HRC 42-48	HRC 48-56			Inox Stainless	Ti Titanium	GG(G)
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Example: Order-N°.							Article-N°.		ø-Code				DURO-X	
							B72011		0530				B72011	
Ø Code	d1 m7	d2 h5		l1	l2	l4	Lmax							
0530	5.30	6.0		66.0	26.5	36	18.6						●	
0540	5.40	6.0		66.0	26.6	36	18.5						●	
0550	5.50	6.0		66.0	26.7	36	18.5						●	
0560	5.60	6.0		66.0	26.8	36	18.4						●	
0570	5.70	6.0		66.0	26.9	36	18.4						●	
0580	5.80	6.0		66.0	27.1	36	18.4						●	
0590	5.90	6.0		66.0	27.2	36	18.4						●	
0600	6.00	6.0		66.0	27.5	36	18.5						●	
0610	6.10	8.0		79.0	38.4	36	29.3						●	
0620	6.20	8.0		79.0	38.5	36	29.2						●	
0630	6.30	8.0		79.0	38.6	36	29.2						●	
0640	6.40	8.0		79.0	38.7	36	29.1						●	
0650	6.50	8.0		79.0	38.8	36	29.1						●	
0660	6.60	8.0		79.0	38.9	36	29.0						●	
0670	6.70	8.0		79.0	39.0	36	29.0						●	
0680	6.80	8.0		79.0	39.0	36	28.8						●	
0690	6.90	8.0		79.0	39.1	36	28.8						●	
0700	7.00	8.0		79.0	39.2	36	28.7						●	
0710	7.10	8.0		79.0	39.3	36	28.7						●	
0720	7.20	8.0		79.0	39.4	36	28.6						●	
0730	7.30	8.0		79.0	39.5	36	28.6						●	
0740	7.40	8.0		79.0	39.6	36	28.5						●	
0750	7.50	8.0		79.0	39.7	36	28.5						●	

Application



Material

Steel
< 500 N/mm²



Steel
500 - 850 N/mm²



Steel
850 - 1100 N/mm²



Steel
1100 - 1300 N/mm²



Steel
1300 - 1500 N/mm²



Cold work tool steel
(12% Cr),
high alloyed
[1.2379]



Titanium alloys
> 300 HB
[Ti6Al4V]



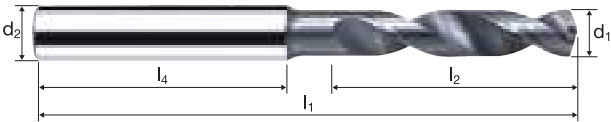
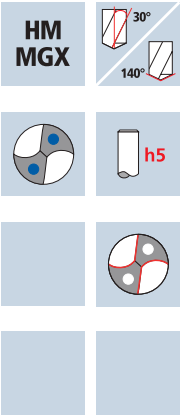
Cast iron
(lamellar / spheroidal)



d ₁ [mm]	v _c [m/min]	f [mm]	n [min ⁻¹]	v _f [mm/min]	Q [cm ³ /min]
7.60	180	0.4300	7540	3242	147.1
8.00	180	0.4550	7160	3258	163.8
8.20	180	0.4650	6985	3248	171.5
8.50	180	0.4800	6740	3235	183.6
8.80	180	0.5000	6510	3255	198.0
9.00	180	0.5100	6365	3246	206.5
9.20	180	0.5200	6230	3240	215.4
9.50	180	0.5400	6030	3256	230.8
9.80	180	0.5550	5845	3244	244.7
7.60	160	0.3700	6700	2479	112.5
8.00	160	0.3900	6365	2482	124.8
8.20	160	0.4000	6210	2484	131.2
8.50	160	0.4150	5990	2486	141.1
8.80	160	0.4250	5785	2459	149.5
9.00	160	0.4350	5660	2462	156.6
9.20	160	0.4450	5535	2463	163.7
9.50	160	0.4600	5360	2466	174.8
9.80	160	0.4750	5195	2468	186.1
7.60	140	0.3400	5865	1994	90.5
8.00	140	0.3600	5570	2005	100.8
8.20	140	0.3650	5435	1984	104.8
8.50	140	0.3800	5245	1993	113.1
8.80	140	0.3950	5065	2001	121.7
9.00	140	0.4050	4950	2005	127.5
9.20	140	0.4100	4845	1987	132.1
9.50	140	0.4250	4690	1993	141.3
9.80	140	0.4400	4545	2000	150.8
7.60	100	0.2600	4190	1089	49.4
8.00	100	0.2700	3980	1075	54.0
8.20	100	0.2800	3880	1086	57.4
8.50	100	0.2900	3745	1086	61.6
8.80	100	0.3000	3615	1085	66.0
9.00	100	0.3050	3535	1078	68.6
9.20	100	0.3150	3460	1090	72.5
9.50	100	0.3250	3350	1089	77.2
9.80	100	0.3350	3250	1089	82.1
7.60	55	0.2000	2305	461	20.9
8.00	55	0.2100	2190	460	23.1
8.20	55	0.2150	2135	459	24.2
8.50	55	0.2200	2060	453	25.7
8.80	55	0.2300	1990	458	27.8
9.00	55	0.2350	1945	457	29.1
9.20	55	0.2400	1905	457	30.4
9.50	55	0.2500	1845	461	32.7
9.80	55	0.2550	1785	455	34.3
7.60	70	0.2000	2930	586	26.6
8.00	70	0.2100	2785	585	29.4
8.20	70	0.2150	2715	584	30.8
8.50	70	0.2200	2620	576	32.7
8.80	70	0.2300	2530	582	35.4
9.00	70	0.2350	2475	582	37.0
9.20	70	0.2400	2420	581	38.6
9.50	70	0.2500	2345	586	41.6
9.80	70	0.2550	2275	580	43.8
7.60	40	0.2000	1675	335	15.2
8.00	40	0.2100	1590	334	16.8
8.20	40	0.2150	1555	334	17.7
8.50	40	0.2200	1500	330	18.7
8.80	40	0.2300	1445	332	20.2
9.00	40	0.2350	1415	333	21.2
9.20	40	0.2400	1385	332	22.1
9.50	40	0.2500	1340	335	23.7
9.80	40	0.2550	1300	332	25.0
7.60	240	0.3900	10050	3920	177.8
8.00	240	0.4100	9550	3916	196.8
8.20	240	0.4200	9315	3912	206.6
8.50	240	0.4400	8990	3956	224.5
8.80	240	0.4550	8680	3949	240.2
9.00	240	0.4650	8490	3948	251.2
9.20	240	0.4750	8305	3945	262.2
9.50	240	0.4900	8040	3940	279.2
9.80	240	0.5050	7795	3937	296.9

Spiral flute drills XDrill®

3xd



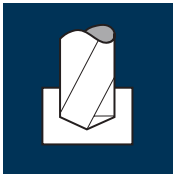
ReTool®

Rm <850 HRC <24	Rm 850-1100 HRC 24-34	Rm 1100-1300 HRC 34-42	Rm 1300-1500 HRC 42-48	HRC 48-56			Inox Stainless	Ti Titanium	GG(G)
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Example: Order-Nº. Article-Nº. B72011 ø-Code 0760								DURO-X
								B72011
Ø Code	d ₁ m7	d ₂ h5	l ₁	l ₂	l ₄	L _{max}		
0760	7.60	8.0	79.0	39.8	36	28.4		●
0770	7.70	8.0	79.0	39.9	36	28.4		●
0780	7.80	8.0	79.0	40.0	36	28.3		●
0790	7.90	8.0	79.0	40.2	36	28.4		●
0800	8.00	8.0	79.0	40.4	36	28.4		●
0810	8.10	10.0	89.0	44.4	40	32.3		●
0820	8.20	10.0	89.0	44.5	40	32.2		●
0830	8.30	10.0	89.0	44.6	40	32.2		●
0840	8.40	10.0	89.0	44.7	40	32.1		●
0850	8.50	10.0	89.0	44.8	40	32.1		●
0860	8.60	10.0	89.0	44.8	40	31.9		●
0870	8.70	10.0	89.0	44.9	40	31.9		●
0880	8.80	10.0	89.0	45.0	40	31.8		●
0890	8.90	10.0	89.0	45.1	40	31.8		●
0900	9.00	10.0	89.0	45.2	40	31.7		●
0910	9.10	10.0	89.0	45.3	40	31.7		●
0920	9.20	10.0	89.0	45.4	40	31.6		●
0930	9.30	10.0	89.0	45.5	40	31.6		●
0940	9.40	10.0	89.0	45.5	40	31.4		●
0950	9.50	10.0	89.0	45.6	40	31.4		●
0960	9.60	10.0	89.0	45.7	40	31.3		●
0970	9.70	10.0	89.0	45.8	40	31.3		●
0980	9.80	10.0	89.0	46.0	40	31.3		●

Application

Material



Steel
< 500 N/mm²



Steel
500 - 850 N/mm²



Steel
850 - 1100 N/mm²



Steel
1100 - 1300 N/mm²



Steel
1300 - 1500 N/mm²



Cold work tool steel
(12% Cr),
high alloyed
[1.2379]



Titanium alloys
> 300 HB
[Ti6Al4V]



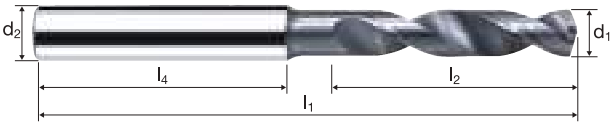
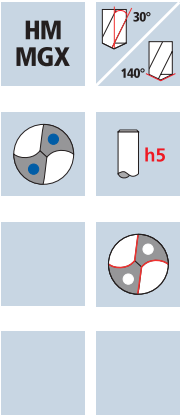
Cast iron
(lamellar / spheroidal)



d ₁ [mm]	v _c [m/min]	f [mm]	n [min ⁻¹]	v _f [mm/min]	Q [cm ³ /min]
10.00	180	0.5650	5730	3238	254.3
10.20	180	0.5750	5615	3229	263.8
10.50	180	0.5900	5455	3219	278.7
10.80	180	0.6050	5305	3210	294.0
11.00	180	0.6100	5210	3178	302.0
11.20	180	0.6150	5115	3146	309.9
11.50	180	0.6200	4980	3088	320.7
11.80	180	0.6300	4855	3059	334.5
12.00	180	0.6400	4775	3056	345.6
10.00	160	0.4850	5095	2471	194.1
10.20	160	0.4950	4995	2473	202.0
10.50	160	0.5050	4850	2449	212.1
10.80	160	0.5200	4715	2452	224.6
11.00	160	0.5250	4630	2431	231.0
11.20	160	0.5300	4545	2409	237.3
11.50	160	0.5300	4430	2348	243.9
11.80	160	0.5400	4315	2330	254.8
12.00	160	0.5500	4245	2335	264.1
10.00	140	0.4450	4455	1983	155.7
10.20	140	0.4550	4370	1988	162.5
10.50	140	0.4650	4245	1974	170.9
10.80	140	0.4750	4125	1959	179.5
11.00	140	0.4850	4050	1964	186.7
11.20	140	0.4850	3980	1930	190.2
11.50	140	0.4900	3875	1899	197.2
11.80	140	0.4950	3775	1869	204.3
12.00	140	0.5050	3715	1876	212.2
10.00	100	0.3400	3185	1083	85.1
10.20	100	0.3450	3120	1076	88.0
10.50	100	0.3550	3030	1076	93.1
10.80	100	0.3650	2945	1075	98.5
11.00	100	0.3650	2895	1057	100.4
11.20	100	0.3700	2840	1051	103.5
11.50	100	0.3750	2770	1039	107.9
11.80	100	0.3800	2700	1026	112.2
12.00	100	0.3850	2655	1022	115.6
10.00	55	0.2600	1750	455	35.7
10.20	55	0.2650	1715	455	37.1
10.50	55	0.2750	1665	458	39.6
10.80	55	0.2800	1620	454	41.6
11.00	55	0.2850	1590	453	43.1
11.20	55	0.2850	1565	446	43.9
11.50	55	0.2850	1520	433	45.0
11.80	55	0.2900	1485	431	47.1
12.00	55	0.2950	1460	431	48.7
10.00	70	0.2600	2230	580	45.5
10.20	70	0.2650	2185	579	47.3
10.50	70	0.2750	2120	583	50.5
10.80	70	0.2800	2065	578	53.0
11.00	70	0.2850	2025	577	54.8
11.20	70	0.2850	1990	567	55.9
11.50	70	0.2850	1940	553	57.4
11.80	70	0.2900	1890	548	59.9
12.00	70	0.2950	1855	547	61.9
10.00	40	0.2600	1275	332	26.0
10.20	40	0.2650	1250	331	27.1
10.50	40	0.2750	1215	334	28.9
10.80	40	0.2800	1180	330	30.3
11.00	40	0.2850	1155	329	31.3
11.20	40	0.2850	1135	324	31.9
11.50	40	0.2850	1105	315	32.7
11.80	40	0.2900	1080	313	34.3
12.00	40	0.2950	1060	313	35.4
10.00	240	0.5150	7640	3935	309.0
10.20	240	0.5200	7490	3895	318.3
10.50	240	0.5400	7275	3929	340.2
10.80	240	0.5500	7075	3891	356.5
11.00	240	0.5550	6945	3855	366.3
11.20	240	0.5600	6820	3819	376.3
11.50	240	0.5650	6645	3754	390.0
11.80	240	0.5700	6475	3691	403.6
12.00	240	0.5800	6365	3692	417.5

Spiral flute drills XDrill®

3xd



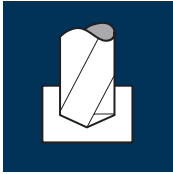
ReTool®

Rm <850 HRC <24	Rm 850-1100 HRC 24-34	Rm 1100-1300 HRC 34-42	Rm 1300-1500 HRC 42-48	HRC 48-56			Inox Stainless	Ti Titanium	GG(G)
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Example: Order-Nº. B72011 0990							DURO-X	
							B72011	
Ø Code	d ₁ m7	d ₂ h5	l ₁	l ₂	l ₄	L _{max}		
0990	9.90	10.0	89.0	46.1	40	31.3		●
1000	10.00	10.0	89.0	46.3	40	31.3		●
1010	10.10	12.0	102.0	52.4	45	37.3		●
1020	10.20	12.0	102.0	52.5	45	37.2		●
1030	10.30	12.0	102.0	52.6	45	37.2		●
1040	10.40	12.0	102.0	52.7	45	37.1		●
1050	10.50	12.0	102.0	52.7	45	37.0		●
1060	10.60	12.0	102.0	52.8	45	36.9		●
1070	10.70	12.0	102.0	52.9	45	36.9		●
1080	10.80	12.0	102.0	53.0	45	36.8		●
1090	10.90	12.0	102.0	53.1	45	36.8		●
1100	11.00	12.0	102.0	53.2	45	36.7		●
1110	11.10	12.0	102.0	53.3	45	36.7		●
1120	11.20	12.0	102.0	53.3	45	36.5		●
1130	11.30	12.0	102.0	53.4	45	36.5		●
1140	11.40	12.0	102.0	53.5	45	36.4		●
1150	11.50	12.0	102.0	53.6	45	36.4		●
1160	11.60	12.0	102.0	53.7	45	36.3		●
1170	11.70	12.0	102.0	53.8	45	36.3		●
1180	11.80	12.0	102.0	53.9	45	36.2		●
1190	11.90	12.0	102.0	54.1	45	36.3		●
1200	12.00	12.0	102.0	54.3	45	36.3		●

Application

Material



Steel
< 500 N/mm²



Steel
500 - 850 N/mm²



Steel
850 - 1100 N/mm²



Steel
1100 - 1300 N/mm²



Steel
1300 - 1500 N/mm²



Cold work tool steel
(12% Cr),
high alloyed
[1.2379]



Titanium alloys
> 300 HB
[Ti6Al4V]

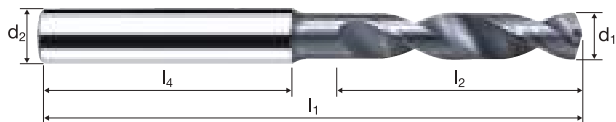


Cast iron
(lamellar / spheroidal)



d ₁ [mm]	v _c [m/min]	f [mm]	n [min ⁻¹]	v _f [mm/min]	Q [cm ³ /min]
12.50	180	0.6650	4585	3049	374.2
13.00	180	0.6950	4405	3062	406.4
13.50	180	0.7050	4245	2993	428.4
14.00	180	0.7150	4095	2928	450.7
14.50	180	0.7250	3950	2864	472.9
15.00	180	0.7450	3820	2846	502.9
15.50	180	0.7600	3695	2808	529.9
15.80	180	0.7700	3625	2791	547.3
16.00	180	0.7750	3580	2775	557.8
12.50	160	0.5700	4075	2323	285.1
13.00	160	0.5950	3920	2332	309.6
13.50	160	0.6050	3775	2284	326.9
14.00	160	0.6100	3640	2220	341.8
14.50	160	0.6200	3510	2176	359.4
15.00	160	0.6400	3395	2173	384.0
15.50	160	0.6500	3285	2135	402.9
15.80	160	0.6600	3225	2129	417.3
16.00	160	0.6650	3185	2118	425.8
12.50	140	0.5250	3565	1872	229.7
13.00	140	0.5450	3430	1869	248.1
13.50	140	0.5550	3300	1832	262.2
14.00	140	0.5650	3185	1800	277.0
14.50	140	0.5700	3075	1753	289.4
15.00	140	0.5900	2970	1752	309.7
15.50	140	0.6000	2875	1725	325.5
15.80	140	0.6050	2820	1706	334.5
16.00	140	0.6100	2785	1699	341.6
12.50	100	0.4000	2545	1018	124.9
13.00	100	0.4150	2450	1017	135.0
13.50	100	0.4200	2360	991	141.9
14.00	100	0.4300	2275	978	150.6
14.50	100	0.4350	2195	955	157.7
15.00	100	0.4450	2120	943	166.7
15.50	100	0.4550	2055	935	176.4
15.80	100	0.4600	2015	927	181.7
16.00	100	0.4650	1990	925	186.1
12.50	55	0.3100	1400	434	53.3
13.00	55	0.3200	1345	430	57.1
13.50	55	0.3250	1295	421	60.2
14.00	55	0.3300	1250	413	63.5
14.50	55	0.3350	1205	404	66.7
15.00	55	0.3450	1165	402	71.0
15.50	55	0.3500	1130	396	74.6
15.80	55	0.3550	1110	394	77.3
16.00	55	0.3550	1095	389	78.2
12.50	70	0.3100	1785	553	67.9
13.00	70	0.3200	1715	549	72.8
13.50	70	0.3250	1650	536	76.8
14.00	70	0.3300	1590	525	80.8
14.50	70	0.3350	1535	514	84.9
15.00	70	0.3450	1485	512	90.5
15.50	70	0.3500	1440	504	95.1
15.80	70	0.3550	1410	501	98.2
16.00	70	0.3550	1395	495	99.6
12.50	40	0.3100	1020	316	38.8
13.00	40	0.3200	980	314	41.6
13.50	40	0.3250	945	307	44.0
14.00	40	0.3300	910	300	46.2
14.50	40	0.3350	880	295	48.7
15.00	40	0.3450	850	293	51.8
15.50	40	0.3500	820	287	54.2
15.80	40	0.3550	805	286	56.0
16.00	40	0.3550	795	282	56.7
12.50	240	0.6050	6110	3697	453.6
13.00	240	0.6300	5875	3701	491.3
13.50	240	0.6400	5660	3622	518.5
14.00	240	0.6500	5455	3546	545.8
14.50	240	0.6600	5270	3478	574.4
15.00	240	0.6750	5095	3439	607.7
15.50	240	0.6900	4930	3402	641.9
15.80	240	0.7000	4835	3385	663.6
16.00	240	0.7050	4775	3366	676.9

3xd



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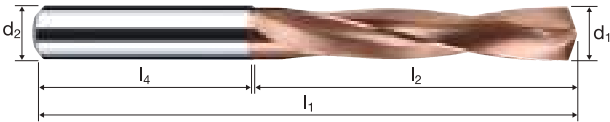
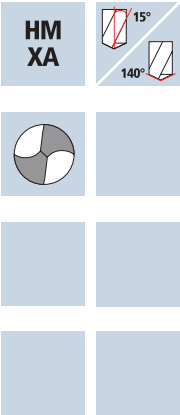
Rm ≤ 850 HRC ≤ 24	Rm 850-1100 HRC 24-34	Rm 1100-1300 HRC 34-42	Rm 1300-1500 HRC 42-48	HRC 48-56			Inox Stainless	Ti Titanium	GG(G)
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[illegible]

Application	Material	d_1 [mm]	v_c [m/min]	f [mm]	n [min ⁻¹]	v_f [mm/min]	Q [cm ³ /min]
	Hardened tool steel 42 - 48 HRC 	2.55	35	0.0490	4370	214	1.1
		2.80	35	0.0520	3980	207	1.3
		3.00	35	0.0540	3715	201	1.4
		3.30	35	0.0580	3375	196	1.7
		3.60	35	0.0610	3095	189	1.9
	Hardened tool steel 48 - 52 HRC 	4.00	35	0.0650	2785	181	2.3
		4.30	35	0.0690	2590	179	2.6
		4.50	35	0.0710	2475	176	2.8
		4.65	35	0.0720	2395	172	2.9
		2.55	30	0.0490	3745	184	0.9
	Hardened tool steel 52 - 56 HRC 	2.80	30	0.0520	3410	177	1.1
		3.00	30	0.0540	3185	172	1.2
		3.30	30	0.0580	2895	168	1.4
		3.60	30	0.0610	2655	162	1.6
		4.00	30	0.0650	2385	155	1.9
	Hardened tool steel 56 - 60 HRC  	4.30	30	0.0690	2220	153	2.2
		4.50	30	0.0710	2120	151	2.4
		4.65	30	0.0720	2055	148	2.5
		2.55	25	0.0320	3120	100	0.5
		2.80	25	0.0340	2840	97	0.6
	Hardened tool steel > 60 HRC  	3.00	25	0.0350	2655	93	0.7
		3.30	25	0.0370	2410	89	0.8
		3.60	25	0.0400	2210	88	0.9
		4.00	25	0.0430	1990	86	1.1
		4.30	25	0.0450	1850	83	1.2
		4.50	25	0.0460	1770	81	1.3
		4.65	25	0.0470	1710	80	1.4
		2.55	20	0.0270	2495	67	0.3
		2.80	20	0.0290	2275	66	0.4
		3.00	20	0.0300	2120	64	0.4
		3.30	20	0.0320	1930	62	0.5
		3.60	20	0.0340	1770	60	0.6
		4.00	20	0.0360	1590	57	0.7
		4.30	20	0.0380	1480	56	0.8
		4.50	20	0.0390	1415	55	0.9
		4.65	20	0.0400	1370	55	0.9

Spiral flute drills Supradrill® H

3xd



ReTool®

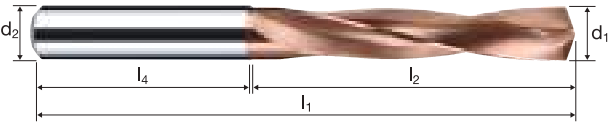
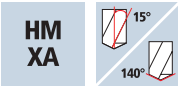
				HRC 48-56	HRC 56-60	HRC > 60			
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Example: Order-Nº.							DURO-VD	
Article-Nº. ø-Code							B52112	
Example: B52112 0255								
Ø Code	d ₁ h7	d ₂ h6	l ₁	l ₂	l ₄	L _{max}		
0255	2.55	6.0	62.0	20.0	36	14.0		●
0260	2.60	6.0	62.0	20.0	36	14.0		●
0270	2.70	6.0	62.0	20.0	36	14.0		●
0280	2.80	6.0	62.0	20.0	36	14.0		●
0290	2.90	6.0	62.0	20.0	36	14.0		●
0300	3.00	6.0	62.0	20.0	36	14.0		●
0310	3.10	6.0	62.0	20.0	36	14.0		●
0320	3.20	6.0	62.0	20.0	36	14.0		●
0330	3.30	6.0	62.0	20.0	36	14.0		●
0340	3.40	6.0	62.0	20.0	36	14.0		●
0350	3.50	6.0	62.0	20.0	36	14.0		●
0360	3.60	6.0	62.0	20.0	36	14.0		●
0370	3.70	6.0	62.0	20.0	36	14.0		●
0380	3.80	6.0	66.0	24.0	36	17.0		●
0390	3.90	6.0	66.0	24.0	36	17.0		●
0400	4.00	6.0	66.0	24.0	36	17.0		●
0410	4.10	6.0	66.0	24.0	36	17.0		●
0420	4.20	6.0	66.0	24.0	36	17.0		●
0430	4.30	6.0	66.0	24.0	36	17.0		●
0440	4.40	6.0	66.0	24.0	36	17.0		●
0450	4.50	6.0	66.0	24.0	36	17.0		●
0460	4.60	6.0	66.0	24.0	36	17.0		●
0465	4.65	6.0	66.0	24.0	36	17.0		●

Application	Material	d_1 [mm]	v_c [m/min]	f [mm]	n [min ⁻¹]	v_f [mm/min]	Q [cm ³ /min]
	Hardened tool steel 42 - 48 HRC 	4.80	35	0.0740	2320	172	3.1
		5.00	35	0.0760	2230	170	3.3
		5.20	35	0.0780	2140	167	3.5
		5.50	35	0.0810	2025	164	3.9
		5.70	35	0.0840	1955	164	4.2
	Hardened tool steel 48 - 52 HRC 	6.00	35	0.0870	1855	161	4.6
		6.30	35	0.0900	1770	159	5.0
		6.50	35	0.0920	1715	158	5.2
		6.80	35	0.0950	1640	156	5.7
		4.80	30	0.0740	1990	147	2.7
	Hardened tool steel 52 - 56 HRC 	5.00	30	0.0760	1910	145	2.9
		5.20	30	0.0780	1835	143	3.0
		5.50	30	0.0810	1735	141	3.3
		5.70	30	0.0840	1675	141	3.6
		6.00	30	0.0870	1590	138	3.9
	Hardened tool steel 56 - 60 HRC  	6.30	30	0.0900	1515	136	4.3
		6.50	30	0.0920	1470	135	4.5
		6.80	30	0.0950	1405	134	4.8
		4.80	25	0.0480	1660	80	1.4
		5.00	25	0.0500	1590	80	1.6
	Hardened tool steel > 60 HRC  	5.20	25	0.0510	1530	78	1.7
		5.50	25	0.0530	1445	77	1.8
		5.70	25	0.0540	1395	75	1.9
		6.00	25	0.0560	1325	74	2.1
		6.30	25	0.0580	1265	73	2.3
		6.50	25	0.0600	1225	74	2.4
		6.80	25	0.0620	1170	73	2.6
		4.80	20	0.0410	1325	54	1.0
		5.00	20	0.0420	1275	54	1.1
		5.20	20	0.0430	1225	53	1.1
		5.50	20	0.0450	1155	52	1.2
		5.70	20	0.0460	1115	51	1.3
		6.00	20	0.0480	1060	51	1.4
		6.30	20	0.0490	1010	50	1.5
		6.50	20	0.0500	980	49	1.6
		6.80	20	0.0520	935	49	1.8

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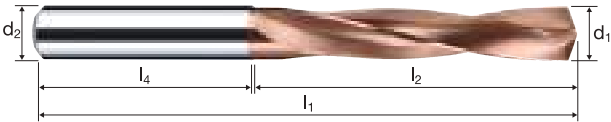
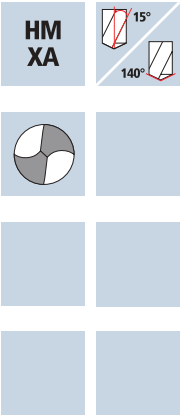
				HRC 48-56	HRC 56-60	HRC > 60			
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Example: Order-Nº.							DURO-VD	
Article-Nº. ø-Code							B52112	
B52112 0470								
Ø Code	d ₁ h7	d ₂ h5	l ₁	l ₂	l ₄	L _{max}		
0470	4.70	6.0	66.0	24.0	36	17.0		●
0480	4.80	6.0	66.0	28.0	36	20.0		●
0490	4.90	6.0	66.0	28.0	36	20.0		●
0500	5.00	6.0	66.0	28.0	36	20.0		●
0510	5.10	6.0	66.0	28.0	36	20.0		●
0520	5.20	6.0	66.0	28.0	36	20.0		●
0530	5.30	6.0	66.0	28.0	36	20.0		●
0540	5.40	6.0	66.0	28.0	36	20.0		●
0550	5.50	6.0	66.0	28.0	36	20.0		●
0555	5.55	6.0	66.0	28.0	36	20.0		●
0560	5.60	6.0	66.0	28.0	36	20.0		●
0570	5.70	6.0	66.0	28.0	36	20.0		●
0580	5.80	6.0	66.0	28.0	36	20.0		●
0590	5.90	6.0	66.0	28.0	36	20.0		●
0600	6.00	6.0	66.0	28.0	36	20.0		●
0610	6.10	8.0	79.0	34.0	36	24.0		●
0620	6.20	8.0	79.0	34.0	36	24.0		●
0630	6.30	8.0	79.0	34.0	36	24.0		●
0640	6.40	8.0	79.0	34.0	36	24.0		●
0650	6.50	8.0	79.0	34.0	36	24.0		●
0660	6.60	8.0	79.0	34.0	36	24.0		●
0670	6.70	8.0	79.0	34.0	36	24.0		●
0680	6.80	8.0	79.0	34.0	36	24.0		●

Application	Material	d_1 [mm]	v_c [m/min]	f [mm]	n [min ⁻¹]	v_f [mm/min]	Q [cm ³ /min]
	Hardened tool steel 42 - 48 HRC 	6.90	35	0.0960	1615	155	5.8
		7.10	35	0.0980	1570	154	6.1
		7.40	35	0.1000	1505	151	6.5
		7.70	35	0.1030	1445	149	6.9
		8.00	35	0.1060	1395	148	7.4
		8.30	35	0.1090	1340	146	7.9
		8.60	35	0.1120	1295	145	8.4
		8.90	35	0.1140	1250	143	8.9
		9.10	35	0.1160	1225	142	9.2
		6.90	30	0.0960	1385	133	5.0
		7.10	30	0.0980	1345	132	5.2
		7.40	30	0.1000	1290	129	5.5
		7.70	30	0.1030	1240	128	5.9
		8.00	30	0.1060	1195	127	6.4
		8.30	30	0.1090	1150	125	6.8
		8.60	30	0.1120	1110	124	7.2
		8.90	30	0.1140	1075	123	7.6
		9.10	30	0.1160	1050	122	7.9
		6.90	30	0.0960	1385	133	5.0
		7.10	30	0.0980	1345	132	5.2
		7.40	30	0.1000	1290	129	5.5
		7.70	30	0.1030	1240	128	5.9
		8.00	30	0.1060	1195	127	6.4
		8.30	30	0.1090	1150	125	6.8
		8.60	30	0.1120	1110	124	7.2
		8.90	30	0.1140	1075	123	7.6
		9.10	30	0.1160	1050	122	7.9
		6.90	25	0.0620	1155	72	2.7
		7.10	25	0.0630	1120	71	2.8
		7.40	25	0.0650	1075	70	3.0
		7.70	25	0.0670	1035	69	3.2
		8.00	25	0.0690	995	69	3.5
		8.30	25	0.0710	960	68	3.7
		8.60	25	0.0730	925	68	3.9
		8.90	25	0.0740	895	66	4.1
		9.10	25	0.0760	875	67	4.3
		6.90	20	0.0530	925	49	1.8
		7.10	20	0.0540	895	48	1.9
		7.40	20	0.0550	860	47	2.0
		7.70	20	0.0570	825	47	2.2
		8.00	20	0.0580	795	46	2.3
		8.30	20	0.0600	765	46	2.5
		8.60	20	0.0610	740	45	2.6
		8.90	20	0.0630	715	45	2.8
		9.10	20	0.0640	700	45	2.9

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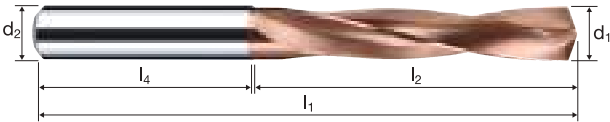
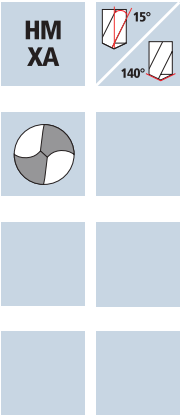
				HRC 48-56	HRC 56-60	HRC > 60			
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Example: Order-Nº.							DURO-VD	
Article-Nº. 0690							B52112	
Ø Code	d1 h7	d2 h5	l1	l2	l4	Lmax		
0690	6.90	8.0	79.0	34.0	36	24.0		●
0700	7.00	8.0	79.0	34.0	36	24.0		●
0710	7.10	8.0	79.0	41.0	36	29.0		●
0720	7.20	8.0	79.0	41.0	36	29.0		●
0730	7.30	8.0	79.0	41.0	36	29.0		●
0740	7.40	8.0	79.0	41.0	36	29.0		●
0750	7.50	8.0	79.0	41.0	36	29.0		●
0760	7.60	8.0	79.0	41.0	36	29.0		●
0770	7.70	8.0	79.0	41.0	36	29.0		●
0780	7.80	8.0	79.0	41.0	36	29.0		●
0790	7.90	8.0	79.0	41.0	36	29.0		●
0800	8.00	8.0	79.0	41.0	36	29.0		●
0810	8.10	10.0	89.0	47.0	40	35.0		●
0820	8.20	10.0	89.0	47.0	40	35.0		●
0830	8.30	10.0	89.0	47.0	40	35.0		●
0840	8.40	10.0	89.0	47.0	40	35.0		●
0850	8.50	10.0	89.0	47.0	40	35.0		●
0860	8.60	10.0	89.0	47.0	40	35.0		●
0870	8.70	10.0	89.0	47.0	40	35.0		●
0880	8.80	10.0	89.0	47.0	40	35.0		●
0890	8.90	10.0	89.0	47.0	40	35.0		●
0900	9.00	10.0	89.0	47.0	40	35.0		●
0910	9.10	10.0	89.0	47.0	40	35.0		●

Application	Material	d_1 [mm]	v_c [m/min]	f [mm]	n [min ⁻¹]	v_f [mm/min]	Q [cm ³ /min]
	Hardened tool steel 42 - 48 HRC 	9.20	35	0.1170	1210	142	9.4
		9.50	35	0.1200	1175	141	10.0
		9.70	35	0.1220	1150	140	10.4
		10.00	35	0.1240	1115	138	10.9
		10.20	35	0.1260	1090	137	11.2
	Hardened tool steel 48 - 52 HRC 	10.40	35	0.1280	1070	137	11.6
		10.70	35	0.1300	1040	135	12.2
		11.00	35	0.1330	1015	135	12.8
		11.30	35	0.1350	985	133	13.3
		9.20	30	0.1170	1040	122	8.1
	Hardened tool steel 52 - 56 HRC 	9.50	30	0.1200	1005	121	8.5
		9.70	30	0.1220	985	120	8.9
		10.00	30	0.1240	955	118	9.3
		10.20	30	0.1260	935	118	9.6
		10.40	30	0.1280	920	118	10.0
	Hardened tool steel 56 - 60 HRC  	10.70	30	0.1300	890	116	10.4
		11.00	30	0.1330	870	116	11.0
		11.30	30	0.1350	845	114	11.4
		9.20	25	0.0760	865	66	4.4
		9.50	25	0.0780	840	66	4.6
	Hardened tool steel > 60 HRC  	9.70	25	0.0790	820	65	4.8
		10.00	25	0.0810	795	64	5.1
		10.20	25	0.0820	780	64	5.2
		10.40	25	0.0830	765	64	5.4
		10.70	25	0.0850	745	63	5.7
		11.00	25	0.0860	725	62	5.9
		11.30	25	0.0880	705	62	6.2
		9.20	15	0.0640	520	33	2.2
		9.50	15	0.0660	505	33	2.4
		9.70	15	0.0670	490	33	2.4
		10.00	15	0.0680	475	32	2.5
		10.20	15	0.0690	470	32	2.6
		10.40	15	0.0700	460	32	2.7
		10.70	15	0.0720	445	32	2.9
		11.00	15	0.0730	435	32	3.0
		11.30	15	0.0740	425	32	3.2

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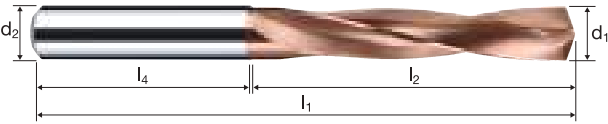
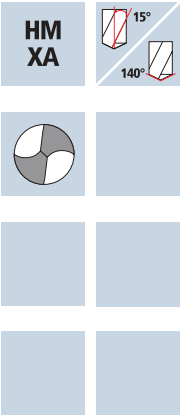
				HRC 48-56	HRC 56-60	HRC > 60			
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Example: Order-N°.							DURO-VD	
Article-N°.							B52112	
ø-Code								
Ø Code	d ₁ h7	d ₂ h5	l ₁	l ₂	l ₄	L _{max}		
0920	9.20	10.0	89.0	47.0	40	35.0		●
0930	9.30	10.0	89.0	47.0	40	35.0		●
0940	9.40	10.0	89.0	47.0	40	35.0		●
0950	9.50	10.0	89.0	47.0	40	35.0		●
0960	9.60	10.0	89.0	47.0	40	35.0		●
0970	9.70	10.0	89.0	47.0	40	35.0		●
0980	9.80	10.0	89.0	47.0	40	35.0		●
0990	9.90	10.0	89.0	47.0	40	35.0		●
1000	10.00	10.0	89.0	47.0	40	35.0		●
1010	10.10	12.0	102.0	55.0	45	40.0		●
1020	10.20	12.0	102.0	55.0	45	40.0		●
1030	10.30	12.0	102.0	55.0	45	40.0		●
1040	10.40	12.0	102.0	55.0	45	40.0		●
1050	10.50	12.0	102.0	55.0	45	40.0		●
1060	10.60	12.0	102.0	55.0	45	40.0		●
1070	10.70	12.0	102.0	55.0	45	40.0		●
1080	10.80	12.0	102.0	55.0	45	40.0		●
1090	10.90	12.0	102.0	55.0	45	40.0		●
1100	11.00	12.0	102.0	55.0	45	40.0		●
1110	11.10	12.0	102.0	55.0	45	40.0		●
1120	11.20	12.0	102.0	55.0	45	40.0		●
1130	11.30	12.0	102.0	55.0	45	40.0		●
1140	11.40	12.0	102.0	55.0	45	40.0		●

Application	Material	d_1 [mm]	v_c [m/min]	f [mm]	n [min ⁻¹]	v_f [mm/min]	Q [cm ³ /min]
	Hardened tool steel 42 - 48 HRC 	11.50	35	0.1370	970	133	13.8
		11.80	35	0.1390	945	131	14.4
		12.00	35	0.1410	930	131	14.8
		12.50	35	0.1440	890	128	15.7
		13.00	35	0.1480	855	127	16.8
		14.00	35	0.1550	795	123	19.0
		14.80	35	0.1610	755	122	20.9
		15.50	35	0.1650	720	119	22.4
		16.50	35	0.1720	675	116	24.8
	Hardened tool steel 48 - 52 HRC 	11.50	30	0.1370	830	114	11.8
		11.80	30	0.1390	810	113	12.3
		12.00	30	0.1410	795	112	12.7
		12.50	30	0.1440	765	110	13.5
		13.00	30	0.1480	735	109	14.4
		14.00	30	0.1550	680	105	16.2
		14.80	30	0.1610	645	104	17.9
		15.50	30	0.1650	615	102	19.2
		16.50	30	0.1720	580	100	21.3
	Hardened tool steel 52 - 56 HRC 	11.50	30	0.1370	830	114	11.8
		11.80	30	0.1390	810	113	12.3
		12.00	30	0.1410	795	112	12.7
		12.50	30	0.1440	765	110	13.5
		13.00	30	0.1480	735	109	14.4
		14.00	30	0.1550	680	105	16.2
		14.80	30	0.1610	645	104	17.9
		15.50	30	0.1650	615	102	19.2
		16.50	30	0.1720	580	100	21.3
	Hardened tool steel 56 - 60 HRC  	11.50	25	0.0890	690	61	6.4
		11.80	25	0.0900	675	61	6.6
		12.00	25	0.0910	665	61	6.8
		12.50	25	0.0940	635	60	7.3
		13.00	25	0.0960	610	59	7.8
		14.00	25	0.1010	570	58	8.9
		14.80	25	0.1050	540	57	9.8
		15.50	25	0.1080	515	56	10.5
		16.50	25	0.1120	480	54	11.5
	Hardened tool steel > 60 HRC  	11.50	10	0.0750	275	21	2.1
		11.80	10	0.0760	270	21	2.2
		12.00	10	0.0770	265	20	2.3
		12.50	10	0.0790	255	20	2.5
		13.00	10	0.0820	245	20	2.7
		14.00	10	0.0850	225	19	2.9
		14.80	10	0.0880	215	19	3.3
		15.50	10	0.0910	205	19	3.5
		16.50	10	0.0940	195	18	3.9

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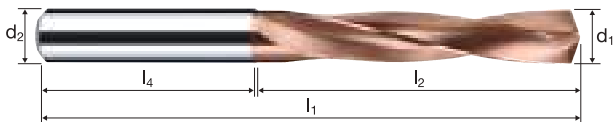
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				HRC 48-56	HRC 56-60	HRC > 60			
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Example: Order-Nº.							DURO-VD	
Article-Nº. ø-Code							B52112	
Example: B52112 1150								
Ø Code	d1 h7	d2 h5	l1	l2	l4	Lmax		
1150	11.50	12.0	102.0	55.0	45	40.0		●
1160	11.60	12.0	102.0	55.0	45	40.0		●
1170	11.70	12.0	102.0	55.0	45	40.0		●
1180	11.80	12.0	102.0	55.0	45	40.0		●
1190	11.90	12.0	102.0	55.0	45	40.0		●
1200	12.00	12.0	102.0	55.0	45	40.0		●
1220	12.20	14.0	107.0	60.0	45	43.0		●
1250	12.50	14.0	107.0	60.0	45	43.0		●
1280	12.80	14.0	107.0	60.0	45	43.0		●
1300	13.00	14.0	107.0	60.0	45	43.0		●
1350	13.50	14.0	107.0	60.0	45	43.0		●
1380	13.80	14.0	107.0	60.0	45	43.0		●
1400	14.00	14.0	107.0	60.0	45	43.0		●
1420	14.20	16.0	115.0	65.0	48	45.0		●
1450	14.50	16.0	115.0	65.0	48	45.0		●
1480	14.80	16.0	115.0	65.0	48	45.0		●
1500	15.00	16.0	115.0	65.0	48	45.0		●
1520	15.20	16.0	115.0	65.0	48	45.0		●
1550	15.50	16.0	115.0	65.0	48	45.0		●
1580	15.80	16.0	115.0	65.0	48	45.0		●
1600	16.00	16.0	115.0	65.0	48	45.0		●
1650	16.50	18.0	123.0	73.0	48	51.0		●
1680	16.80	18.0	123.0	73.0	48	51.0		●

Application	Material	d_1 [mm]	v_c [m/min]	f [mm]	n [min ⁻¹]	v_f [mm/min]	Q [cm ³ /min]
	Hardened tool steel 42 - 48 HRC 	17.00	35	0.1750	655	115	26.0
		17.50	35	0.1770	635	112	27.0
		17.80	35	0.1790	625	112	27.8
		18.00	35	0.1800	620	112	28.4
		18.50	35	0.1830	600	110	29.5
		18.80	35	0.1840	595	110	30.4
		19.00	35	0.1850	585	108	30.7
		19.50	35	0.1880	570	107	32.0
		20.00	35	0.1900	555	106	33.1
	Hardened tool steel 48 - 52 HRC 	17.00	30	0.1750	560	98	22.2
		17.50	30	0.1770	545	97	23.2
		17.80	30	0.1790	535	96	23.8
		18.00	30	0.1800	530	95	24.3
		18.50	30	0.1830	515	94	25.3
		18.80	30	0.1840	510	94	26.0
		19.00	30	0.1850	505	93	26.5
		19.50	30	0.1880	490	92	27.5
		20.00	30	0.1900	475	90	28.4
	Hardened tool steel 52 - 56 HRC 	17.00	30	0.1750	560	98	22.2
		17.50	30	0.1770	545	97	23.2
		17.80	30	0.1790	535	96	23.8
		18.00	30	0.1800	530	95	24.3
		18.50	30	0.1830	515	94	25.3
		18.80	30	0.1840	510	94	26.0
		19.00	30	0.1850	505	93	26.5
		19.50	30	0.1880	490	92	27.5
		20.00	30	0.1900	475	90	28.4
	Hardened tool steel 56 - 60 HRC  	17.00	25	0.1130	470	53	12.1
		17.50	25	0.1150	455	52	12.6
		17.80	25	0.1160	445	52	12.8
		18.00	25	0.1170	440	52	13.1
		18.50	25	0.1190	430	51	13.8
		18.80	25	0.1200	425	51	14.2
		19.00	25	0.1210	420	51	14.4
		19.50	25	0.1220	410	50	14.9
		20.00	25	0.1240	400	50	15.6
	Hardened tool steel > 60 HRC  	17.00	10	0.0960	185	18	4.0
		17.50	10	0.0980	180	18	4.2
		17.80	10	0.0990	180	18	4.4
		18.00	10	0.0990	175	17	4.4
		18.50	10	0.1010	170	17	4.6
		18.80	10	0.1010	170	17	4.8
		19.00	10	0.1020	170	17	4.9
		19.50	10	0.1030	165	17	5.1
		20.00	10	0.1050	160	17	5.3

3xd



ReTool®

HRC
48-56

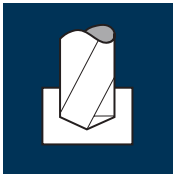
HRC
56-60

HRC
> 60

[illegible]

Application

Material



Steel
< 500 N/mm²



Steel
500 - 850 N/mm²



Steel
850 - 1100 N/mm²



Steel
1100 - 1300 N/mm²



Steel
1300 - 1500 N/mm²



Cold work tool steel
(12% Cr),
high alloyed
[1.2379]



Titanium alloys
> 300 HB
[Ti6Al4V]



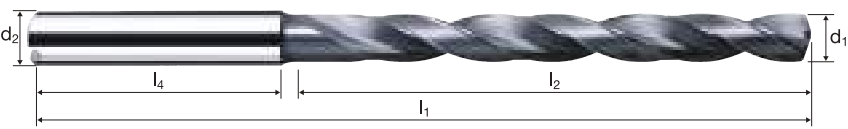
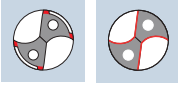
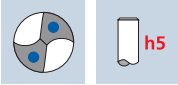
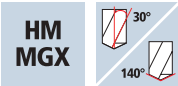
Cast iron
(lamellar / spheroidal)



d ₁ [mm]	v _c [m/min]	f [mm]	n [min ⁻¹]	v _f [mm/min]	Q [cm ³ /min]
3.00	150	0.0800	15915	1273	9.0
3.30	150	0.0900	14470	1302	11.1
3.50	150	0.0950	13640	1296	12.5
3.80	150	0.1050	12565	1319	15.0
4.00	150	0.1100	11935	1313	16.5
4.20	150	0.1200	11370	1364	18.9
4.50	150	0.1400	10610	1485	23.6
4.80	150	0.1450	9945	1442	26.1
5.00	150	0.1550	9550	1480	29.1
3.00	120	0.0700	12730	891	6.3
3.30	120	0.0750	11575	868	7.4
3.50	120	0.0800	10915	873	8.4
3.80	120	0.0900	10050	905	10.3
4.00	120	0.0950	9550	907	11.4
4.20	120	0.1050	9095	955	13.2
4.50	120	0.1200	8490	1019	16.2
4.80	120	0.1250	7960	995	18.0
5.00	120	0.1300	7640	993	19.5
3.00	100	0.0650	10610	690	4.9
3.30	100	0.0700	9645	675	5.8
3.50	100	0.0750	9095	682	6.6
3.80	100	0.0800	8375	670	7.6
4.00	100	0.0900	7960	716	9.0
4.20	100	0.0950	7580	720	10.0
4.50	100	0.1100	7075	778	12.4
4.80	100	0.1150	6630	763	13.8
5.00	100	0.1200	6365	764	15.0
3.00	70	0.0500	7425	371	2.6
3.30	70	0.0550	6750	371	3.2
3.50	70	0.0550	6365	350	3.4
3.80	70	0.0600	5865	352	4.0
4.00	70	0.0650	5570	362	4.6
4.20	70	0.0700	5305	371	5.1
4.50	70	0.0850	4950	421	6.7
4.80	70	0.0900	4640	418	7.6
5.00	70	0.0900	4455	401	7.9
3.00	40	0.0350	4245	149	1.1
3.30	40	0.0400	3860	154	1.3
3.50	40	0.0450	3640	164	1.6
3.80	40	0.0450	3350	151	1.7
4.00	40	0.0500	3185	159	2.0
4.20	40	0.0550	3030	167	2.3
4.50	40	0.0650	2830	184	2.9
4.80	40	0.0700	2655	186	3.4
5.00	40	0.0700	2545	178	3.5
3.00	60	0.0350	6365	223	1.6
3.30	60	0.0400	5785	231	2.0
3.50	60	0.0450	5455	246	2.4
3.80	60	0.0450	5025	226	2.6
4.00	60	0.0500	4775	239	3.0
4.20	60	0.0550	4545	250	3.5
4.50	60	0.0650	4245	276	4.4
4.80	60	0.0700	3980	279	5.0
5.00	60	0.0700	3820	267	5.3
3.00	35	0.0350	3715	130	0.9
3.30	35	0.0400	3375	135	1.2
3.50	35	0.0450	3185	143	1.4
3.80	35	0.0450	2930	132	1.5
4.00	35	0.0500	2785	139	1.8
4.20	35	0.0550	2655	146	2.0
4.50	35	0.0650	2475	161	2.6
4.80	35	0.0700	2320	162	2.9
5.00	35	0.0700	2230	156	3.1
3.00	220	0.0750	23345	1751	12.4
3.30	220	0.0800	21220	1698	14.5
3.50	220	0.0850	20010	1701	16.4
3.80	220	0.0950	18430	1751	19.9
4.00	220	0.1000	17505	1751	22.0
4.20	220	0.1100	16675	1834	25.4
4.50	220	0.1250	15560	1945	30.9
4.80	220	0.1350	14590	1970	35.6
5.00	220	0.1400	14005	1961	38.5

Spiral flute drills XDrill®

8xd

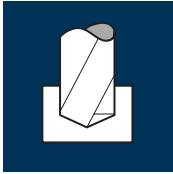


ReTool®

Rm <850 HRC <24	Rm 850-1100 HRC 24-34	Rm 1100-1300 HRC 34-42	Rm 1300-1500 HRC 42-48				Inox Stainless	Ti Titanium	GG(G)
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Example: Order-N°.							DURO-X	
Article-N°.							B72020	
ø-Code								
Ø Code	d1 m7	d2 h5	l1	l2	l4	Lmax		
0300	3.00	6.0	73.0	31.7	36	27.2		●
0310	3.10	6.0	73.0	31.8	36	27.2		●
0320	3.20	6.0	73.0	31.8	36	27.0		●
0330	3.30	6.0	73.0	31.9	36	27.0		●
0340	3.40	6.0	73.0	31.9	36	26.8		●
0350	3.50	6.0	73.0	32.0	36	26.8		●
0360	3.60	6.0	73.0	32.0	36	26.6		●
0370	3.70	6.0	73.0	32.1	36	26.6		●
0380	3.80	6.0	82.0	41.1	36	35.4		●
0390	3.90	6.0	82.0	41.2	36	35.4		●
0400	4.00	6.0	82.0	40.9	36	34.9		●
0410	4.10	6.0	82.0	41.0	36	34.9		●
0420	4.20	6.0	82.0	41.1	36	34.8		●
0430	4.30	6.0	82.0	41.1	36	34.7		●
0440	4.40	6.0	82.0	41.2	36	34.6		●
0450	4.50	6.0	82.0	41.3	36	34.6		●
0460	4.60	6.0	82.0	41.4	36	34.5		●
0470	4.70	6.0	82.0	41.5	36	34.5		●
0480	4.80	6.0	95.0	54.6	36	47.4		●
0490	4.90	6.0	95.0	54.6	36	47.3		●
0500	5.00	6.0	95.0	55.2	36	47.7		●
0510	5.10	6.0	95.0	55.3	36	47.7		●
0520	5.20	6.0	95.0	55.4	36	47.6		●

Application



Material

Steel
< 500 N/mm²



Steel
500 - 850 N/mm²



Steel
850 - 1100 N/mm²



Steel
1100 - 1300 N/mm²



Steel
1300 - 1500 N/mm²



Cold work tool steel
(12% Cr),
high alloyed
[1.2379]



Titanium alloys
> 300 HB
[Ti6Al4V]



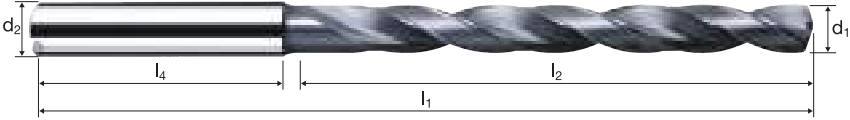
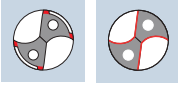
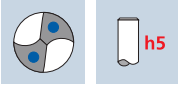
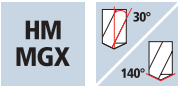
Cast iron
(lamellar / spheroidal)



d ₁ [mm]	v _c [m/min]	f [mm]	n [min ⁻¹]	v _f [mm/min]	Q [cm ³ /min]
5.50	150	0.1700	8680	1476	35.1
5.80	150	0.1800	8230	1481	39.1
6.00	150	0.1900	7960	1512	42.8
6.20	150	0.2050	7700	1579	47.7
6.50	150	0.2100	7345	1543	51.2
6.80	150	0.2200	7020	1544	56.1
7.00	150	0.2300	6820	1569	60.4
7.20	150	0.2350	6630	1558	63.4
7.50	150	0.2450	6365	1559	68.9
5.50	120	0.1450	6945	1007	23.9
5.80	120	0.1500	6585	988	26.1
6.00	120	0.1650	6365	1050	29.7
6.20	120	0.1750	6160	1078	32.5
6.50	120	0.1800	5875	1058	35.1
6.80	120	0.1900	5615	1067	38.7
7.00	120	0.1950	5455	1064	40.9
7.20	120	0.2000	5305	1061	43.2
7.50	120	0.2100	5095	1070	47.3
5.50	100	0.1350	5785	781	18.6
5.80	100	0.1400	5490	769	20.3
6.00	100	0.1500	5305	796	22.5
6.20	100	0.1600	5135	822	24.8
6.50	100	0.1700	4895	832	27.6
6.80	100	0.1750	4680	819	29.7
7.00	100	0.1800	4545	818	31.5
7.20	100	0.1850	4420	818	33.3
7.50	100	0.1950	4245	828	36.6
5.50	70	0.1000	4050	405	9.6
5.80	70	0.1050	3840	403	10.7
6.00	70	0.1150	3715	427	12.1
6.20	70	0.1200	3595	431	13.0
6.50	70	0.1250	3430	429	14.2
6.80	70	0.1350	3275	442	16.1
7.00	70	0.1350	3185	430	16.5
7.20	70	0.1400	3095	433	17.6
7.50	70	0.1450	2970	431	19.0
5.50	40	0.0800	2315	185	4.4
5.80	40	0.0800	2195	176	4.6
6.00	40	0.0900	2120	191	5.4
6.20	40	0.0950	2055	195	5.9
6.50	40	0.1000	1960	196	6.5
6.80	40	0.1050	1870	196	7.1
7.00	40	0.1050	1820	191	7.4
7.20	40	0.1100	1770	195	7.9
7.50	40	0.1150	1700	196	8.6
5.50	60	0.0800	3470	278	6.6
5.80	60	0.0800	3295	264	7.0
6.00	60	0.0900	3185	287	8.1
6.20	60	0.0950	3080	293	8.8
6.50	60	0.1000	2940	294	9.8
6.80	60	0.1050	2810	295	10.7
7.00	60	0.1050	2730	287	11.0
7.20	60	0.1100	2655	292	11.9
7.50	60	0.1150	2545	293	12.9
5.50	35	0.0800	2025	162	3.8
5.80	35	0.0800	1920	154	4.1
6.00	35	0.0900	1855	167	4.7
6.20	35	0.0950	1795	171	5.1
6.50	35	0.1000	1715	172	5.7
6.80	35	0.1050	1640	172	6.3
7.00	35	0.1050	1590	167	6.4
7.20	35	0.1100	1545	170	6.9
7.50	35	0.1150	1485	171	7.5
5.50	220	0.1550	12730	1973	46.9
5.80	220	0.1600	12075	1932	51.0
6.00	220	0.1750	11670	2042	57.7
6.20	220	0.1850	11295	2090	63.1
6.50	220	0.1950	10775	2101	69.7
6.80	220	0.2000	10300	2060	74.8
7.00	220	0.2100	10005	2101	80.9
7.20	220	0.2150	9725	2091	85.1
7.50	220	0.2250	9335	2100	92.8

Spiral flute drills XDrill®

8xd



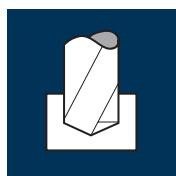
ReTool®

Rm <850 HRC <24	Rm 850-1100 HRC 24-34	Rm 1100-1300 HRC 34-42	Rm 1300-1500 HRC 42-48				Inox Stainless	Ti Titanium	GG(G)
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Example: Order-N°.							Article-N°.		ø-Code		DURO-X	
							B72020		0530		B72020	
Ø Code	d1 m7	d2 h5	l1	l2	l4	Lmax						
0530	5.30	6.0	95.0	55.5	36	47.6					●	
0540	5.40	6.0	95.0	55.6	36	47.5					●	
0550	5.50	6.0	95.0	55.7	36	47.5					●	
0560	5.60	6.0	95.0	55.8	36	47.4					●	
0570	5.70	6.0	95.0	55.9	36	47.4					●	
0580	5.80	6.0	95.0	56.0	36	47.3					●	
0590	5.90	6.0	95.0	56.2	36	47.4					●	
0600	6.00	6.0	95.0	56.2	36	47.2					●	
0610	6.10	8.0	105.0	64.4	36	55.3					●	
0620	6.20	8.0	105.0	64.5	36	55.2					●	
0630	6.30	8.0	105.0	64.6	36	55.2					●	
0640	6.40	8.0	105.0	64.7	36	55.1					●	
0650	6.50	8.0	105.0	64.8	36	55.1					●	
0660	6.60	8.0	105.0	64.9	36	55.0					●	
0670	6.70	8.0	105.0	65.0	36	55.0					●	
0680	6.80	8.0	105.0	65.0	36	54.8					●	
0690	6.90	8.0	105.0	65.1	36	54.8					●	
0700	7.00	8.0	105.0	65.2	36	54.7					●	
0710	7.10	8.0	115.0	75.3	36	64.7					●	
0720	7.20	8.0	115.0	75.4	36	64.6					●	
0730	7.30	8.0	115.0	75.5	36	64.6					●	
0740	7.40	8.0	115.0	75.5	36	64.4					●	
0750	7.50	8.0	115.0	75.6	36	64.4					●	

Application

Material



Steel
< 500 N/mm²



Steel
500 - 850 N/mm²



Steel
850 - 1100 N/mm²



Steel
1100 - 1300 N/mm²



Steel
1300 - 1500 N/mm²



Cold work tool steel
(12% Cr),
high alloyed
[1.2379]



Titanium alloys
> 300 HB
[Ti6Al4V]



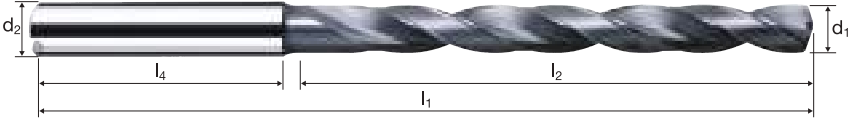
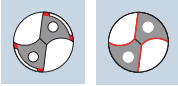
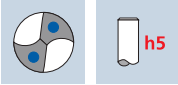
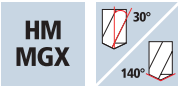
Cast iron
(lamellar / spheroidal)



d ₁ [mm]	v _c [m/min]	f [mm]	n [min ⁻¹]	v _f [mm/min]	Q [cm ³ /min]
7.60	150	0.2500	6280	1570	71.2
8.00	150	0.2600	5970	1552	78.0
8.20	150	0.2700	5825	1573	83.1
8.50	150	0.2800	5615	1572	89.2
8.80	150	0.2850	5425	1546	94.0
9.00	150	0.2950	5305	1565	99.6
9.20	150	0.3000	5190	1557	103.5
9.50	150	0.3100	5025	1558	110.4
9.80	150	0.3200	4870	1558	117.5
7.60	120	0.2150	5025	1080	49.0
8.00	120	0.2250	4775	1074	54.0
8.20	120	0.2300	4660	1072	56.6
8.50	120	0.2400	4495	1079	61.2
8.80	120	0.2450	4340	1063	64.7
9.00	120	0.2500	4245	1061	67.5
9.20	120	0.2600	4150	1079	71.7
9.50	120	0.2650	4020	1065	75.5
9.80	120	0.2750	3900	1073	80.9
7.60	100	0.1950	4190	817	37.1
8.00	100	0.2050	3980	816	41.0
8.20	100	0.2100	3880	815	43.0
8.50	100	0.2200	3745	824	46.8
8.80	100	0.2250	3615	813	49.5
9.00	100	0.2300	3535	813	51.7
9.20	100	0.2350	3460	813	54.1
9.50	100	0.2450	3350	821	58.2
9.80	100	0.2550	3250	829	62.5
7.60	70	0.1500	2930	440	19.9
8.00	70	0.1550	2785	432	21.7
8.20	70	0.1600	2715	434	22.9
8.50	70	0.1650	2620	432	24.5
8.80	70	0.1700	2530	430	26.2
9.00	70	0.1750	2475	433	27.6
9.20	70	0.1800	2420	436	29.0
9.50	70	0.1850	2345	434	30.7
9.80	70	0.1900	2275	432	32.6
7.60	40	0.1150	1675	193	8.7
8.00	40	0.1200	1590	191	9.6
8.20	40	0.1250	1555	194	10.3
8.50	40	0.1300	1500	195	11.1
8.80	40	0.1350	1445	195	11.9
9.00	40	0.1350	1415	191	12.2
9.20	40	0.1400	1385	194	12.9
9.50	40	0.1450	1340	194	13.8
9.80	40	0.1500	1300	195	14.7
7.60	60	0.1150	2515	289	13.1
8.00	60	0.1200	2385	286	14.4
8.20	60	0.1250	2330	291	15.4
8.50	60	0.1300	2245	292	16.6
8.80	60	0.1350	2170	293	17.8
9.00	60	0.1350	2120	286	18.2
9.20	60	0.1400	2075	291	19.3
9.50	60	0.1450	2010	292	20.7
9.80	60	0.1500	1950	293	22.1
7.60	35	0.1150	1465	169	7.6
8.00	35	0.1200	1395	167	8.4
8.20	35	0.1250	1360	170	9.0
8.50	35	0.1300	1310	170	9.7
8.80	35	0.1350	1265	171	10.4
9.00	35	0.1350	1240	167	10.6
9.20	35	0.1400	1210	169	11.3
9.50	35	0.1450	1175	170	12.1
9.80	35	0.1500	1135	170	12.8
7.60	220	0.2250	9215	2073	94.1
8.00	220	0.2400	8755	2101	105.6
8.20	220	0.2450	8540	2092	110.5
8.50	220	0.2500	8240	2060	116.9
8.80	220	0.2600	7960	2070	125.9
9.00	220	0.2650	7780	2062	131.2
9.20	220	0.2750	7610	2093	139.1
9.50	220	0.2800	7370	2064	146.3
9.80	220	0.2900	7145	2072	156.3

Spiral flute drills XDrill®

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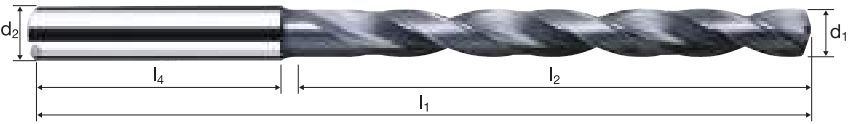
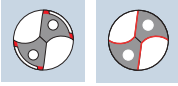
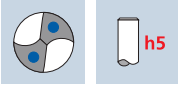
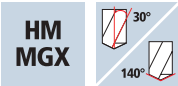
Rm <850 HRC <24	Rm 850-1100 HRC 24-34	Rm 1100-1300 HRC 34-42	Rm 1300-1500 HRC 42-48				Inox Stainless	Ti Titanium	GG(G)
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Example: Order-N°.							DURO-X	
Article-N°. ø-Code							B72020	
Order-N°.								
Ø Code	d1 m7	d2 h5	l1	l2	l4	Lmax		
0760	7.60	8.0	115.0	75.7	36	64.3		●
0770	7.70	8.0	115.0	75.9	36	64.4		●
0780	7.80	8.0	115.0	76.0	36	64.3		●
0790	7.90	8.0	115.0	76.1	36	64.3		●
0800	8.00	8.0	115.0	76.1	36	64.1		●
0810	8.10	10.0	129.0	84.4	40	72.3		●
0820	8.20	10.0	129.0	84.5	40	72.2		●
0830	8.30	10.0	129.0	84.6	40	72.2		●
0840	8.40	10.0	129.0	84.7	40	72.1		●
0850	8.50	10.0	129.0	84.7	40	72.0		●
0860	8.60	10.0	129.0	84.8	40	71.9		●
0870	8.70	10.0	129.0	84.9	40	71.9		●
0880	8.80	10.0	129.0	85.0	40	71.8		●
0890	8.90	10.0	129.0	85.1	40	71.8		●
0900	9.00	10.0	129.0	85.2	40	71.7		●
0910	9.10	10.0	138.0	94.3	40	80.7		●
0920	9.20	10.0	138.0	94.3	40	80.5		●
0930	9.30	10.0	138.0	94.4	40	80.5		●
0940	9.40	10.0	138.0	94.5	40	80.4		●
0950	9.50	10.0	138.0	94.6	40	80.4		●
0960	9.60	10.0	138.0	94.7	40	80.3		●
0970	9.70	10.0	138.0	94.8	40	80.3		●
0980	9.80	10.0	138.0	94.9	40	80.2		●

Application	Material	d_1 [mm]	v_c [m/min]	f [mm]	n [min ⁻¹]	v_f [mm/min]	Q [cm ³ /min]
	Steel < 500 N/mm ² 	10.00	150	0.3250	4775	1552	121.9
		10.20	150	0.3350	4680	1568	128.1
		10.50	150	0.3450	4545	1568	135.8
		10.80	150	0.3500	4420	1547	141.7
		11.00	150	0.3550	4340	1541	146.4
		11.50	150	0.3600	4150	1494	155.2
		11.80	150	0.3600	4045	1456	159.2
		12.00	150	0.3700	3980	1473	166.5
		12.50	150	0.3850	3820	1471	180.5
		12.50	150	0.3850	3820	1471	180.5
	Steel 500 - 850 N/mm ²	10.00	120	0.2800	3820	1070	84.0
		10.20	120	0.2850	3745	1067	87.2
		10.50	120	0.2950	3640	1074	93.0
		10.80	120	0.3000	3535	1061	97.2
		11.00	120	0.3050	3470	1058	100.6
		11.50	120	0.3100	3320	1029	106.9
		11.80	120	0.3100	3235	1003	109.7
		12.00	120	0.3150	3185	1003	113.5
		12.50	120	0.3300	3055	1008	123.7
		12.50	120	0.3300	3055	1008	123.7
	Steel 850 - 1100 N/mm ²	10.00	100	0.2600	3185	828	65.0
		10.20	100	0.2650	3120	827	67.6
		10.50	100	0.2700	3030	818	70.8
		10.80	100	0.2750	2945	810	74.2
		11.00	100	0.2800	2895	811	77.0
		11.50	100	0.2850	2770	790	82.0
		11.80	100	0.2850	2700	770	84.2
		12.00	100	0.2900	2655	770	87.1
		12.50	100	0.3050	2545	776	95.3
		12.50	100	0.3050	2545	776	95.3
	Steel 1100 - 1300 N/mm ²	10.00	70	0.1950	2230	435	34.2
		10.20	70	0.2000	2185	437	35.7
		10.50	70	0.2050	2120	435	37.6
		10.80	70	0.2100	2065	434	39.7
		11.00	70	0.2150	2025	435	41.4
		11.50	70	0.2150	1940	417	43.3
		11.80	70	0.2150	1890	406	44.4
		12.00	70	0.2200	1855	408	46.2
		12.50	70	0.2300	1785	411	50.4
		12.50	70	0.2300	1785	411	50.4
	Steel 1300 - 1500 N/mm ²	10.00	40	0.1500	1275	191	15.0
		10.20	40	0.1550	1250	194	15.8
		10.50	40	0.1600	1215	194	16.8
		10.80	40	0.1600	1180	189	17.3
		11.00	40	0.1650	1155	191	18.1
		11.50	40	0.1650	1105	182	18.9
		11.80	40	0.1650	1080	178	19.5
		12.00	40	0.1700	1060	180	20.4
		12.50	40	0.1750	1020	179	21.9
		12.50	40	0.1750	1020	179	21.9
	Cold work tool steel (12% Cr), high alloyed [1.2379]	10.00	60	0.1500	1910	287	22.5
		10.20	60	0.1550	1870	290	23.7
		10.50	60	0.1600	1820	291	25.2
		10.80	60	0.1600	1770	283	25.9
		11.00	60	0.1650	1735	286	27.2
		11.50	60	0.1650	1660	274	28.4
		11.80	60	0.1650	1620	267	29.2
		12.00	60	0.1700	1590	270	30.6
		12.50	60	0.1750	1530	268	32.9
		12.50	60	0.1750	1530	268	32.9
	Titanium alloys > 300 HB [Ti6Al4V]	10.00	35	0.1500	1115	167	13.1
		10.20	35	0.1550	1090	169	13.8
		10.50	35	0.1600	1060	170	14.7
		10.80	35	0.1600	1030	165	15.1
		11.00	35	0.1650	1015	168	15.9
		11.50	35	0.1650	970	160	16.6
		11.80	35	0.1650	945	156	17.0
		12.00	35	0.1700	930	158	17.9
		12.50	35	0.1750	890	156	19.1
		12.50	35	0.1750	890	156	19.1
 	Cast iron (lamellar / spheroidal)	10.00	220	0.2950	7005	2067	162.3
		10.20	220	0.3050	6865	2094	171.1
		10.50	220	0.3100	6670	2068	179.0
		10.80	220	0.3150	6485	2043	187.1
		11.00	220	0.3250	6365	2069	196.6
		11.50	220	0.3300	6090	2010	208.7
		11.80	220	0.3300	5935	1959	214.2
		12.00	220	0.3350	5835	1955	221.1
		12.50	220	0.3500	5600	1960	240.5
		12.50	220	0.3500	5600	1960	240.5

Spiral flute drills XDrill®

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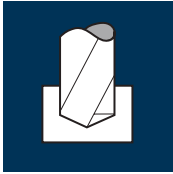
ReTool®

Rm <850 HRC <24	Rm 850-1100 HRC 24-34	Rm 1100-1300 HRC 34-42	Rm 1300-1500 HRC 42-48				Inox Stainless	Ti Titanium	GG(G)
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Example: Order-Nº.							DURO-X	
Article-Nº. ø-Code							B72020	
0990 0990								
Ø Code	d1 m7	d2 h5	l1	l2	l4	Lmax		
0990	9.90	10.0	138.0	95.1	40	80.3		●
1000	10.00	10.0	138.0	95.0	40	80.0		●
1010	10.10	12.0	153.0	103.4	45	88.3		●
1020	10.20	12.0	153.0	103.5	45	88.2		●
1030	10.30	12.0	153.0	103.5	45	88.1		●
1040	10.40	12.0	153.0	103.6	45	88.0		●
1050	10.50	12.0	153.0	103.7	45	88.0		●
1060	10.60	12.0	153.0	103.8	45	87.9		●
1070	10.70	12.0	153.0	103.9	45	87.9		●
1080	10.80	12.0	153.0	104.0	45	87.8		●
1090	10.90	12.0	153.0	104.1	45	87.8		●
1100	11.00	12.0	153.0	104.1	45	87.6		●
1110	11.10	12.0	162.0	113.2	45	96.6		●
1120	11.20	12.0	162.0	113.3	45	96.5		●
1130	11.30	12.0	162.0	113.4	45	96.5		●
1140	11.40	12.0	162.0	113.5	45	96.4		●
1150	11.50	12.0	162.0	113.6	45	96.4		●
1160	11.60	12.0	162.0	113.7	45	96.3		●
1170	11.70	12.0	162.0	113.8	45	96.3		●
1180	11.80	12.0	162.0	113.9	45	96.2		●
1190	11.90	12.0	162.0	114.0	45	96.2		●
1200	12.00	12.0	162.0	113.9	45	95.9		●
1250	12.50	14.0	181.0	131.7	45	113.0		●

Application

Material



Steel
< 500 N/mm²



Steel
500 - 850 N/mm²



Steel
850 - 1100 N/mm²



Steel
1100 - 1300 N/mm²



Steel
1300 - 1500 N/mm²



Cold work tool steel
(12% Cr),
high alloyed
[1.2379]



Titanium alloys
> 300 HB
[Ti6Al4V]

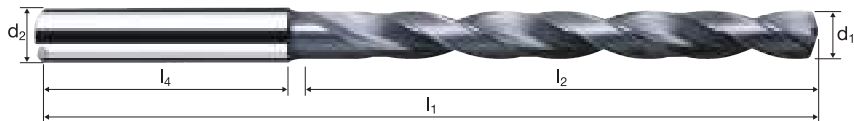


Cast iron
(lamellar / spheroidal)



d ₁ [mm]	v _c [m/min]	f [mm]	n [min ⁻¹]	v _f [mm/min]	Q [cm ³ /min]
12.80	150	0.3950	3730	1473	189.6
13.00	150	0.4000	3675	1470	195.1
13.50	150	0.4050	3535	1432	204.9
14.00	150	0.4100	3410	1398	215.2
14.50	150	0.4200	3295	1384	228.5
14.80	150	0.4250	3225	1371	235.8
15.00	150	0.4300	3185	1370	242.0
15.50	150	0.4400	3080	1355	255.7
16.00	150	0.4500	2985	1343	270.1
12.80	120	0.3350	2985	1000	128.7
13.00	120	0.3400	2940	1000	132.7
13.50	120	0.3450	2830	976	139.8
14.00	120	0.3500	2730	956	147.1
14.50	120	0.3600	2635	949	156.6
14.80	120	0.3650	2580	942	162.0
15.00	120	0.3700	2545	942	166.4
15.50	120	0.3750	2465	924	174.4
16.00	120	0.3850	2385	918	184.6
12.80	100	0.3100	2485	770	99.1
13.00	100	0.3150	2450	772	102.4
13.50	100	0.3200	2360	755	108.1
14.00	100	0.3250	2275	739	113.8
14.50	100	0.3300	2195	724	119.6
14.80	100	0.3350	2150	720	123.9
15.00	100	0.3400	2120	721	127.4
15.50	100	0.3450	2055	709	133.8
16.00	100	0.3550	1990	707	142.1
12.80	70	0.2350	1740	409	52.6
13.00	70	0.2400	1715	412	54.6
13.50	70	0.2450	1650	404	57.9
14.00	70	0.2450	1590	390	60.0
14.50	70	0.2500	1535	384	63.4
14.80	70	0.2550	1505	384	66.0
15.00	70	0.2600	1485	386	68.2
15.50	70	0.2650	1440	382	72.0
16.00	70	0.2700	1395	377	75.7
12.80	40	0.1800	995	179	23.0
13.00	40	0.1850	980	181	24.1
13.50	40	0.1850	945	175	25.0
14.00	40	0.1900	910	173	26.6
14.50	40	0.1950	880	172	28.3
14.80	40	0.1950	860	168	28.9
15.00	40	0.2000	850	170	30.0
15.50	40	0.2050	820	168	31.7
16.00	40	0.2050	795	163	32.8
12.80	60	0.1800	1490	268	34.5
13.00	60	0.1850	1470	272	36.1
13.50	60	0.1850	1415	262	37.5
14.00	60	0.1900	1365	259	39.9
14.50	60	0.1950	1315	256	42.3
14.80	60	0.1950	1290	252	43.3
15.00	60	0.2000	1275	255	45.1
15.50	60	0.2050	1230	252	47.6
16.00	60	0.2050	1195	245	49.3
12.80	35	0.1800	870	157	20.2
13.00	35	0.1850	855	158	21.0
13.50	35	0.1850	825	153	21.8
14.00	35	0.1900	795	151	23.3
14.50	35	0.1950	770	150	24.8
14.80	35	0.1950	755	147	25.3
15.00	35	0.2000	745	149	26.3
15.50	35	0.2050	720	148	27.9
16.00	35	0.2050	695	143	28.7
12.80	220	0.3550	5470	1942	249.9
13.00	220	0.3600	5385	1939	257.3
13.50	220	0.3700	5185	1919	274.6
14.00	220	0.3750	5000	1875	288.6
14.50	220	0.3800	4830	1835	303.1
14.80	220	0.3850	4730	1821	313.3
15.00	220	0.3900	4670	1821	321.9
15.50	220	0.4000	4520	1808	341.2
16.00	220	0.4050	4375	1772	356.3

8xd



ReTool®

Rm ≤850 HRC ≤24	Rm 850-1100 HRC 24-34	Rm 1100-1300 HRC 34-42	Rm 1300-1500 HRC 42-48				Inox Stainless	Ti Titanium	GG(G)
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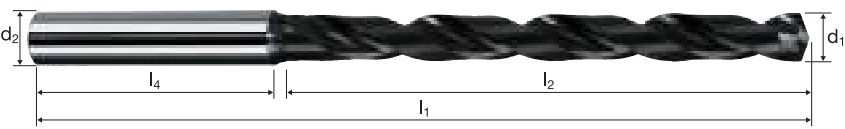
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Application	Material	d_1 [mm]	v_c [m/min]	f [mm]	n [min ⁻¹]	v_f [mm/min]	Q [cm ³ /min]
	Steel < 500 N/mm ² 	4.00	130	0.0850	10345	879	11.0
		5.00	130	0.1050	8275	869	17.1
		6.00	130	0.1250	6895	862	24.4
		7.00	130	0.1450	5910	857	33.0
		8.00	130	0.1700	5175	880	44.2
		9.00	130	0.1900	4600	874	55.6
		10.00	130	0.2100	4140	869	68.3
		11.00	130	0.2300	3760	865	82.2
		12.00	130	0.2550	3450	880	99.5
	Steel 500 - 850 N/mm ²	4.00	100	0.0850	7960	677	8.5
		5.00	100	0.1050	6365	668	13.1
		6.00	100	0.1250	5305	663	18.7
		7.00	100	0.1450	4545	659	25.4
		8.00	100	0.1700	3980	677	34.0
		9.00	100	0.1900	3535	672	42.7
		10.00	100	0.2100	3185	669	52.5
		11.00	100	0.2300	2895	666	63.3
		12.00	100	0.2550	2655	677	76.6
	Steel 850 - 1100 N/mm ²	4.00	70	0.0650	5570	362	4.6
		5.00	70	0.0800	4455	356	7.0
		6.00	70	0.0950	3715	353	10.0
		7.00	70	0.1100	3185	350	13.5
		8.00	70	0.1300	2785	362	18.2
		9.00	70	0.1450	2475	359	22.8
		10.00	70	0.1600	2230	357	28.0
		11.00	70	0.1750	2025	354	33.7
		12.00	70	0.1900	1855	353	39.9
	Steel 1100 - 1300 N/mm ²	4.00	50	0.0550	3980	219	2.8
		5.00	50	0.0650	3185	207	4.1
		6.00	50	0.0800	2655	212	6.0
		7.00	50	0.0950	2275	216	8.3
		8.00	50	0.1050	1990	209	10.5
		9.00	50	0.1200	1770	212	13.5
		10.00	50	0.1350	1590	215	16.9
		11.00	50	0.1450	1445	210	19.9
		12.00	50	0.1600	1325	212	24.0
	Stainless steel [Cr-Ni/1.4301]	4.00	50	0.0450	3980	179	2.3
		5.00	50	0.0550	3185	175	3.4
		6.00	50	0.0700	2655	186	5.3
		7.00	50	0.0800	2275	182	7.0
		8.00	50	0.0900	1990	179	9.0
		9.00	50	0.1050	1770	186	11.8
		10.00	50	0.1150	1590	183	14.4
		11.00	50	0.1250	1445	181	17.2
		12.00	50	0.1350	1325	179	20.2
 	Cast iron (lamellar / spheroidal)	4.00	150	0.0900	11935	1074	13.5
		5.00	150	0.1150	9550	1098	21.6
		6.00	150	0.1350	7960	1075	30.4
		7.00	150	0.1600	6820	1091	42.0
		8.00	150	0.1850	5970	1105	55.5
		9.00	150	0.2050	5305	1088	69.2
		10.00	150	0.2300	4775	1098	86.3
		11.00	150	0.2500	4340	1085	103.1
		12.00	150	0.2750	3980	1095	123.8
	Wrought aluminium alloys Si < 6% hardened	4.00	200	0.0800	15915	1273	16.0
		5.00	200	0.1000	12730	1273	25.0
		6.00	200	0.1200	10610	1273	36.0
		7.00	200	0.1400	9095	1273	49.0
		8.00	200	0.1600	7960	1274	64.0
		9.00	200	0.1800	7075	1274	81.0
		10.00	200	0.2000	6365	1273	100.0
		11.00	200	0.2200	5785	1273	120.9
		12.00	200	0.2400	5305	1273	144.0

Spiral flute drills Supradrill® N

8xd

HM
MG10



ReTool®

Rm
<850
HRC
<24

Rm
850-1100
HRC
24-34

Rm
1100-1300
HRC
34-42

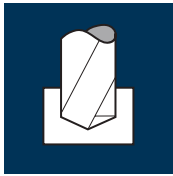
Inox
Stainless

GG(G)
Aluminium

Example: Order-N°.							DURO-SD	
Article-N°.							B52020	
ø-Code							B53020	
Ø Code	d ₁ m7	d ₂ h6	l ₁	l ₂	l ₄	L _{max}		
0400	4.00	6.0	82.0	40.9	36	34.9		●
0420	4.20	6.0	82.0	41.1	36	34.8		●
0450	4.50	6.0	82.0	41.3	36	34.6		●
0480	4.80	6.0	82.0	41.6	36	34.4		●
0500	5.00	6.0	95.0	54.7	36	47.2		●
0550	5.50	6.0	95.0	55.7	36	47.4		●
0580	5.80	6.0	95.0	56.0	36	47.3		●
0600	6.00	6.0	95.0	56.1	36	47.1		●
0650	6.50	8.0	115.0	74.8	36	65.0		●
0680	6.80	8.0	115.0	75.0	36	64.8		●
0700	7.00	8.0	115.0	75.2	36	64.7		●
0750	7.50	8.0	115.0	75.6	36	64.4		●
0780	7.80	8.0	115.0	76.0	36	64.3		●
0800	8.00	8.0	115.0	76.2	36	64.2		●
0850	8.50	10.0	138.0	93.7	40	81.0		●
0900	9.00	10.0	138.0	94.2	40	80.7		●
0950	9.50	10.0	138.0	94.6	40	80.4		●
1000	10.00	10.0	138.0	95.1	40	80.1		●
1050	10.50	12.0	162.0	112.7	45	97.0		●
1100	11.00	12.0	162.0	113.1	45	96.6		●
1150	11.50	12.0	162.0	113.6	45	96.3		●
1200	12.00	12.0	162.0	114.0	45	96.0		●

Application

Material



Steel
< 500 N/mm²



Steel
500 - 850 N/mm²



Steel
850 - 1100 N/mm²



Steel
1100 - 1300 N/mm²



Stainless steel
[Cr-Ni/1.4301]



Cast iron
(lamellar / spheroidal)

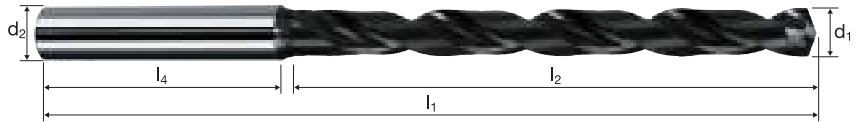


Wrought aluminium alloys
Si < 6%
hardened



d ₁ [mm]	v _c [m/min]	f [mm]	n [min ⁻¹]	v _f [mm/min]	Q [cm ³ /min]
12.50	130	0.2650	3310	877	107.6
13.00	130	0.2750	3185	876	116.3
13.50	130	0.2850	3065	874	125.0
14.00	130	0.2950	2955	872	134.2
14.50	130	0.3050	2855	871	143.8
15.00	130	0.3150	2760	869	153.6
16.00	130	0.3350	2585	866	174.1
12.50	100	0.2650	2545	674	82.8
13.00	100	0.2750	2450	674	89.4
13.50	100	0.2850	2360	673	96.3
14.00	100	0.2950	2275	671	103.3
14.50	100	0.3050	2195	670	110.6
15.00	100	0.3150	2120	668	118.0
16.00	100	0.3350	1990	667	134.0
12.50	70	0.2000	1785	357	43.8
13.00	70	0.2100	1715	360	47.8
13.50	70	0.2150	1650	355	50.8
14.00	70	0.2250	1590	358	55.1
14.50	70	0.2300	1535	353	58.3
15.00	70	0.2400	1485	356	63.0
16.00	70	0.2550	1395	356	71.5
12.50	50	0.1650	1275	210	25.8
13.00	50	0.1750	1225	214	28.5
13.50	50	0.1800	1180	212	30.4
14.00	50	0.1850	1135	210	32.3
14.50	50	0.1950	1100	215	35.4
15.00	50	0.2000	1060	212	37.5
16.00	50	0.2150	995	214	43.0
12.50	50	0.1450	1275	185	22.7
13.00	50	0.1500	1225	184	24.4
13.50	50	0.1550	1180	183	26.2
14.00	50	0.1600	1135	182	28.0
14.50	50	0.1650	1100	182	30.0
15.00	50	0.1700	1060	180	31.8
16.00	50	0.1850	995	184	37.0
12.50	150	0.2850	3820	1089	133.6
13.00	150	0.2950	3675	1084	143.9
13.50	150	0.3100	3535	1096	156.9
14.00	150	0.3200	3410	1091	168.0
14.50	150	0.3300	3295	1087	179.6
15.00	150	0.3450	3185	1099	194.2
16.00	150	0.3650	2985	1090	219.1
12.50	200	0.2500	5095	1274	156.3
13.00	200	0.2600	4895	1273	168.9
13.50	200	0.2700	4715	1273	182.2
14.00	200	0.2800	4545	1273	195.9
14.50	200	0.2900	4390	1273	210.2
15.00	200	0.3000	4245	1274	225.0
16.00	200	0.3200	3980	1274	256.1

8xd

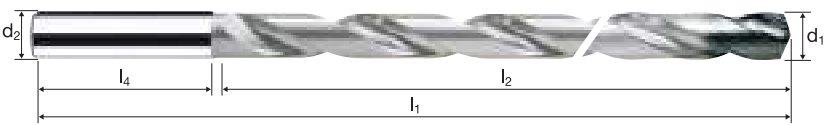
**ReTool[®]**GG(G)
Aluminium[illegible]

Application	Material	d_1 [mm]	v_c [m/min]	f [mm]	n [min ⁻¹]	v_f [mm/min]	Q [cm ³ /min]
	Steel < 500 N/mm ² 	3.00	100	0.160	10610	1698	12.0
		4.00	100	0.190	7960	1512	19.0
		5.00	100	0.215	6365	1368	26.9
		6.00	100	0.245	5305	1300	36.8
		8.00	100	0.300	3980	1194	60.0
		10.00	100	0.350	3185	1115	87.6
		12.00	100	0.400	2655	1062	120.1
		14.00	100	0.445	2275	1012	155.8
		16.00	100	0.485	1990	965	194.0
	Steel 500 - 850 N/mm ² 	3.00	90	0.205	9550	1958	13.8
		4.00	90	0.240	7160	1718	21.6
		5.00	90	0.275	5730	1576	30.9
		6.00	90	0.310	4775	1480	41.8
		8.00	90	0.375	3580	1343	67.5
		10.00	90	0.435	2865	1246	97.9
		12.00	90	0.495	2385	1181	133.6
		14.00	90	0.550	2045	1125	173.2
		16.00	90	0.605	1790	1083	217.8
	Steel 850 - 1100 N/mm ² 	3.00	60	0.140	6365	891	6.3
		4.00	60	0.170	4775	812	10.2
		5.00	60	0.195	3820	745	14.6
		6.00	60	0.220	3185	701	19.8
		8.00	60	0.270	2385	644	32.4
		10.00	60	0.310	1910	592	46.5
		12.00	60	0.350	1590	557	63.0
		14.00	60	0.390	1365	532	81.9
		16.00	60	0.420	1195	502	100.9
	Steel 1100 - 1300 N/mm ² 	3.00	60	0.120	6365	764	5.4
		4.00	60	0.140	4775	669	8.4
		5.00	60	0.160	3820	611	12.0
		6.00	60	0.180	3185	573	16.2
		8.00	60	0.220	2385	525	26.4
		10.00	60	0.250	1910	478	37.5
		12.00	60	0.280	1590	445	50.3
		14.00	60	0.310	1365	423	65.1
		16.00	60	0.335	1195	400	80.4
	Cold work tool steel (12% Cr), high alloyed [1.2379] 	3.00	75	0.170	7960	1353	9.6
		4.00	75	0.200	5970	1194	15.0
		5.00	75	0.230	4775	1098	21.6
		6.00	75	0.265	3980	1055	29.8
		8.00	75	0.320	2985	955	48.0
		10.00	75	0.375	2385	894	70.2
		12.00	75	0.425	1990	846	95.7
		14.00	75	0.475	1705	810	124.7
		16.00	75	0.520	1490	775	155.8
	Cast iron (lamellar / spheroidal) 	3.00	120	0.220	12730	2801	19.8
		4.00	120	0.270	9550	2579	32.4
		5.00	120	0.320	7640	2445	48.0
		6.00	120	0.370	6365	2355	66.6
		8.00	120	0.465	4775	2220	111.6
		10.00	120	0.555	3820	2120	166.5
		12.00	120	0.640	3185	2038	230.5
		14.00	120	0.720	2730	1966	302.6
		16.00	120	0.795	2385	1896	381.2

Deep hole drills

15xd

HM
MGD²



ReTool®

Rm
<850
HRC
<24

Rm
850-1100
HRC
24-34

Rm
1100-1300
HRC
34-42

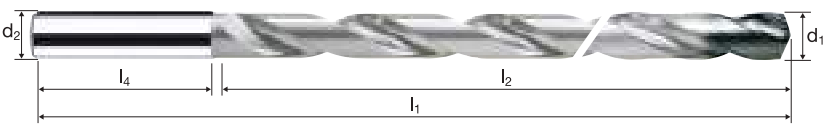
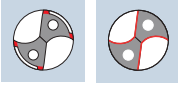
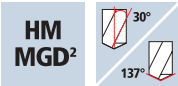
GG(G)

Example: Order-N°.							NANO-L	
Article-N°. B52916 ø-Code 0300							B52916	
Ø Code	d ₁ h7	d ₂ h6	l ₁	l ₂	l ₄	L _{max}		
0300	3.00	4.0	90.0	58.0	28	52.5		●
0350	3.50	4.0	98.0	66.0	28	60.0		●
0400	4.00	4.0	98.0	66.0	28	60.0		●
0450	4.50	5.0	107.0	75.0	28	67.5		●
0500	5.00	5.0	115.0	83.0	28	75.0		●
0550	5.50	6.0	131.0	91.0	36	82.5		●
0600	6.00	6.0	139.0	99.0	36	90.0		●
0700	7.00	8.0	156.0	116.0	36	105.0		●
0800	8.00	8.0	172.0	132.0	36	120.0		●
0900	9.00	10.0	193.0	149.0	40	135.0		●
1000	10.00	10.0	209.0	165.0	40	150.0		●
1100	11.00	12.0	231.0	182.0	45	165.0		●
1200	12.00	12.0	247.0	198.0	45	180.0		●
1300	13.00	14.0	264.0	215.0	45	195.0		●
1400	14.00	14.0	280.0	231.0	45	210.0		●
1500	15.00	16.0	300.0	248.0	48	225.0		●
1600	16.00	16.0	316.0	264.0	48	240.0		●
See page «Technical notes regarding use of deep hole drills»								
A pilot hole is required!								

Application	Material	d_1 [mm]	v_c [m/min]	f [mm]	n [min ⁻¹]	v_f [mm/min]	Q [cm ³ /min]
	Steel < 500 N/mm ² 	3.00	100	0.160	10610	1698	12.0
		4.00	100	0.190	7960	1512	19.0
		5.00	100	0.215	6365	1368	26.9
		6.00	100	0.245	5305	1300	36.8
		8.00	100	0.300	3980	1194	60.0
		10.00	100	0.350	3185	1115	87.6
		12.00	100	0.400	2655	1062	120.1
		14.00	100	0.445	2275	1012	155.8
		16.00	100	0.485	1990	965	194.0
	Steel 500 - 850 N/mm ² 	3.00	90	0.205	9550	1958	13.8
		4.00	90	0.240	7160	1718	21.6
		5.00	90	0.275	5730	1576	30.9
		6.00	90	0.310	4775	1480	41.8
		8.00	90	0.375	3580	1343	67.5
		10.00	90	0.435	2865	1246	97.9
		12.00	90	0.495	2385	1181	133.6
		14.00	90	0.550	2045	1125	173.2
		16.00	90	0.605	1790	1083	217.8
	Steel 850 - 1100 N/mm ² 	3.00	60	0.140	6365	891	6.3
		4.00	60	0.170	4775	812	10.2
		5.00	60	0.195	3820	745	14.6
		6.00	60	0.220	3185	701	19.8
		8.00	60	0.270	2385	644	32.4
		10.00	60	0.310	1910	592	46.5
		12.00	60	0.350	1590	557	63.0
		14.00	60	0.390	1365	532	81.9
		16.00	60	0.420	1195	502	100.9
	Steel 1100 - 1300 N/mm ² 	3.00	60	0.120	6365	764	5.4
		4.00	60	0.140	4775	669	8.4
		5.00	60	0.160	3820	611	12.0
		6.00	60	0.180	3185	573	16.2
		8.00	60	0.220	2385	525	26.4
		10.00	60	0.250	1910	478	37.5
		12.00	60	0.280	1590	445	50.3
		14.00	60	0.310	1365	423	65.1
		16.00	60	0.335	1195	400	80.4
	Cold work tool steel (12% Cr), high alloyed [1.2379] 	3.00	75	0.170	7960	1353	9.6
		4.00	75	0.200	5970	1194	15.0
		5.00	75	0.230	4775	1098	21.6
		6.00	75	0.265	3980	1055	29.8
		8.00	75	0.320	2985	955	48.0
		10.00	75	0.375	2385	894	70.2
		12.00	75	0.425	1990	846	95.7
		14.00	75	0.475	1705	810	124.7
		16.00	75	0.520	1490	775	155.8
	Cast iron (lamellar / spheroidal) 	3.00	120	0.220	12730	2801	19.8
		4.00	120	0.270	9550	2579	32.4
		5.00	120	0.320	7640	2445	48.0
		6.00	120	0.370	6365	2355	66.6
		8.00	120	0.465	4775	2220	111.6
		10.00	120	0.555	3820	2120	166.5
		12.00	120	0.640	3185	2038	230.5
		14.00	120	0.720	2730	1966	302.6
		16.00	120	0.795	2385	1896	381.2

Deep hole drills

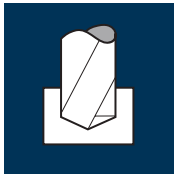
20xd



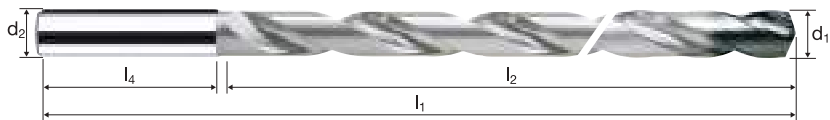
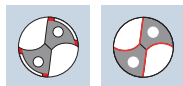
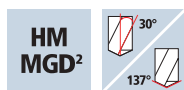
ReTool®

Rm <850 HRC <24	Rm 850-1100 HRC 24-34	Rm 1100-1300 HRC 34-42							GG(G)
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Example: Order-N°. Article-N°. ø-Code B52921 0300							NANO-L	
							B52921	
Ø Code	d ₁ h7	d ₂ h6	l ₁	l ₂	l ₄	L _{max}		
0300	3.00	4.0	108.0	76.0	28	70.0		●
0350	3.50	4.0	118.0	86.0	28	80.0		●
0400	4.00	4.0	118.0	86.0	28	80.0		●
0450	4.50	5.0	129.0	97.0	28	90.0		●
0500	5.00	5.0	140.0	108.0	28	100.0		●
0550	5.50	6.0	159.0	119.0	36	110.0		●
0600	6.00	6.0	169.0	129.0	36	120.0		●
0700	7.00	8.0	191.0	151.0	36	140.0		●
0800	8.00	8.0	212.0	172.0	36	160.0		●
0900	9.00	10.0	238.0	194.0	40	180.0		●
1000	10.00	10.0	259.0	215.0	40	200.0		●
1100	11.00	12.0	286.0	237.0	45	220.0		●
1200	12.00	12.0	307.0	258.0	45	240.0		●
1300	13.00	14.0	329.0	280.0	45	260.0		●
1400	14.00	14.0	350.0	301.0	45	280.0		●
1500	15.00	16.0	375.0	323.0	48	300.0		●
1600	16.00	16.0	396.0	344.0	48	320.0		●

Application	Material	d_1 [mm]	v_c [m/min]	f [mm]	n [min ⁻¹]	v_f [mm/min]	Q [cm ³ /min]
	Steel < 500 N/mm ² 	3.00	100	0.160	10610	1698	12.0
		4.00	100	0.190	7960	1512	19.0
		5.00	100	0.215	6365	1368	26.9
		6.00	100	0.245	5305	1300	36.8
		8.00	100	0.300	3980	1194	60.0
		9.00	100	0.325	3535	1149	73.1
		10.00	100	0.350	3185	1115	87.6
		12.00	100	0.400	2655	1062	120.1
		14.00	100	0.445	2275	1012	155.8
	Steel 500 - 850 N/mm ² 	3.00	90	0.205	9550	1958	13.8
		4.00	90	0.240	7160	1718	21.6
		5.00	90	0.275	5730	1576	30.9
		6.00	90	0.310	4775	1480	41.8
		8.00	90	0.375	3580	1343	67.5
		9.00	90	0.405	3185	1290	82.1
		10.00	90	0.435	2865	1246	97.9
		12.00	90	0.495	2385	1181	133.6
		14.00	90	0.550	2045	1125	173.2
	Steel 850 - 1100 N/mm ² 	3.00	60	0.140	6365	891	6.3
		4.00	60	0.170	4775	812	10.2
		5.00	60	0.195	3820	745	14.6
		6.00	60	0.220	3185	701	19.8
		8.00	60	0.270	2385	644	32.4
		9.00	60	0.290	2120	615	39.1
		10.00	60	0.310	1910	592	46.5
		12.00	60	0.350	1590	557	63.0
		14.00	60	0.390	1365	532	81.9
	Steel 1100 - 1300 N/mm ² 	3.00	60	0.120	6365	764	5.4
		4.00	60	0.140	4775	669	8.4
		5.00	60	0.160	3820	611	12.0
		6.00	60	0.180	3185	573	16.2
		8.00	60	0.220	2385	525	26.4
		9.00	60	0.235	2120	498	31.7
		10.00	60	0.250	1910	478	37.5
		12.00	60	0.280	1590	445	50.3
		14.00	60	0.310	1365	423	65.1
	Cold work tool steel (12% Cr), high alloyed [1.2379] 	3.00	75	0.170	7960	1353	9.6
		4.00	75	0.200	5970	1194	15.0
		5.00	75	0.230	4775	1098	21.6
		6.00	75	0.265	3980	1055	29.8
		8.00	75	0.320	2985	955	48.0
		9.00	75	0.350	2655	929	59.1
		10.00	75	0.375	2385	894	70.2
		12.00	75	0.425	1990	846	95.7
		14.00	75	0.475	1705	810	124.7
	Cast iron (lamellar / spheroidal) 	3.00	120	0.220	12730	2801	19.8
		4.00	120	0.270	9550	2579	32.4
		5.00	120	0.320	7640	2445	48.0
		6.00	120	0.370	6365	2355	66.6
		8.00	120	0.465	4775	2220	111.6
		9.00	120	0.510	4245	2165	137.7
		10.00	120	0.555	3820	2120	166.5
		12.00	120	0.640	3185	2038	230.5
		14.00	120	0.720	2730	1966	302.6

25xd

**ReTool®**

Rm ≤ 850 HRC ≤ 24	Rm 850-1100 HRC 24-34	Rm 1100-1300 HRC 34-42							GG(G)
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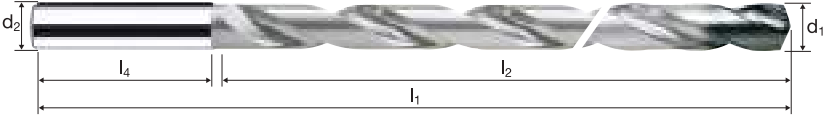
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Application	Material	d_1 [mm]	v_c [m/min]	f [mm]	n [min ⁻¹]	v_f [mm/min]	Q [cm ³ /min]
	Steel < 500 N/mm ² 	3.00	100	0.160	10610	1698	12.0
		4.00	100	0.190	7960	1512	19.0
		5.00	100	0.215	6365	1368	26.9
		6.00	100	0.245	5305	1300	36.8
		7.00	100	0.275	4545	1250	48.1
		8.00	100	0.300	3980	1194	60.0
		9.00	100	0.325	3535	1149	73.1
		10.00	100	0.350	3185	1115	87.6
		12.00	100	0.400	2655	1062	120.1
	Steel 500 - 850 N/mm ²	3.00	90	0.205	9550	1958	13.8
		4.00	90	0.240	7160	1718	21.6
		5.00	90	0.275	5730	1576	30.9
		6.00	90	0.310	4775	1480	41.8
		7.00	90	0.340	4095	1392	53.6
		8.00	90	0.375	3580	1343	67.5
		9.00	90	0.405	3185	1290	82.1
		10.00	90	0.435	2865	1246	97.9
		12.00	90	0.495	2385	1181	133.6
	Steel 850 - 1100 N/mm ²	3.00	60	0.140	6365	891	6.3
		4.00	60	0.170	4775	812	10.2
		5.00	60	0.195	3820	745	14.6
		6.00	60	0.220	3185	701	19.8
		7.00	60	0.245	2730	669	25.7
		8.00	60	0.270	2385	644	32.4
		9.00	60	0.290	2120	615	39.1
		10.00	60	0.310	1910	592	46.5
		12.00	60	0.350	1590	557	63.0
	Steel 1100 - 1300 N/mm ²	3.00	60	0.120	6365	764	5.4
		4.00	60	0.140	4775	669	8.4
		5.00	60	0.160	3820	611	12.0
		6.00	60	0.180	3185	573	16.2
		7.00	60	0.200	2730	546	21.0
		8.00	60	0.220	2385	525	26.4
		9.00	60	0.235	2120	498	31.7
		10.00	60	0.250	1910	478	37.5
		12.00	60	0.280	1590	445	50.3
	Cold work tool steel (12% Cr), high alloyed [1.2379]	3.00	75	0.170	7960	1353	9.6
		4.00	75	0.200	5970	1194	15.0
		5.00	75	0.230	4775	1098	21.6
		6.00	75	0.265	3980	1055	29.8
		7.00	75	0.290	3410	989	38.1
		8.00	75	0.320	2985	955	48.0
		9.00	75	0.350	2655	929	59.1
		10.00	75	0.375	2385	894	70.2
		12.00	75	0.425	1990	846	95.7
	Cast iron (lamellar / spheroidal)	3.00	120	0.220	12730	2801	19.8
		4.00	120	0.270	9550	2579	32.4
		5.00	120	0.320	7640	2445	48.0
		6.00	120	0.370	6365	2355	66.6
		7.00	120	0.420	5455	2291	88.2
		8.00	120	0.465	4775	2220	111.6
		9.00	120	0.510	4245	2165	137.7
		10.00	120	0.555	3820	2120	166.5
		12.00	120	0.640	3185	2038	230.5

Deep hole drills

30xd

HM
MGD²



ReTool®

Rm
<850
HRC
<24

Rm
850-1100
HRC
24-34

Rm
1100-1300
HRC
34-42

GG(G)

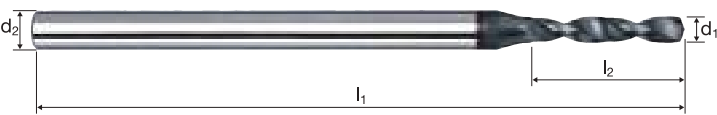
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							B52931	
Ø Code	d ₁ h7	d ₂ h6	l ₁	l ₂	l ₄	L _{max}		
0300	3.00	4.0	143.0	111.0	28	105.0	●	
0350	3.50	4.0	158.0	126.0	28	120.0	●	
0400	4.00	4.0	158.0	126.0	28	120.0	●	
0450	4.50	5.0	174.0	142.0	28	135.0	●	
0500	5.00	5.0	190.0	158.0	28	150.0	●	
0550	5.50	6.0	214.0	174.0	36	165.0	●	
0600	6.00	6.0	229.0	189.0	36	180.0	●	
0700	7.00	8.0	261.0	221.0	36	210.0	●	
0800	8.00	8.0	292.0	252.0	36	240.0	●	
0900	9.00	10.0	328.0	284.0	40	270.0	●	
1000	10.00	10.0	359.0	315.0	40	300.0	●	
1100	11.00	12.0	396.0	347.0	45	330.0	●	
1200	12.00	12.0	427.0	378.0	45	360.0	●	
See page «Technical notes regarding use of deep hole drills»								
A pilot hole is required!								

Application	Material	d_1 [mm]	v_c [m/min]	f [mm]	n [min ⁻¹]	v_f [mm/min]	Q [cm ³ /min]
	Steel < 500 N/mm ² 	0.20	100	0.0040	60000	240	7.5
		0.30	100	0.0060	60000	360	25.5
		0.40	100	0.0080	60000	480	60.5
		0.50	100	0.0100	60000	600	118.0
		0.60	100	0.0120	53050	637	180.0
		0.70	100	0.0140	45475	637	245.0
		0.80	100	0.0160	39790	637	320.0
		0.90	100	0.0180	35370	637	405.0
		1.00	100	0.0200	31830	637	500.0
	Steel 500 - 850 N/mm ² 	0.20	80	0.0040	60000	240	7.5
		0.30	80	0.0070	60000	420	29.5
		0.40	80	0.0090	60000	540	68.0
		0.50	80	0.0110	50930	560	110.0
		0.60	80	0.0130	42440	552	156.0
		0.70	80	0.0160	36380	582	224.0
		0.80	80	0.0180	31830	573	288.0
		0.90	80	0.0200	28295	566	360.0
		1.00	80	0.0220	25465	560	440.0
	Steel 850 - 1100 N/mm ² 	0.20	40	0.0030	60000	180	5.5
		0.30	40	0.0050	42440	212	15.0
		0.40	40	0.0060	31830	191	24.0
		0.50	40	0.0080	25465	204	40.0
		0.60	40	0.0090	21220	191	54.0
		0.70	40	0.0110	18190	200	77.0
		0.80	40	0.0120	15915	191	96.0
		0.90	40	0.0140	14145	198	126.0
		1.00	40	0.0150	12730	191	150.0
	Steel 1100 - 1300 N/mm ² 	0.20	50	0.0040	60000	240	7.5
		0.30	50	0.0050	53050	265	19.0
		0.40	50	0.0070	39790	279	35.0
		0.50	50	0.0090	31830	287	56.5
		0.60	50	0.0110	26525	292	82.5
		0.70	50	0.0130	22735	296	114.0
		0.80	35	0.0100	13925	139	70.0
		0.90	35	0.0110	12380	136	86.5
		1.00	35	0.0120	11140	134	105.0
	Stainless steel [Cr-Ni/1.4301] 	0.80	30	0.0120	11935	143	72.0
		0.90	30	0.0140	10610	149	94.5
		1.00	30	0.0150	9550	143	112.5
	Cast iron (lamellar / spheroidal) 	0.20	130	0.0040	60000	240	7.5
		0.30	130	0.0070	60000	420	29.5
		0.40	130	0.0090	60000	540	68.0
		0.50	130	0.0110	60000	660	129.5
		0.60	130	0.0130	60000	780	220.5
		0.70	130	0.0160	59115	946	364.0
		0.80	130	0.0180	51725	931	468.0
		0.90	130	0.0200	45980	920	585.0
		1.00	130	0.0220	41380	910	715.0
	Wrought aluminium alloys Si < 6% hardened 	0.20	160	0.0040	60000	240	7.5
		0.30	160	0.0070	60000	420	29.5
		0.40	160	0.0090	60000	540	68.0
		0.50	160	0.0110	60000	660	129.5
		0.60	160	0.0130	60000	780	220.5
		0.70	160	0.0160	60000	960	369.5
		0.80	160	0.0180	60000	1080	543.0
		0.90	160	0.0200	56590	1132	720.0
		1.00	160	0.0220	50930	1121	880.0

Micro drills Microdrill NX

5xd

HM
MG10



ReTool®

Rm
<850
HRC
<24

Rm
850-1100
HRC
24-34

Rm
1100-1300
HRC
34-42

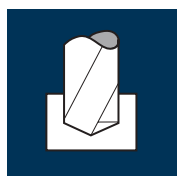
Inox
Stainless

GG(G)
Aluminium

							DURO-SD
Example: Order-Nº.							B57014
Article-Nº. 0020							
Ø Code	d ₁ m7	d ₂ h5	l ₁	l ₂	L _{max}		
0020	0.20	3.0	42.0	1.3	1.0		●
0025	0.25	3.0	42.0	1.6	1.2		●
0030	0.30	3.0	42.0	2.0	1.6		●
0035	0.35	3.0	42.0	2.3	1.8		●
0040	0.40	3.0	42.0	2.6	2.0		●
0045	0.45	3.0	42.0	2.9	2.2		●
0050	0.50	3.0	42.0	3.3	2.6		●
0055	0.55	3.0	42.0	3.6	2.8		●
0060	0.60	3.0	42.0	3.9	3.0		●
0065	0.65	3.0	42.0	4.2	3.2		●
0070	0.70	3.0	42.0	4.6	3.6		●
0075	0.75	3.0	42.0	4.9	3.8		●
0080	0.80	3.0	42.0	5.2	4.0		●
0085	0.85	3.0	42.0	5.5	4.2		●
0087	0.87	3.0	42.0	5.7	4.4		●
0090	0.90	3.0	42.0	5.9	4.6		●
0095	0.95	3.0	42.0	6.2	4.8		●
0100	1.00	3.0	42.0	6.5	5.0		●
0105	1.05	3.0	42.0	6.8	5.2		●
0107	1.07	3.0	42.0	7.0	5.4		●

Application

Material



Steel
< 500 N/mm²



Steel
500 - 850 N/mm²



Steel
850 - 1100 N/mm²



Steel
1100 - 1300 N/mm²



Stainless steel
[Cr-Ni/1.4301]



Cast iron
(lamellar / spheroidal)



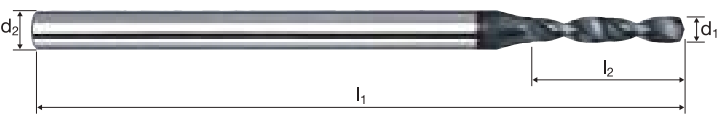
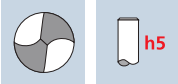
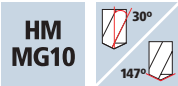
Wrought aluminium alloys
Si < 6%
hardened



d ₁ [mm]	v _c [m/min]	f [mm]	n [min ⁻¹]	v _f [mm/min]	Q [cm ³ /min]
1.10	100	0.0220	28935	637	0.6
1.20	100	0.0240	26525	637	0.7
1.30	100	0.0260	24485	637	0.8
1.40	100	0.0280	22735	637	1.0
1.50	100	0.0300	21220	637	1.1
1.60	100	0.0320	19895	637	1.3
1.70	100	0.0340	18725	637	1.4
1.80	100	0.0360	17685	637	1.6
1.90	100	0.0380	16755	637	1.8
1.10	80	0.0240	23150	556	0.5
1.20	80	0.0270	21220	573	0.6
1.30	80	0.0290	19590	568	0.8
1.40	80	0.0310	18190	564	0.9
1.50	80	0.0330	16975	560	1.0
1.60	80	0.0360	15915	573	1.2
1.70	80	0.0380	14980	569	1.3
1.80	80	0.0400	14145	566	1.4
1.90	80	0.0420	13405	563	1.6
1.10	40	0.0170	11575	197	0.2
1.20	40	0.0180	10610	191	0.2
1.30	40	0.0200	9795	196	0.3
1.40	40	0.0220	9095	200	0.3
1.50	40	0.0230	8490	195	0.3
1.60	40	0.0250	7960	199	0.4
1.70	40	0.0260	7490	195	0.4
1.80	40	0.0280	7075	198	0.5
1.90	40	0.0290	6700	194	0.6
1.10	35	0.0140	10130	142	0.1
1.20	35	0.0140	9285	130	0.1
1.30	35	0.0160	8570	137	0.2
1.40	35	0.0180	7960	143	0.2
1.50	35	0.0180	7425	134	0.2
1.60	35	0.0200	6965	139	0.3
1.70	35	0.0210	6555	138	0.3
1.80	35	0.0220	6190	136	0.3
1.90	35	0.0230	5865	135	0.4
1.10	30	0.0170	8680	148	0.1
1.20	30	0.0180	7960	143	0.2
1.30	30	0.0200	7345	147	0.2
1.40	30	0.0220	6820	150	0.2
1.50	30	0.0230	6365	146	0.3
1.60	30	0.0250	5970	149	0.3
1.70	30	0.0260	5615	146	0.3
1.80	30	0.0280	5305	149	0.4
1.90	30	0.0290	5025	146	0.4
1.10	130	0.0240	37620	903	0.9
1.20	130	0.0270	34485	931	1.1
1.30	130	0.0290	31830	923	1.2
1.40	130	0.0310	29555	916	1.4
1.50	130	0.0330	27585	910	1.6
1.60	130	0.0360	25865	931	1.9
1.70	130	0.0380	24340	925	2.1
1.80	130	0.0400	22990	920	2.3
1.90	130	0.0420	21780	915	2.6
1.10	160	0.0240	46300	1111	1.1
1.20	160	0.0270	42440	1146	1.3
1.30	160	0.0290	39175	1136	1.5
1.40	160	0.0310	36380	1128	1.7
1.50	160	0.0330	33955	1121	2.0
1.60	160	0.0360	31830	1146	2.3
1.70	160	0.0380	29960	1139	2.6
1.80	160	0.0400	28295	1132	2.9
1.90	160	0.0420	26805	1126	3.2

Micro drills Microdrill NX

5xd



ReTool®

Rm <850 HRC <24	Rm 850-1100 HRC 24-34	Rm 1100-1300 HRC 34-42					Inox Stainless		GG(G) Aluminium
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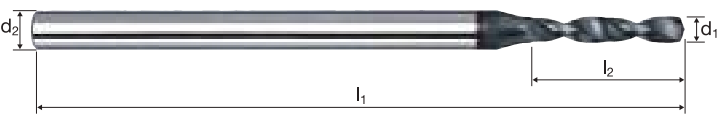
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Article-Nº. ø-Code							B57014	
B57014 0110								
Ø Code	d ₁ m7	d ₂ h5	l ₁	l ₂	L _{max}			
0110	1.10	3.0	42.0	7.2	5.6		●	
0115	1.15	3.0	42.0	7.5	5.8		●	
0120	1.20	3.0	42.0	7.8	6.0		●	
0125	1.25	3.0	42.0	8.1	6.2		●	
0130	1.30	3.0	42.0	8.5	6.6		●	
0135	1.35	3.0	42.0	8.8	6.8		●	
0140	1.40	3.0	42.0	9.1	7.0		●	
0142	1.42	3.0	42.0	9.2	7.1		●	
0145	1.45	3.0	42.0	9.4	7.2		●	
0150	1.50	3.0	42.0	9.8	7.6		●	
0155	1.55	3.0	42.0	10.1	7.8		●	
0160	1.60	3.0	42.0	10.4	8.0		●	
0162	1.62	3.0	42.0	10.5	8.1		●	
0165	1.65	3.0	42.0	10.7	8.2		●	
0170	1.70	3.0	42.0	11.1	8.6		●	
0175	1.75	3.0	42.0	11.4	8.8		●	
0180	1.80	3.0	42.0	11.7	9.0		●	
0185	1.85	3.0	50.0	12.0	9.2		●	
0190	1.90	3.0	50.0	12.4	9.6		●	
0195	1.95	3.0	50.0	12.7	9.8		●	

Application	Material	d_1 [mm]	v_c [m/min]	f [mm]	n [min ⁻¹]	v_f [mm/min]	Q [cm ³ /min]
	Steel < 500 N/mm ² 	2.00	100	0.0400	15915	637	2.0
		2.10	100	0.0420	15160	637	2.2
		2.20	100	0.0440	14470	637	2.4
		2.35	100	0.0470	13545	637	2.8
		2.50	100	0.0500	12730	637	3.1
		2.60	100	0.0520	12245	637	3.4
		2.75	100	0.0550	11575	637	3.8
		2.85	100	0.0570	11170	637	4.1
		2.95	100	0.0590	10790	637	4.4
	Steel 500 - 850 N/mm ² 	2.00	80	0.0440	12730	560	1.8
		2.10	80	0.0470	12125	570	2.0
		2.20	80	0.0490	11575	567	2.2
		2.35	80	0.0520	10835	563	2.4
		2.50	80	0.0560	10185	570	2.8
		2.60	80	0.0580	9795	568	3.0
		2.75	80	0.0610	9260	565	3.4
		2.85	80	0.0630	8935	563	3.6
		2.95	80	0.0660	8630	570	3.9
	Steel 850 - 1100 N/mm ² 	2.00	40	0.0310	6365	197	0.6
		2.10	40	0.0320	6065	194	0.7
		2.20	40	0.0340	5785	197	0.7
		2.35	40	0.0360	5420	195	0.8
		2.50	40	0.0380	5095	194	1.0
		2.60	40	0.0400	4895	196	1.0
		2.75	40	0.0420	4630	195	1.2
		2.85	40	0.0440	4470	197	1.3
		2.95	40	0.0450	4315	194	1.3
	Steel 1100 - 1300 N/mm ² 	2.00	35	0.0250	5570	139	0.4
		2.10	35	0.0260	5305	138	0.5
		2.20	35	0.0270	5065	137	0.5
		2.35	35	0.0290	4740	138	0.6
		2.50	35	0.0300	4455	134	0.7
		2.60	35	0.0320	4285	137	0.7
		2.75	35	0.0340	4050	138	0.8
		2.85	35	0.0350	3910	137	0.9
		2.95	35	0.0360	3775	136	0.9
	Stainless steel [Cr-Ni/1.4301] 	2.00	30	0.0310	4775	148	0.5
		2.10	30	0.0320	4545	145	0.5
		2.20	30	0.0340	4340	148	0.6
		2.35	30	0.0360	4065	146	0.6
		2.50	30	0.0380	3820	145	0.7
		2.60	30	0.0400	3675	147	0.8
		2.75	30	0.0420	3470	146	0.9
		2.85	30	0.0440	3350	147	0.9
		2.95	30	0.0450	3235	146	1.0
	Cast iron (lamellar / spheroidal) 	2.00	130	0.0440	20690	910	2.9
		2.10	130	0.0470	19705	926	3.2
		2.20	130	0.0490	18810	922	3.5
		2.35	130	0.0520	17610	916	4.0
		2.50	130	0.0560	16550	927	4.5
		2.60	130	0.0580	15915	923	4.9
		2.75	130	0.0610	15045	918	5.5
		2.85	130	0.0630	14520	915	5.8
		2.95	130	0.0660	14025	926	6.3
	Wrought aluminium alloys Si < 6% hardened 	2.00	160	0.0440	25465	1121	3.5
		2.10	160	0.0470	24250	1140	3.9
		2.20	160	0.0490	23150	1134	4.3
		2.35	160	0.0520	21670	1127	4.9
		2.50	160	0.0560	20370	1141	5.6
		2.60	160	0.0580	19590	1136	6.0
		2.75	160	0.0610	18520	1130	6.7
		2.85	160	0.0630	17870	1126	7.2
		2.95	160	0.0660	17265	1140	7.8

Micro drills Microdrill NX

5xd

HM
MG10



ReTool®

Rm
<850
HRC
<24

Rm
850-1100
HRC
24-34

Rm
1100-1300
HRC
34-42

Inox
Stainless

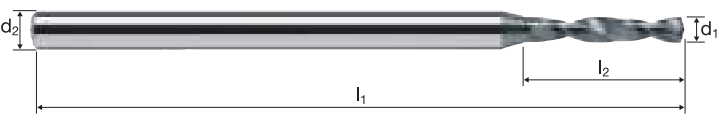
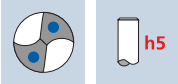
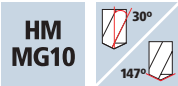
GG(G)
Aluminium

Example: Order-Nº.							DURO-SD	
Article-Nº. B57014 ø-Code 0200							B57014	
Ø Code	d ₁ m7	d ₂ h5	l ₁	l ₂	L _{max}			
0200	2.00	3.0	50.0	13.0	10.0			●
0205	2.05	3.0	50.0	13.3	10.2			●
0210	2.10	3.0	50.0	13.7	10.6			●
0215	2.15	3.0	50.0	14.0	10.8			●
0220	2.20	3.0	50.0	14.3	11.0			●
0225	2.25	3.0	50.0	14.6	11.2			●
0230	2.30	3.0	50.0	15.0	11.6			●
0235	2.35	3.0	50.0	15.3	11.8			●
0240	2.40	3.0	50.0	15.6	12.0			●
0245	2.45	3.0	50.0	15.9	12.2			●
0250	2.50	3.0	50.0	16.3	12.6			●
0255	2.55	3.0	50.0	16.6	12.8			●
0260	2.60	3.0	50.0	16.9	13.0			●
0265	2.65	3.0	50.0	17.2	13.2			●
0270	2.70	3.0	50.0	17.6	13.6			●
0275	2.75	3.0	50.0	17.9	13.8			●
0280	2.80	3.0	50.0	18.2	14.0			●
0285	2.85	3.0	50.0	18.5	14.2			●
0290	2.90	3.0	50.0	18.9	14.6			●
0295	2.95	3.0	50.0	19.2	14.8			●

Application	Material	d_1 [mm]	v_c [m/min]	f [mm]	n [min ⁻¹]	v_f [mm/min]	Q [cm ³ /min]
	Steel < 500 N/mm ² 	0.80	160	0.0180	60000	1080	0.5
		0.90	160	0.0200	56590	1132	0.7
		1.00	160	0.0220	50930	1121	0.9
		1.10	160	0.0240	46300	1111	1.1
		1.25	160	0.0280	40745	1141	1.4
		1.40	160	0.0320	36380	1164	1.8
		1.50	160	0.0340	33955	1155	2.0
		1.65	160	0.0390	30865	1204	2.6
		1.80	160	0.0440	28295	1245	3.2
	Steel 500 - 850 N/mm ² 	0.80	120	0.0180	47745	859	0.4
		0.90	120	0.0200	42440	849	0.5
		1.00	120	0.0220	38195	840	0.7
		1.10	120	0.0240	34725	833	0.8
		1.25	120	0.0280	30560	856	1.1
		1.40	120	0.0320	27285	873	1.3
		1.50	120	0.0340	25465	866	1.5
		1.65	120	0.0390	23150	903	1.9
		1.80	120	0.0440	21220	934	2.4
	Steel 850 - 1100 N/mm ² 	0.80	100	0.0180	39790	716	0.4
		0.90	100	0.0200	35370	707	0.5
		1.00	100	0.0220	31830	700	0.6
		1.10	100	0.0240	28935	694	0.7
		1.25	100	0.0280	25465	713	0.9
		1.40	100	0.0320	22735	728	1.1
		1.50	100	0.0340	21220	722	1.3
		1.65	100	0.0390	19290	752	1.6
		1.80	100	0.0440	17685	778	2.0
	Stainless steel [Cr-Ni-Mo-.../1.4571] 	0.80	70	0.0140	27850	390	0.2
		0.90	70	0.0160	24755	396	0.3
		1.00	70	0.0180	22280	401	0.3
		1.10	70	0.0200	20255	405	0.4
		1.25	70	0.0230	17825	410	0.5
		1.40	70	0.0260	15915	414	0.6
		1.50	70	0.0290	14855	431	0.8
		1.65	70	0.0320	13505	432	0.9
		1.80	70	0.0360	12380	446	1.1
	Cast iron (lamellar / spheroidal) 	0.80	200	0.0210	60000	1260	0.6
		0.90	200	0.0230	60000	1380	0.9
		1.00	200	0.0260	60000	1560	1.2
		1.10	200	0.0280	57875	1621	1.5
		1.25	200	0.0330	50930	1681	2.1
		1.40	200	0.0370	45475	1683	2.6
		1.50	200	0.0410	42440	1740	3.1
		1.65	200	0.0450	38585	1736	3.7
		1.80	200	0.0500	35370	1769	4.5
	Wrought aluminium alloys Si < 6% hardened 	0.80	250	0.0210	60000	1260	0.6
		0.90	250	0.0230	60000	1380	0.9
		1.00	250	0.0260	60000	1560	1.2
		1.10	250	0.0280	60000	1680	1.6
		1.25	250	0.0330	60000	1980	2.4
		1.40	250	0.0370	56840	2103	3.2
		1.50	250	0.0410	53050	2175	3.8
		1.65	250	0.0450	48230	2170	4.6
		1.80	250	0.0500	44210	2211	5.6

Micro drills Microdrill NX

5xd



ReTool®

Rm <850 HRC <24	Rm 850-1100 HRC 24-34	Rm 1100-1300 HRC 34-42					Inox Stainless		GG(G) Aluminium
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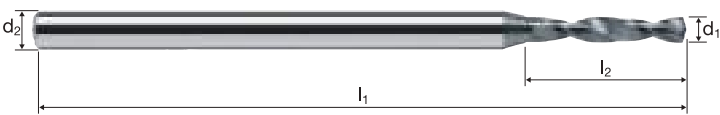
Example: Order-Nº. B57015 0080								DURO-SD
								B57015
Ø Code	d ₁ m7	d ₂ h5	l ₁	l ₂	L _{max}			
0080	0.80	3.0	46.0	5.2	4.0			●
0085	0.85	3.0	46.0	5.5	4.2			●
0090	0.90	3.0	46.0	5.9	4.6			●
0095	0.95	3.0	46.0	6.2	4.8			●
0100	1.00	3.0	48.0	6.5	5.0			●
0105	1.05	3.0	48.0	6.8	5.2			●
0110	1.10	3.0	48.0	7.2	5.6			●
0115	1.15	3.0	48.0	7.5	5.8			●
0120	1.20	3.0	48.0	7.8	6.0			●
0125	1.25	3.0	48.0	8.1	6.2			●
0130	1.30	3.0	48.0	8.5	6.6			●
0135	1.35	3.0	48.0	8.8	6.8			●
0140	1.40	3.0	50.0	9.1	7.0			●
0145	1.45	3.0	50.0	9.4	7.2			●
0150	1.50	3.0	50.0	9.8	7.6			●
0155	1.55	3.0	50.0	10.1	7.8			●
0160	1.60	3.0	50.0	10.4	8.0			●
0165	1.65	3.0	50.0	10.7	8.2			●
0170	1.70	3.0	52.0	11.1	8.6			●
0175	1.75	3.0	52.0	11.4	8.8			●
0180	1.80	3.0	52.0	11.7	9.0			●
0185	1.85	3.0	52.0	12.0	9.2			●

Application	Material	d_1 [mm]	v_c [m/min]	f [mm]	n [min ⁻¹]	v_f [mm/min]	Q [cm ³ /min]
	Steel < 500 N/mm ² 	2.00	160	0.0490	25465	1248	3.9
		2.10	160	0.0510	24250	1237	4.3
		2.20	160	0.0540	23150	1250	4.8
		2.35	160	0.0590	21670	1279	5.5
		2.50	160	0.0640	20370	1304	6.4
		2.60	160	0.0670	19590	1313	7.0
		2.75	160	0.0720	18520	1333	7.9
		2.85	160	0.0750	17870	1340	8.6
		2.95	160	0.0800	17265	1381	9.4
		2.00	120	0.0490	19100	936	2.9
	Steel 500 - 850 N/mm ²	2.10	120	0.0510	18190	928	3.2
		2.20	120	0.0540	17360	937	3.6
		2.35	120	0.0590	16255	959	4.2
		2.50	120	0.0640	15280	978	4.8
		2.60	120	0.0670	14690	984	5.2
		2.75	120	0.0720	13890	1000	5.9
		2.85	120	0.0750	13405	1005	6.4
		2.95	120	0.0800	12950	1036	7.1
		2.00	100	0.0490	15915	780	2.4
		2.10	100	0.0510	15160	773	2.7
	Steel 850 - 1100 N/mm ²	2.20	100	0.0540	14470	781	3.0
		2.35	100	0.0590	13545	799	3.5
		2.50	100	0.0640	12730	815	4.0
		2.60	100	0.0670	12245	820	4.4
		2.75	100	0.0720	11575	833	5.0
		2.85	100	0.0750	11170	838	5.3
		2.95	100	0.0800	10790	863	5.9
		2.00	70	0.0450	11140	501	1.6
		2.10	70	0.0480	10610	509	1.8
		2.20	70	0.0500	10130	507	1.9
	Stainless steel [Cr-Ni-Mo-.../1.4571]	2.35	70	0.0550	9480	521	2.3
		2.50	70	0.0580	8915	517	2.5
		2.60	70	0.0620	8570	531	2.8
		2.75	70	0.0670	8100	543	3.2
		2.85	70	0.0710	7820	555	3.5
		2.95	70	0.0740	7555	559	3.8
		2.00	200	0.0570	31830	1814	5.7
		2.10	200	0.0600	30315	1819	6.3
		2.20	200	0.0630	28935	1823	6.9
		2.35	200	0.0690	27090	1869	8.1
	Cast iron (lamellar / spheroidal)	2.50	200	0.0740	25465	1884	9.3
		2.60	200	0.0790	24485	1934	10.3
		2.75	200	0.0830	23150	1922	11.4
		2.85	200	0.0860	22340	1921	12.3
		2.95	200	0.0890	21580	1921	13.1
		2.00	250	0.0570	39790	2268	7.1
		2.10	250	0.0600	37895	2274	7.9
		2.20	250	0.0630	36170	2279	8.7
		2.35	250	0.0690	33865	2337	10.1
		2.50	250	0.0740	31830	2355	11.6
	Wrought aluminium alloys Si < 6% hardened	2.60	250	0.0790	30605	2418	12.8
		2.75	250	0.0830	28935	2402	14.3
		2.85	250	0.0860	27920	2401	15.3
		2.95	250	0.0890	26975	2401	16.4

Micro drills Microdrill NX

5xd

HM
MG10



ReTool®

Rm
<850
HRC
<24

Rm
850-1100
HRC
24-34

Rm
1100-1300
HRC
34-42

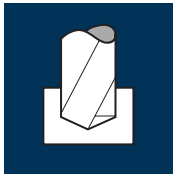
Inox
Stainless

GG(G)
Aluminium

Example: Order-Nº.							DURO-SD	
Article-Nº. ø-Code							B57015	
B57015 0190								
Ø Code	d ₁ m7	d ₂ h5	l ₁	l ₂	L _{max}			
0190	1.90	3.0	52.0	12.4	9.6		●	
0195	1.95	3.0	52.0	12.7	9.8		●	
0200	2.00	3.0	56.0	13.0	10.0		●	
0205	2.05	3.0	56.0	13.3	10.2		●	
0210	2.10	3.0	56.0	13.7	10.6		●	
0215	2.15	3.0	56.0	14.0	10.8		●	
0220	2.20	3.0	56.0	14.3	11.0		●	
0225	2.25	3.0	56.0	14.6	11.2		●	
0230	2.30	3.0	56.0	15.0	11.6		●	
0235	2.35	3.0	56.0	15.3	11.8		●	
0240	2.40	3.0	56.0	15.6	12.0		●	
0245	2.45	3.0	56.0	15.9	12.2		●	
0250	2.50	3.0	56.0	16.3	12.6		●	
0255	2.55	3.0	60.0	16.6	12.8		●	
0260	2.60	3.0	60.0	16.9	13.0		●	
0265	2.65	3.0	60.0	17.2	13.2		●	
0270	2.70	3.0	60.0	17.6	13.6		●	
0275	2.75	3.0	60.0	17.9	13.8		●	
0280	2.80	3.0	60.0	18.2	14.0		●	
0285	2.85	3.0	60.0	18.5	14.2		●	
0290	2.90	3.0	60.0	18.9	14.6		●	
0295	2.95	3.0	60.0	19.2	14.8		●	

Application

Material



Steel
< 500 N/mm²



Steel
500 - 850 N/mm²



Steel
850 - 1100 N/mm²



Stainless steel
[Cr-Ni-Mo-.../1.4571]



Cast iron
(lamellar / spheroidal)



Wrought aluminium alloys
Si < 6%
hardened



d ₁ [mm]	v _c [m/min]	f [mm]	n [min ⁻¹]	v _f [mm/min]	Q [cm ³ /min]
0.80	140	0.0140	55705	780	0.4
0.90	140	0.0160	49515	792	0.5
1.00	140	0.0180	44565	802	0.6
1.10	140	0.0190	40510	770	0.7
1.25	140	0.0230	35650	820	1.0
1.40	140	0.0260	31830	828	1.3
1.50	140	0.0280	29710	832	1.5
1.65	140	0.0320	27010	864	1.8
1.80	140	0.0350	24755	866	2.2
0.80	100	0.0140	39790	557	0.3
0.90	100	0.0160	35370	566	0.4
1.00	100	0.0180	31830	573	0.4
1.10	100	0.0190	28935	550	0.5
1.25	100	0.0230	25465	586	0.7
1.40	100	0.0260	22735	591	0.9
1.50	100	0.0280	21220	594	1.1
1.65	100	0.0320	19290	617	1.3
1.80	100	0.0350	17685	619	1.6
0.80	80	0.0140	31830	446	0.2
0.90	80	0.0160	28295	453	0.3
1.00	80	0.0180	25465	458	0.4
1.10	80	0.0190	23150	440	0.4
1.25	80	0.0230	20370	469	0.6
1.40	80	0.0260	18190	473	0.7
1.50	80	0.0280	16975	475	0.8
1.65	80	0.0320	15435	494	1.1
1.80	80	0.0350	14145	495	1.3
0.80	60	0.0120	23875	287	0.1
0.90	60	0.0130	21220	276	0.2
1.00	60	0.0140	19100	267	0.2
1.10	60	0.0160	17360	278	0.3
1.25	60	0.0180	15280	275	0.3
1.40	60	0.0210	13640	286	0.4
1.50	60	0.0230	12730	293	0.5
1.65	60	0.0260	11575	301	0.6
1.80	60	0.0290	10610	308	0.8
0.80	150	0.0160	59685	955	0.5
0.90	150	0.0190	53050	1008	0.6
1.00	150	0.0210	47745	1003	0.8
1.10	150	0.0230	43405	998	0.9
1.25	150	0.0260	38195	993	1.2
1.40	150	0.0300	34105	1023	1.6
1.50	150	0.0320	31830	1019	1.8
1.65	150	0.0360	28935	1042	2.2
1.80	150	0.0400	26525	1061	2.7
0.80	200	0.0160	60000	960	0.5
0.90	200	0.0190	60000	1140	0.7
1.00	200	0.0210	60000	1260	1.0
1.10	200	0.0230	57875	1331	1.3
1.25	200	0.0260	50930	1324	1.6
1.40	200	0.0300	45475	1364	2.1
1.50	200	0.0320	42440	1358	2.4
1.65	200	0.0360	38585	1389	3.0
1.80	200	0.0400	35370	1415	3.6

Micro drills Microdrill NX

8xd

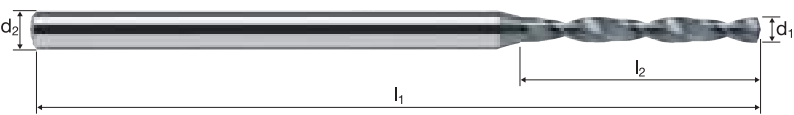
HM
MG10





h5





ReTool®

Rm
<850
HRC
<24

Rm
850-1100
HRC
24-34

Rm
1100-1300
HRC
34-42

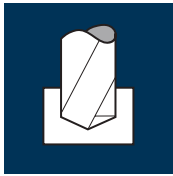
Inox
Stainless

GG(G)
Aluminium

Example: Order-N°.						DURO-SD	
Article-N°.						B57020	
ø-Code							
Ø Code	d ₁ m7	d ₂ h5	l ₁	l ₂	L _{max}		
0080	0.80	3.0	46.0	7.6	6.4		●
0085	0.85	3.0	46.0	8.1	6.8		●
0090	0.90	3.0	46.0	8.5	7.2		●
0095	0.95	3.0	46.0	9.0	7.6		●
0100	1.00	3.0	48.0	9.5	8.0		●
0105	1.05	3.0	48.0	10.0	8.4		●
0110	1.10	3.0	48.0	10.4	8.8		●
0115	1.15	3.0	48.0	10.9	9.2		●
0120	1.20	3.0	48.0	11.4	9.6		●
0125	1.25	3.0	48.0	11.9	10.0		●
0130	1.30	3.0	48.0	12.3	10.4		●
0135	1.35	3.0	48.0	12.8	10.8		●
0140	1.40	3.0	50.0	13.3	11.2		●
0145	1.45	3.0	50.0	13.8	11.6		●
0150	1.50	3.0	50.0	14.2	12.0		●
0155	1.55	3.0	50.0	14.7	12.4		●
0160	1.60	3.0	50.0	15.2	12.8		●
0165	1.65	3.0	50.0	15.7	13.2		●
0170	1.70	3.0	52.0	16.1	13.6		●
0175	1.75	3.0	52.0	16.6	14.0		●
0180	1.80	3.0	52.0	17.1	14.4		●
0185	1.85	3.0	52.0	17.6	14.8		●

Application

Material



Steel
< 500 N/mm²



Steel
500 - 850 N/mm²



Steel
850 - 1100 N/mm²



Stainless steel
[Cr-Ni-Mo-.../1.4571]



Cast iron
(lamellar / spheroidal)



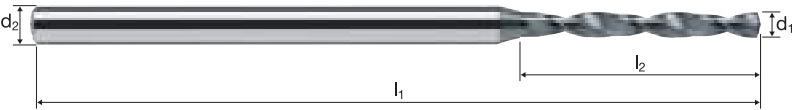
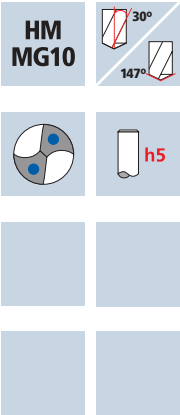
Wrought aluminium alloys
Si < 6%
hardened



d ₁ [mm]	v _c [m/min]	f [mm]	n [min ⁻¹]	v _f [mm/min]	Q [cm ³ /min]
2.00	140	0.0390	22280	869	2.7
2.10	140	0.0410	21220	870	3.0
2.20	140	0.0430	20255	871	3.3
2.35	140	0.0470	18965	891	3.9
2.50	140	0.0510	17825	909	4.5
2.60	140	0.0530	17140	908	4.8
2.75	140	0.0580	16205	940	5.6
2.85	140	0.0600	15635	938	6.0
2.95	140	0.0640	15105	967	6.6
2.00	100	0.0390	15915	621	2.0
2.10	100	0.0410	15160	622	2.2
2.20	100	0.0430	14470	622	2.4
2.35	100	0.0470	13545	637	2.8
2.50	100	0.0510	12730	649	3.2
2.60	100	0.0530	12245	649	3.4
2.75	100	0.0580	11575	671	4.0
2.85	100	0.0600	11170	670	4.3
2.95	100	0.0640	10790	691	4.7
2.00	80	0.0390	12730	497	1.6
2.10	80	0.0410	12125	497	1.7
2.20	80	0.0430	11575	498	1.9
2.35	80	0.0470	10835	509	2.2
2.50	80	0.0510	10185	519	2.5
2.60	80	0.0530	9795	519	2.8
2.75	80	0.0580	9260	537	3.2
2.85	80	0.0600	8935	536	3.4
2.95	80	0.0640	8630	552	3.8
2.00	60	0.0360	9550	344	1.1
2.10	60	0.0380	9095	346	1.2
2.20	60	0.0400	8680	347	1.3
2.35	60	0.0440	8125	358	1.6
2.50	60	0.0470	7640	359	1.8
2.60	60	0.0500	7345	367	2.0
2.75	60	0.0540	6945	375	2.2
2.85	60	0.0570	6700	382	2.4
2.95	60	0.0590	6475	382	2.6
2.00	150	0.0460	23875	1098	3.5
2.10	150	0.0480	22735	1091	3.8
2.20	150	0.0500	21705	1085	4.1
2.35	150	0.0550	20320	1118	4.8
2.50	150	0.0590	19100	1127	5.5
2.60	150	0.0630	18365	1157	6.1
2.75	150	0.0670	17360	1163	6.9
2.85	150	0.0690	16755	1156	7.4
2.95	150	0.0720	16185	1165	8.0
2.00	200	0.0460	31830	1464	4.6
2.10	200	0.0480	30315	1455	5.0
2.20	200	0.0500	28935	1447	5.5
2.35	200	0.0550	27090	1490	6.5
2.50	200	0.0590	25465	1502	7.4
2.60	200	0.0630	24485	1543	8.2
2.75	200	0.0670	23150	1551	9.2
2.85	200	0.0690	22340	1542	9.8
2.95	200	0.0720	21580	1554	10.6

Micro drills Microdrill NX

8xd

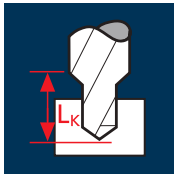


ReTool®

Rm <850 HRC <24	Rm 850-1100 HRC 24-34	Rm 1100-1300 HRC 34-42					Inox Stainless		GG(G) Aluminium
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Example: Order-Nº.							DURO-SD	
Article-Nº. ø-Code							B57020	
Ø Code								
d1 m7		d2 h5	l1 l2		Lmax			
0190	1.90	3.0	52.0	18.0	15.2		●	
0195	1.95	3.0	52.0	18.5	15.6		●	
0200	2.00	3.0	56.0	19.0	16.0		●	
0205	2.05	3.0	56.0	19.5	16.4		●	
0210	2.10	3.0	56.0	20.0	16.9		●	
0215	2.15	3.0	56.0	20.4	17.2		●	
0220	2.20	3.0	56.0	20.9	17.6		●	
0225	2.25	3.0	56.0	21.4	18.0		●	
0230	2.30	3.0	56.0	21.9	18.5		●	
0235	2.35	3.0	56.0	22.3	18.8		●	
0240	2.40	3.0	56.0	22.8	19.2		●	
0245	2.45	3.0	56.0	23.3	19.6		●	
0250	2.50	3.0	56.0	23.8	20.1		●	
0255	2.55	3.0	60.0	24.2	20.4		●	
0260	2.60	3.0	60.0	24.7	20.8		●	
0265	2.65	3.0	60.0	25.2	21.2		●	
0270	2.70	3.0	60.0	25.7	21.7		●	
0275	2.75	3.0	60.0	26.1	22.0		●	
0280	2.80	3.0	60.0	26.6	22.4		●	
0285	2.85	3.0	60.0	27.1	22.8		●	
0290	2.90	3.0	60.0	27.6	23.3		●	
0295	2.95	3.0	60.0	28.0	23.6		●	

Application



Material

Steel
< 500 N/mm²



Steel
500 - 850 N/mm²



Steel
850 - 1100 N/mm²



Cast iron
(lamellar / spheroidal)

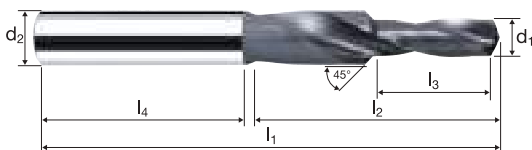
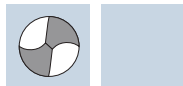


Wrought aluminium alloys
Si < 6%
hardened



d ₁ [mm]	d	v _c [m/min]	f [mm]	LK [mm]	n [min ⁻¹]	v _f [mm/min]	Q [cm ³ /min]
2.50	M 3	110	0.0450	9.6	14005	630	3.1
3.30	M 4	110	0.0550	12.5	10610	584	5.0
4.20	M 5	110	0.0700	14.9	8335	584	8.1
5.00	M 6	110	0.0850	18.1	7005	595	11.7
6.80	M 8	110	0.1150	23.0	5150	592	21.5
8.50	M 10	110	0.1450	28.0	4120	597	33.9
10.20	M 12	110	0.1700	33.1	3435	584	47.7
14.00	M 16	110	0.2300	42.4	2500	575	88.5
2.50	M 3	80	0.0450	9.6	10185	458	2.2
3.30	M 4	80	0.0550	12.5	7715	424	3.6
4.20	M 5	80	0.0700	14.9	6065	425	5.9
5.00	M 6	80	0.0850	18.1	5095	433	8.5
6.80	M 8	80	0.1150	23.0	3745	431	15.6
8.50	M 10	80	0.1450	28.0	2995	434	24.6
10.20	M 12	80	0.1700	33.1	2495	424	34.7
14.00	M 16	80	0.2300	42.4	1820	419	64.4
2.50	M 3	55	0.0400	9.6	7005	280	1.4
3.30	M 4	55	0.0500	12.5	5305	265	2.3
4.20	M 5	55	0.0650	14.9	4170	271	3.8
5.00	M 6	55	0.0750	18.1	3500	263	5.2
6.80	M 8	55	0.1000	23.0	2575	258	9.4
8.50	M 10	55	0.1250	28.0	2060	258	14.6
10.20	M 12	55	0.1500	33.1	1715	257	21.0
14.00	M 16	55	0.2000	42.4	1250	250	38.5
2.50	M 3	160	0.0800	9.6	20370	1630	8.0
3.30	M 4	160	0.1050	12.5	15435	1621	13.9
4.20	M 5	160	0.1300	14.9	12125	1576	21.8
5.00	M 6	160	0.1600	18.1	10185	1630	32.0
6.80	M 8	160	0.2100	23.0	7490	1573	57.1
8.50	M 10	160	0.2650	28.0	5990	1587	90.1
10.20	M 12	160	0.3150	33.1	4995	1573	128.6
14.00	M 16	160	0.4200	42.4	3640	1529	235.3
2.50	M 3	200	0.0800	9.6	25465	2037	10.0
3.30	M 4	200	0.1050	12.5	19290	2026	17.3
4.20	M 5	200	0.1300	14.9	15160	1971	27.3
5.00	M 6	200	0.1600	18.1	12730	2037	40.0
6.80	M 8	200	0.2100	23.0	9360	1966	71.4
8.50	M 10	200	0.2650	28.0	7490	1985	112.6
10.20	M 12	200	0.3150	33.1	6240	1966	160.6
14.00	M 16	200	0.4200	42.4	4545	1909	293.9

3xd, for core drill sizes for taps



ReTool®

Rm ≤ 850 HRC ≤ 24	Rm 850-1100 HRC 24-34	Rm 1100-1300 HRC 34-42							GG(G) Aluminium
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[illegible]

Application	Material	d_1 [mm]	v_c [m/min]	f [mm]	n [min ⁻¹]	v_f [mm/min]
	Steel < 500 N/mm ² 	3.00	160	0.0700	16975	1188
		4.00	160	0.0950	12730	1209
		5.00	160	0.1200	10185	1222
		6.00	160	0.1450	8490	1231
		8.00	160	0.1900	6365	1209
		10.00	160	0.2400	5095	1223
		12.00	160	0.2850	4245	1210
		16.00	160	0.3800	3185	1210
	Steel 500 - 850 N/mm ² 	3.00	120	0.0700	12730	891
		4.00	120	0.0950	9550	907
		5.00	120	0.1200	7640	917
		6.00	120	0.1450	6365	923
		8.00	120	0.1900	4775	907
		10.00	120	0.2400	3820	917
		12.00	120	0.2850	3185	908
		16.00	120	0.3800	2385	906
	Steel 850 - 1100 N/mm ² 	3.00	90	0.0300	9550	287
		4.00	90	0.0400	7160	286
		5.00	90	0.0500	5730	287
		6.00	90	0.0600	4775	287
		8.00	90	0.0800	3580	286
		10.00	90	0.0950	2865	272
		12.00	90	0.1150	2385	274
		16.00	90	0.1550	1790	278
	Steel 1100 - 1300 N/mm ² 	3.00	60	0.0250	6365	159
		4.00	60	0.0350	4775	167
		5.00	60	0.0400	3820	153
		6.00	60	0.0500	3185	159
		8.00	60	0.0650	2385	155
		10.00	60	0.0800	1910	153
		12.00	60	0.0950	1590	151
		16.00	60	0.1300	1195	155
	Steel 1300 - 1500 N/mm ² 	3.00	30	0.0250	3185	80
		4.00	30	0.0350	2385	84
		5.00	30	0.0400	1910	76
		6.00	30	0.0500	1590	80
		8.00	30	0.0650	1195	78
		10.00	30	0.0800	955	76
		12.00	30	0.0950	795	76
		16.00	30	0.1300	595	77
	Stainless steel [Cr-Ni/1.4301] 	3.00	60	0.0150	6365	96
		4.00	60	0.0200	4775	96
		5.00	60	0.0250	3820	96
		6.00	60	0.0300	3185	96
		8.00	60	0.0400	2385	95
		10.00	60	0.0450	1910	86
		12.00	60	0.0600	1590	95
		16.00	60	0.0750	1195	90
	Cast iron (lamellar / spheroidal)  	3.00	180	0.0800	19100	1528
		4.00	180	0.1050	14325	1504
		5.00	180	0.1300	11460	1490
		6.00	180	0.1600	9550	1528
		8.00	180	0.2100	7160	1504
		10.00	180	0.2650	5730	1519
		12.00	180	0.3150	4775	1504
		16.00	180	0.4200	3580	1504
	Wrought aluminium alloys Si < 6% hardened 	3.00	220	0.0800	23345	1868
		4.00	220	0.1050	17505	1838
		5.00	220	0.1300	14005	1821
		6.00	220	0.1600	11670	1867
		8.00	220	0.2100	8755	1839
		10.00	220	0.2650	7005	1856
		12.00	220	0.3150	5835	1838
		16.00	220	0.4200	4375	1838

Center drills

90°

HM	
MG10	



ReTool®

Rm <850 HRC <24	Rm 850-1100 HRC 24-34	Rm 1100-1300 HRC 34-42					Inox Stainless		GG(G) Aluminium
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Example: Order-N°.				Article-N°.		ø-Code				POLYCHROM	
				B92040		0300				B92040	
Ø Code	d ₁ h ₆	d ₂ h ₆	l ₁								
0300	3.00	3.0	50.0								●
0400	4.00	4.0	50.0								●
0500	5.00	5.0	50.0								●
0600	6.00	6.0	57.0								●
0800	8.00	8.0	63.0								●
1000	10.00	10.0	72.0								●
1200	12.00	12.0	83.0								●
1600	16.00	16.0	92.0								●

Application	Material	d_1 [mm]	v_c [m/min]	f [mm]	n [min ⁻¹]	v_f [mm/min]
	Steel < 500 N/mm ² 	3.00	160	0.0700	16975	1188
		4.00	160	0.0950	12730	1209
		5.00	160	0.1200	10185	1222
		6.00	160	0.1450	8490	1231
		8.00	160	0.1900	6365	1209
		10.00	160	0.2400	5095	1223
		12.00	160	0.2850	4245	1210
		16.00	160	0.3800	3185	1210
	Steel 500 - 850 N/mm ² 	3.00	120	0.0700	12730	891
		4.00	120	0.0950	9550	907
		5.00	120	0.1200	7640	917
		6.00	120	0.1450	6365	923
		8.00	120	0.1900	4775	907
		10.00	120	0.2400	3820	917
		12.00	120	0.2850	3185	908
		16.00	120	0.3800	2385	906
	Steel 850 - 1100 N/mm ² 	3.00	90	0.0600	9550	573
		4.00	90	0.0750	7160	537
		5.00	90	0.0950	5730	544
		6.00	90	0.1150	4775	549
		8.00	90	0.1550	3580	555
		10.00	90	0.1900	2865	544
		12.00	90	0.2300	2385	549
		16.00	90	0.3100	1790	555
	Steel 1100 - 1300 N/mm ² 	3.00	60	0.0500	6365	318
		4.00	60	0.0650	4775	310
		5.00	60	0.0800	3820	306
		6.00	60	0.0950	3185	303
		8.00	60	0.1250	2385	298
		10.00	60	0.1600	1910	306
		12.00	60	0.1900	1590	302
		16.00	60	0.2550	1195	305
	Steel 1300 - 1500 N/mm ² 	3.00	30	0.0500	3185	159
		4.00	30	0.0650	2385	155
		5.00	30	0.0800	1910	153
		6.00	30	0.0950	1590	151
		8.00	30	0.1250	1195	149
		10.00	30	0.1600	955	153
		12.00	30	0.1900	795	151
		16.00	30	0.2550	595	152
	Stainless steel [Cr-Ni/1.4301] 	3.00	60	0.0400	6365	255
		4.00	60	0.0550	4775	263
		5.00	60	0.0700	3820	267
		6.00	60	0.0800	3185	255
		8.00	60	0.1100	2385	262
		10.00	60	0.1350	1910	258
		12.00	60	0.1650	1590	262
		16.00	60	0.2200	1195	263
	Cast iron (lamellar / spheroidal) 	3.00	180	0.0800	19100	1528
		4.00	180	0.1050	14325	1504
		5.00	180	0.1300	11460	1490
		6.00	180	0.1600	9550	1528
		8.00	180	0.2100	7160	1504
		10.00	180	0.2650	5730	1519
		12.00	180	0.3150	4775	1504
		16.00	180	0.4200	3580	1504
	Wrought aluminium alloys Si < 6% hardened 	3.00	220	0.0800	23345	1868
		4.00	220	0.1050	17505	1838
		5.00	220	0.1300	14005	1821
		6.00	220	0.1600	11670	1867
		8.00	220	0.2100	8755	1839
		10.00	220	0.2650	7005	1856
		12.00	220	0.3150	5835	1838
		16.00	220	0.4200	4375	1838

Center drills

120°

HM	
MG10	



ReTool®

Rm <850 HRC <24	Rm 850-1100 HRC 24-34	Rm 1100-1300 HRC 34-42					Inox Stainless		GG(G) Aluminium
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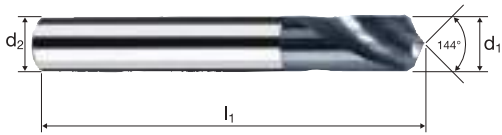
Example: Order-N°.				Article-N°.		ø-Code				POLYCHROM	
				B92020		0300				B92020	
Ø Code	d ₁ h6	d ₂ h6	l ₁								
0300	3.00	3.0	50.0								●
0400	4.00	4.0	50.0								●
0500	5.00	5.0	50.0								●
0600	6.00	6.0	57.0								●
0800	8.00	8.0	63.0								●
1000	10.00	10.0	72.0								●
1200	12.00	12.0	83.0								●
1600	16.00	16.0	92.0								●
							</				

Application	Material	d_1 [mm]	v_c [m/min]	f [mm]	n [min ⁻¹]	v_f [mm/min]
	Steel $< 500 \text{ N/mm}^2$ 	3.00	160	0.0700	16975	1188
		4.00	160	0.0950	12730	1209
		5.00	160	0.1200	10185	1222
		6.00	160	0.1450	8490	1231
		8.00	160	0.1900	6365	1209
		10.00	160	0.2400	5095	1223
		12.00	160	0.2850	4245	1210
		16.00	160	0.3800	3185	1210
	Steel 500 - 850 N/mm ² 	3.00	120	0.0700	12730	891
		4.00	120	0.0950	9550	907
		5.00	120	0.1200	7640	917
		6.00	120	0.1450	6365	923
		8.00	120	0.1900	4775	907
		10.00	120	0.2400	3820	917
		12.00	120	0.2850	3185	908
		16.00	120	0.3800	2385	906
	Steel 850 - 1100 N/mm ² 	3.00	90	0.0600	9550	573
		4.00	90	0.0750	7160	537
		5.00	90	0.0950	5730	544
		6.00	90	0.1150	4775	549
		8.00	90	0.1550	3580	555
		10.00	90	0.1900	2865	544
		12.00	90	0.2300	2385	549
		16.00	90	0.3100	1790	555
	Steel 1100 - 1300 N/mm ² 	3.00	60	0.0500	6365	318
		4.00	60	0.0650	4775	310
		5.00	60	0.0800	3820	306
		6.00	60	0.0950	3185	303
		8.00	60	0.1250	2385	298
		10.00	60	0.1600	1910	306
		12.00	60	0.1900	1590	302
		16.00	60	0.2550	1195	305
	Steel 1300 - 1500 N/mm ² 	3.00	30	0.0500	3185	159
		4.00	30	0.0650	2385	155
		5.00	30	0.0800	1910	153
		6.00	30	0.0950	1590	151
		8.00	30	0.1250	1195	149
		10.00	30	0.1600	955	153
		12.00	30	0.1900	795	151
		16.00	30	0.2550	595	152
	Stainless steel [Cr-Ni/1.4301] 	3.00	60	0.0400	6365	255
		4.00	60	0.0550	4775	263
		5.00	60	0.0700	3820	267
		6.00	60	0.0800	3185	255
		8.00	60	0.1100	2385	262
		10.00	60	0.1350	1910	258
		12.00	60	0.1650	1590	262
		16.00	60	0.2200	1195	263
	Cast iron (lamellar / spheroidal) 	3.00	180	0.0800	19100	1528
		4.00	180	0.1050	14325	1504
		5.00	180	0.1300	11460	1490
		6.00	180	0.1600	9550	1528
		8.00	180	0.2100	7160	1504
		10.00	180	0.2650	5730	1519
		12.00	180	0.3150	4775	1504
		16.00	180	0.4200	3580	1504
	Wrought aluminium alloys Si < 6% hardened 	3.00	220	0.0800	23345	1868
		4.00	220	0.1050	17505	1838
		5.00	220	0.1300	14005	1821
		6.00	220	0.1600	11670	1867
		8.00	220	0.2100	8755	1839
		10.00	220	0.2650	7005	1856
		12.00	220	0.3150	5835	1838
		16.00	220	0.4200	4375	1838

Center drills

144°

HM	
MG10	



ReTool®

Rm <850 HRC <24	Rm 850-1100 HRC 24-34	Rm 1100-1300 HRC 34-42					Inox Stainless		GG(G) Aluminium
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Example: Order-N°.				Article-N°.		ø-Code				POLYCHROM	
				B92008		0300				B92008	
Ø Code	d ₁ h6	d ₂ h6	l ₁								
0300	3.00	3.0	50.0								●
0400	4.00	4.0	50.0								●
0500	5.00	5.0	50.0								●
0600	6.00	6.0	57.0								●
0800	8.00	8.0	63.0								●
1000	10.00	10.0	72.0								●
1200	12.00	12.0	83.0								●
1600	16.00	16.0	92.0								●
							</				



90°

HSS

Rm
<850
HRC
<24

Rm
850-1100
HRC
24-34

Inox Stainless

GG(G)
Aluminium[illegible]



Thread milling cutters M / MF / G / UNC / UNF / UN / NPT / NPTF

Thread whirler

N° EH27500



N° EH27502



N° EI27504



N° EH27540



N° EH27560



M	3xd		Rm <850-1500 HRC <24-48	Inox Ti Ni	157
M	3xd		Rm <850-1500 HRC <24-48	Inox Ti Ni	159
M	3xd		HRC 48->60		161
G	3xd		Rm <850-1500 HRC <24-48	Inox Ti Ni	163
UN	3xd		Rm <850-1500 HRC <24-48	Inox Stainless	165

TM

Thread milling cutters M / MF / G / UNC / UNF / UN / NPT / NPTF

Thread milling cutters

N° EH20300 / EH20306



N° EH20320 / EH20326



N° EH20340



N° EH20360



N° EH20370



N° EH20380



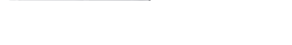
N° EH20390



M	2xd		Rm < 850-1500 HRC < 24-48	Al / Cu GG(G)	167
MF	2xd		Rm < 850-1500 HRC < 24-48	Al / Cu GG(G)	169
G	2xd		Rm < 850-1500 HRC < 24-48	Al / Cu GG(G)	171
UNC	2xd		Rm < 850-1500 HRC < 24-48	Al / Cu GG(G)	173
UNF	2xd		Rm < 850-1500 HRC < 24-48	Al / Cu GG(G)	175
NPT			Rm < 850-1500 HRC < 24-48	Al / Cu GG(G)	177
NPTF			Rm < 850-1500 HRC < 24-48	Al / Cu GG(G)	179

Thread milling cutters M / MF / G / UNC / UNF / UN / NPT / NPTF

Thread milling cutters with 45° chamfer

N° EH24300		M	2xd		Rm <850-1500 HRC <24-48	Al / Cu GG(G)	181
N° EH24320		MF	2xd		Rm <850-1500 HRC <24-48	Al / Cu GG(G)	183
N° EH24340		G	2xd		Rm <850-1500 HRC <24-48	Al / Cu GG(G)	185
N° EH24360		UNC	2xd		Rm <850-1500 HRC <24-48	Al / Cu GG(G)	187
N° EH24370		UNF	2xd		Rm <850-1500 HRC <24-48	Al / Cu GG(G)	189
N° EH24200		M	1.5xd		HRC <56	Al / Cu GG(G)	191
N° EH24220		MF	1.5xd		Rm <850-1500 HRC <24-48	Al / Cu GG(G)	193

TM

Thread milling cutters M / MF / G / UNC / UNF / UN / NPT / NPTF

Drill / thread milling cutters with 45° chamfer

N° E22300



M	2xd		Al Aluminium Cast	GG(G) Cast iron	195
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N° E22200



M	1.5xd		Al Aluminium Cast	GG(G) Cast iron	197
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Thread milling cutters M / MF / G / UNC / UNF / UN / NPT / NPTF

Multi-range thread milling cutters

N° EH26020



M			Rm <850-1500 HRC <24-48	Al / Cu GG(G)	199
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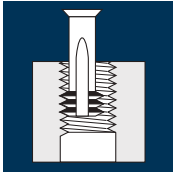
N° EH26040



G			Rm <850-1500 HRC <24-48	Al / Cu GG(G)	201
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TM

Application



Material

Steel
850 - 1100 N/mm²



Steel
1300 - 1500 N/mm²



Stainless steel
[Cr-Ni/1.4301]



Nickel base alloys
hardened



Wrought aluminium
alloys
Si < 6%
hardened



Cast iron
(lamellar / spheroidal)



Unalloyed copper

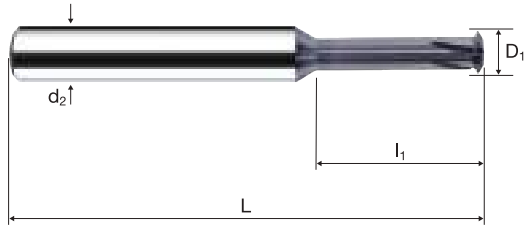


Titanium alloys
> 300 HB
[Ti6Al4V]



M	D ₁ [mm]	p _{max}	z	v _c [m/min]	f _z [mm]	n [min ⁻¹]	v _{fc} [mm/min]	v _f [mm/min]
M 1.4 - M 1.8	1.05	0.35	3	80	0.0100	24250	250	728
M 2 - M 2.4	1.50	0.40	3	80	0.0100	16975	127	509
M 2.5 - M 3	2.00	0.50	4	80	0.0200	12730	339	1018
M 3.5 - M 4.5	2.80	0.75	4	80	0.0200	9095	275	728
M 5 - M 7	4.00	1.00	4	80	0.0250	6365	212	637
M 8 - M 10	6.40	1.50	5	80	0.0350	3980	251	697
M 1.4 - M 1.8	1.05	0.35	3	45	0.0100	13640	141	409
M 2 - M 2.4	1.50	0.40	3	45	0.0100	9550	72	287
M 2.5 - M 3	2.00	0.50	4	45	0.0200	7160	191	573
M 3.5 - M 4.5	2.80	0.75	4	45	0.0200	5115	155	409
M 5 - M 7	4.00	1.00	4	45	0.0300	3580	143	430
M 8 - M 10	6.40	1.50	5	45	0.0300	2240	121	336
M 1.4 - M 1.8	1.05	0.35	3	55	0.0100	16675	172	500
M 2 - M 2.4	1.50	0.40	3	55	0.0100	11670	88	350
M 2.5 - M 3	2.00	0.50	4	55	0.0200	8755	233	700
M 3.5 - M 4.5	2.80	0.75	4	55	0.0250	6255	236	626
M 5 - M 7	4.00	1.00	4	55	0.0300	4375	175	525
M 8 - M 10	6.40	1.50	5	55	0.0300	2735	148	410
M 1.4 - M 1.8	1.05	0.35	3	30	0.0100	9095	94	273
M 2 - M 2.4	1.50	0.40	3	30	0.0100	6365	48	191
M 2.5 - M 3	2.00	0.50	4	30	0.0100	4775	64	191
M 3.5 - M 4.5	2.80	0.75	4	30	0.0150	3410	77	205
M 5 - M 7	4.00	1.00	4	30	0.0200	2385	64	191
M 8 - M 10	6.40	1.50	5	30	0.0300	1490	80	224
M 1.4 - M 1.8	1.05	0.35	3	150	0.0200	45475	938	2729
M 2 - M 2.4	1.50	0.40	3	150	0.0200	31830	477	1910
M 2.5 - M 3	2.00	0.50	4	150	0.0300	23875	955	2865
M 3.5 - M 4.5	2.80	0.75	4	150	0.0350	17050	902	2387
M 5 - M 7	4.00	1.00	4	150	0.0400	11935	637	1910
M 8 - M 10	6.40	1.50	5	150	0.0500	7460	671	1865
M 1.4 - M 1.8	1.05	0.35	3	120	0.0100	36380	375	1091
M 2 - M 2.4	1.50	0.40	3	120	0.0100	25465	191	764
M 2.5 - M 3	2.00	0.50	4	120	0.0200	19100	509	1528
M 3.5 - M 4.5	2.80	0.75	4	120	0.0250	13640	515	1364
M 5 - M 7	4.00	1.00	4	120	0.0300	9550	382	1146
M 8 - M 10	6.40	1.50	5	120	0.0400	5970	430	1194
M 1.4 - M 1.8	1.05	0.35	3	130	0.0100	39410	406	1182
M 2 - M 2.4	1.50	0.40	3	130	0.0100	27585	207	828
M 2.5 - M 3	2.00	0.50	4	130	0.0200	20690	552	1655
M 3.5 - M 4.5	2.80	0.75	4	130	0.0250	14780	558	1478
M 5 - M 7	4.00	1.00	4	130	0.0300	10345	414	1241
M 8 - M 10	6.40	1.50	5	130	0.0400	6465	465	1293
M 1.4 - M 1.8	1.05	0.35	3	40	0.0100	12125	125	364
M 2 - M 2.4	1.50	0.40	3	40	0.0100	8490	64	255
M 2.5 - M 3	2.00	0.50	4	40	0.0100	6365	85	255
M 3.5 - M 4.5	2.80	0.75	4	40	0.0150	4545	103	273
M 5 - M 7	4.00	1.00	4	40	0.0200	3185	85	255
M 8 - M 10	6.40	1.50	5	40	0.0300	1990	107	299

3xd

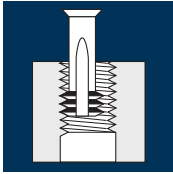


TM

Rm <850 HRC <24	Rm 850-1100 HRC 24-34	Rm 1100-1300 HRC 34-42	Rm 1300-1500 HRC 42-48				Inox Stainless	Ti Titanium	Aluminium / Copper GG(G) Nickel-Alloys
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[illegible]

Application



Material

Steel
850 - 1100 N/mm²



Steel
1300 - 1500 N/mm²



Stainless steel
[Cr-Ni/1.4301]



Nickel base alloys
hardened



Wrought aluminium
alloys
Si < 6%
hardened



Cast iron
(lamellar / spheroidal)



Unalloyed copper

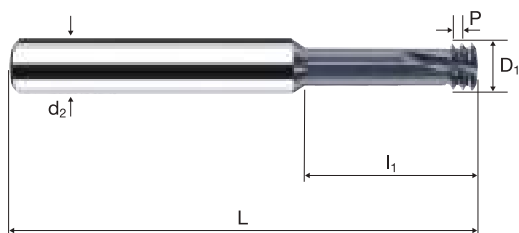
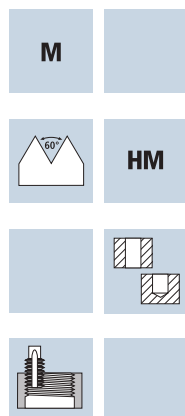


Titanium alloys
> 300 HB
[Ti6Al4V]



M	D ₁ [mm]	P [mm]	z	v _c [m/min]	f _z [mm]	n [min ⁻¹]	v _{fc} [mm/min]	v _f [mm/min]
M 2	1.55	0.40	4	80	0.0100	16430	148	657
M 3	2.40	0.50	4	80	0.0200	10610	170	849
M 4	3.20	0.70	4	80	0.0200	7960	127	637
M 5	4.00	0.80	4	80	0.0250	6365	127	637
M 6	4.80	1.00	4	80	0.0300	5305	127	637
M 8	5.95	1.25	4	80	0.0350	4280	154	599
M 10	7.80	1.50	4	80	0.0500	3265	144	653
M 12	9.00	1.75	4	80	0.0550	2830	156	623
M 16	11.80	2.00	5	80	0.0600	2160	170	648
M 2	1.55	0.40	4	45	0.0100	9240	83	370
M 3	2.40	0.50	4	45	0.0200	5970	96	478
M 4	3.20	0.70	4	45	0.0250	4475	90	448
M 5	4.00	0.80	4	45	0.0300	3580	86	430
M 6	4.80	1.00	4	45	0.0300	2985	72	358
M 8	5.95	1.25	4	45	0.0300	2405	74	289
M 10	7.80	1.50	4	45	0.0400	1835	65	294
M 12	9.00	1.75	4	45	0.0500	1590	80	318
M 16	11.80	2.00	5	45	0.0550	1215	88	334
M 2	1.55	0.40	4	55	0.0100	11295	102	452
M 3	2.40	0.50	4	55	0.0200	7295	117	584
M 4	3.20	0.70	4	55	0.0250	5470	109	547
M 5	4.00	0.80	4	55	0.0300	4375	105	525
M 6	4.80	1.00	4	55	0.0300	3645	87	437
M 8	5.95	1.25	4	55	0.0300	2940	90	353
M 10	7.80	1.50	4	55	0.0350	2245	69	314
M 12	9.00	1.75	4	55	0.0500	1945	97	389
M 16	11.80	2.00	5	55	0.0550	1485	107	408
M 2	1.55	0.40	4	30	0.0100	6160	55	246
M 3	2.40	0.50	4	30	0.0100	3980	32	159
M 4	3.20	0.70	4	30	0.0150	2985	36	179
M 5	4.00	0.80	4	30	0.0200	2385	38	191
M 6	4.80	1.00	4	30	0.0250	1990	40	199
M 8	5.95	1.25	4	30	0.0300	1605	49	193
M 10	7.80	1.50	4	30	0.0350	1225	38	172
M 12	9.00	1.75	4	30	0.0400	1060	42	170
M 16	11.80	2.00	5	30	0.0450	810	48	182
M 2	1.55	0.40	4	150	0.0200	30805	554	2464
M 3	2.40	0.50	4	150	0.0300	19895	477	2387
M 4	3.20	0.70	4	150	0.0350	14920	418	2089
M 5	4.00	0.80	4	150	0.0400	11935	382	1910
M 6	4.80	1.00	4	150	0.0450	9945	358	1790
M 8	5.95	1.25	4	150	0.0500	8025	411	1605
M 10	7.80	1.50	4	150	0.0550	6120	296	1346
M 12	9.00	1.75	4	150	0.0650	5305	345	1379
M 16	11.80	2.00	5	150	0.0750	4045	398	1517
M 2	1.55	0.40	4	120	0.0100	24645	222	986
M 3	2.40	0.50	4	120	0.0200	15915	255	1273
M 4	3.20	0.70	4	120	0.0250	11935	239	1194
M 5	4.00	0.80	4	120	0.0300	9550	229	1146
M 6	4.80	1.00	4	120	0.0350	7960	223	1114
M 8	5.95	1.25	4	120	0.0400	6420	263	1027
M 10	7.80	1.50	4	120	0.0500	4895	215	979
M 12	9.00	1.75	4	120	0.0600	4245	255	1019
M 16	11.80	2.00	5	120	0.0700	3235	297	1132
M 2	1.55	0.40	4	130	0.0100	26695	240	1068
M 3	2.40	0.50	4	130	0.0200	17240	276	1379
M 4	3.20	0.70	4	130	0.0250	12930	259	1293
M 5	4.00	0.80	4	130	0.0300	10345	248	1241
M 6	4.80	1.00	4	130	0.0350	8620	241	1207
M 8	5.95	1.25	4	130	0.0400	6955	285	1113
M 10	7.80	1.50	4	130	0.0450	5305	210	955
M 12	9.00	1.75	4	130	0.0550	4600	253	1012
M 16	11.80	2.00	5	130	0.0600	3505	276	1052
M 2	1.55	0.40	4	40	0.0100	8215	74	329
M 3	2.40	0.50	4	40	0.0100	5305	42	212
M 4	3.20	0.70	4	40	0.0150	3980	48	239
M 5	4.00	0.80	4	40	0.0200	3185	51	255
M 6	4.80	1.00	4	40	0.0250	2655	53	266
M 8	5.95	1.25	4	40	0.0300	2140	66	257
M 10	7.80	1.50	4	40	0.0350	1630	50	228
M 12	9.00	1.75	4	40	0.0400	1415	57	226
M 16	11.80	2.00	5	40	0.0450	1080	64	243

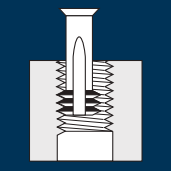
3xd



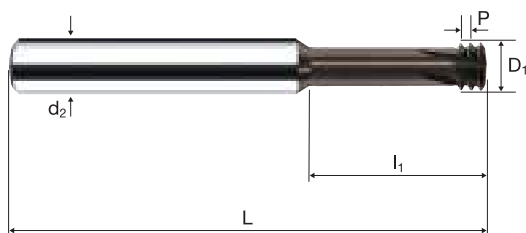
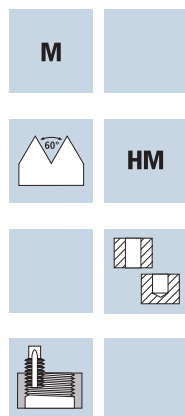
TM

Rm ≤ 850 HRC ≤ 24	Rm 850-1100 HRC 24-34	Rm 1100-1300 HRC 34-42	Rm 1300-1500 HRC 42-48				Inox Stainless	Ti Titanium	Aluminium / Copper GG(G) Nickel-Alloys
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[illegible]

Application	Material	M	D ₁ [mm]	P [mm]	z	v _c [m/min]	f _z [mm]	n [min ⁻¹]	v _{fc} [mm/min]	v _f [mm/min]
	Hardened tool steel 48 - 52 HRC 	M 2	1.55	0.40	4	45	0.0100	9240	83	370
		M 2.5	1.95	0.45	4	45	0.0100	7345	65	294
		M 3	2.35	0.50	4	45	0.0100	6095	53	244
		M 4	3.10	0.70	4	45	0.0150	4620	62	277
	Hardened tool steel 52 - 56 HRC 	M 5	3.80	0.80	4	45	0.0200	3770	72	302
		M 6	4.80	1.00	4	45	0.0250	2985	60	299
		M 8	5.95	1.25	4	45	0.0300	2405	74	289
		M 10	7.80	1.50	4	45	0.0350	1835	57	257
	Hardened tool steel 56 - 60 HRC 	M 12	9.00	1.75	5	45	0.0400	1590	80	318
		M 2	1.55	0.40	4	45	0.0100	9240	83	370
		M 2.5	1.95	0.45	4	45	0.0100	7345	65	294
		M 3	2.35	0.50	4	45	0.0100	6095	53	244
	Hardened tool steel > 60 HRC 	M 4	3.10	0.70	4	45	0.0150	4620	62	277
		M 5	3.80	0.80	4	45	0.0200	3770	72	302
		M 6	4.80	1.00	4	45	0.0250	2985	60	299
		M 8	5.95	1.25	4	45	0.0300	2405	74	289
		M 10	7.80	1.50	4	45	0.0350	1835	57	257
		M 12	9.00	1.75	5	45	0.0400	1590	80	318
		M 2	1.55	0.40	4	40	0.0100	8215	74	329
		M 2.5	1.95	0.45	4	40	0.0100	6530	57	261
		M 3	2.35	0.50	4	40	0.0100	5420	47	217
		M 4	3.10	0.70	4	40	0.0150	4105	55	246
		M 5	3.80	0.80	4	40	0.0200	3350	64	268
		M 6	4.80	1.00	4	40	0.0250	2655	53	266
		M 8	5.95	1.25	4	40	0.0300	2140	66	257
		M 10	7.80	1.50	4	40	0.0350	1630	50	228
		M 12	9.00	1.75	5	40	0.0400	1415	71	283
		M 2	1.55	0.40	4	35	0.0100	7190	65	288
		M 2.5	1.95	0.45	4	35	0.0100	5715	50	229
		M 3	2.35	0.50	4	35	0.0100	4740	41	190
		M 4	3.10	0.70	4	35	0.0150	3595	49	216
		M 5	3.80	0.80	4	35	0.0200	2930	56	234
		M 6	4.80	1.00	4	35	0.0250	2320	46	232
		M 8	5.95	1.25	4	35	0.0300	1870	58	224
		M 10	7.80	1.50	4	35	0.0350	1430	44	200
		M 12	9.00	1.75	5	35	0.0400	1240	62	248

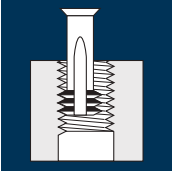
3xd



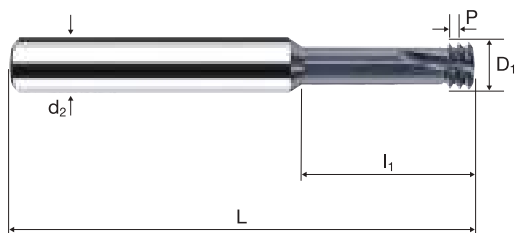
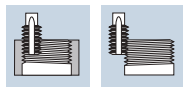
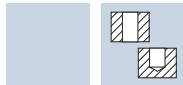
TM

Rm	HRC	HRC	HRC			
1300-1500	48-56	56-60	> 60			
HRC						
42-48						

[illegible]

Application	Material	G	D ₁ [mm]	P(TPI)	z	v _c [m/min]	f _z [mm]	n [min ⁻¹]	v _{fc} [mm/min]	v _f [mm/min]
	Steel 850 - 1100 N/mm ² 	G 1/16 - G 1/8	6.20	28.0	4	80	0.0350	4105	208	575
		G 1/4 - G 3/8	9.95	19.0	4	80	0.0600	2560	248	614
		G 1/2 - G 7/8	11.95	14.0	4	80	0.0600	2130	309	511
		G 1" - G 2"	15.95	11.0	5	80	0.0650	1595	380	518
	Steel 1300 - 1500 N/mm ² 	G 1/16 - G 1/8	6.20	28.0	4	45	0.0300	2310	101	277
		G 1/4 - G 3/8	9.95	19.0	4	45	0.0550	1440	128	317
		G 1/2 - G 7/8	11.95	14.0	4	45	0.0600	1200	174	288
		G 1" - G 2"	15.95	11.0	5	45	0.0650	900	214	293
	Stainless steel [Cr-Ni/1.4301] 	G 1/16 - G 1/8	6.20	28.0	4	55	0.0300	2825	123	339
		G 1/4 - G 3/8	9.95	19.0	4	55	0.0550	1760	156	387
		G 1/2 - G 7/8	11.95	14.0	4	55	0.0600	1465	212	352
		G 1" - G 2"	15.95	11.0	5	55	0.0650	1100	262	358
	Nickel base alloys hardened 	G 1/16 - G 1/8	6.20	28.0	4	30	0.0300	1540	67	185
		G 1/4 - G 3/8	9.95	19.0	4	30	0.0400	960	62	154
		G 1/2 - G 7/8	11.95	14.0	4	30	0.0500	800	97	160
		G 1" - G 2"	15.95	11.0	5	30	0.0600	600	132	180
	Wrought aluminium alloys Si < 6% hardened 	G 1/16 - G 1/8	6.20	28.0	4	150	0.0500	7700	559	1540
		G 1/4 - G 3/8	9.95	19.0	4	150	0.0700	4800	541	1344
		G 1/2 - G 7/8	11.95	14.0	4	150	0.0800	3995	773	1278
		G 1" - G 2"	15.95	11.0	5	150	0.0900	2995	987	1348
	Cast iron (lamellar / spheroidal) 	G 1/16 - G 1/8	6.20	28.0	4	120	0.0400	6160	357	986
		G 1/4 - G 3/8	9.95	19.0	4	120	0.0650	3840	402	998
		G 1/2 - G 7/8	11.95	14.0	4	120	0.0700	3195	541	895
		G 1" - G 2"	15.95	11.0	5	120	0.0900	2395	789	1078
	Unalloyed copper 	G 1/16 - G 1/8	6.20	28.0	4	130	0.0400	6675	387	1068
		G 1/4 - G 3/8	9.95	19.0	4	130	0.0600	4160	402	998
		G 1/2 - G 7/8	11.95	14.0	4	130	0.0650	3465	544	901
		G 1" - G 2"	15.95	11.0	5	130	0.0750	2595	713	973
	Titanium alloys > 300 HB [Ti6Al4V] 	G 1/16 - G 1/8	6.20	28.0	4	40	0.0300	2055	89	247
		G 1/4 - G 3/8	9.95	19.0	4	40	0.0400	1280	83	205
		G 1/2 - G 7/8	11.95	14.0	4	40	0.0500	1065	129	213
		G 1" - G 2"	15.95	11.0	5	40	0.0600	800	176	240

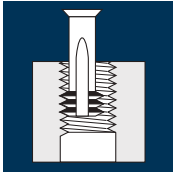
3xd



Rm ≤ 850 HRC ≤ 24	Rm 850-1100 HRC 24-34	Rm 1100-1300 HRC 34-42	Rm 1300-1500 HRC 42-48				Inox Stainless	Ti Titanium	Aluminium / Copper GG(G) Nickel-Alloys
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[illegible]

Application



Material

Steel
< 850 N/mm²



Steel
850 - 1100 N/mm²



Steel
1100 - 1300 N/mm²



Steel
1300 - 1500 N/mm²



Wrought aluminium
alloys
Si < 6%
hardened



Cast iron
(lamellar / spheroidal)



Unalloyed copper



Stainless steel
[Cr-Ni/1.4301]



UN	D ₁ [mm]	P(TPI)	z	v _c [m/min]	f _z [mm]	n [min ⁻¹]	v _{fc} [mm/min]	v _f [mm/min]
UNC Nr.1 UNF Nr.2	1.40	64.0	3	90	0.0100	20465	150	614
UNC Nr.3 UNF Nr.4	1.90	48.0	4	90	0.0200	15080	295	1206
UNC Nr.5 UNF Nr.6	2.45	40.0	4	90	0.0200	11695	214	936
UNC Nr.8	3.20	32.0	4	90	0.0200	8950	166	716
UNC Nr.10-12	3.50	24.0	4	90	0.0250	8185	225	819
UNC 1/4	4.75	20.0	4	90	0.0300	6030	182	724
UNF 7/16	8.00	20.0	4	90	0.0500	3580	201	716
UNF 5/8	12.00	18.0	4	90	0.0600	2385	140	572
UNC 3/8	6.70	16.0	4	90	0.0450	4275	228	770
UNC Nr.1 UNF Nr.2	1.40	64.0	3	80	0.0100	18190	134	546
UNC Nr.3 UNF Nr.4	1.90	48.0	4	80	0.0200	13405	262	1072
UNC Nr.5 UNF Nr.6	2.45	40.0	4	80	0.0200	10395	190	832
UNC Nr.8	3.20	32.0	4	80	0.0200	7960	148	637
UNC Nr.10-12	3.50	24.0	4	80	0.0250	7275	200	728
UNC 1/4	4.75	20.0	4	80	0.0300	5360	162	643
UNF 7/16	8.00	20.0	4	80	0.0500	3185	178	637
UNF 5/8	12.00	18.0	4	80	0.0600	2120	124	509
UNC 3/8	6.70	16.0	4	80	0.0450	3800	203	684
UNC Nr.1 UNF Nr.2	1.40	64.0	3	60	0.0100	13640	100	409
UNC Nr.3 UNF Nr.4	1.90	48.0	4	60	0.0200	10050	197	804
UNC Nr.5 UNF Nr.6	2.45	40.0	4	60	0.0200	7795	142	624
UNC Nr.8	3.20	32.0	4	60	0.0250	5970	138	597
UNC Nr.10-12	3.50	24.0	4	60	0.0250	5455	150	546
UNC 1/4	4.75	20.0	4	60	0.0300	4020	122	482
UNF 7/16	8.00	20.0	4	60	0.0400	2385	107	382
UNF 5/8	12.00	18.0	4	60	0.0600	1590	93	382
UNC 3/8	6.70	16.0	4	60	0.0350	2850	118	399
UNC Nr.1 UNF Nr.2	1.40	64.0	3	45	0.0100	10230	75	307
UNC Nr.3 UNF Nr.4	1.90	48.0	4	45	0.0200	7540	148	603
UNC Nr.5 UNF Nr.6	2.45	40.0	4	45	0.0200	5845	107	468
UNC Nr.8	3.20	32.0	4	45	0.0250	4475	104	448
UNC Nr.10-12	3.50	24.0	4	45	0.0250	4095	113	410
UNC 1/4	4.75	20.0	4	45	0.0300	3015	91	362
UNF 7/16	8.00	20.0	4	45	0.0400	1790	80	286
UNF 5/8	12.00	18.0	4	45	0.0600	1195	70	287
UNC 3/8	6.70	16.0	4	45	0.0350	2140	89	300
UNC Nr.1 UNF Nr.2	1.40	64.0	3	150	0.0200	34105	501	2046
UNC Nr.3 UNF Nr.4	1.90	48.0	4	150	0.0300	25130	737	3016
UNC Nr.5 UNF Nr.6	2.45	40.0	4	150	0.0300	19490	534	2339
UNC Nr.8	3.20	32.0	4	150	0.0350	14920	484	2089
UNC Nr.10-12	3.50	24.0	4	150	0.0400	13640	600	2182
UNC 1/4	4.75	20.0	4	150	0.0450	10050	456	1809
UNF 7/16	8.00	20.0	4	150	0.0600	5970	401	1433
UNF 5/8	12.00	18.0	4	150	0.0800	3980	311	1274
UNC 3/8	6.70	16.0	4	150	0.0550	7125	465	1568
UNC Nr.1 UNF Nr.2	1.40	64.0	3	120	0.0100	27285	200	819
UNC Nr.3 UNF Nr.4	1.90	48.0	4	120	0.0200	20105	393	1608
UNC Nr.5 UNF Nr.6	2.45	40.0	4	120	0.0200	15590	285	1247
UNC Nr.8	3.20	32.0	4	120	0.0250	11935	277	1194
UNC Nr.10-12	3.50	24.0	4	120	0.0250	10915	300	1092
UNC 1/4	4.75	20.0	4	120	0.0350	8040	284	1126
UNF 7/16	8.00	20.0	4	120	0.0500	4775	267	955
UNF 5/8	12.00	18.0	4	120	0.0700	3185	218	892
UNC 3/8	6.70	16.0	4	120	0.0450	5700	304	1026
UNC Nr.1 UNF Nr.2	1.40	64.0	3	130	0.0100	29555	217	887
UNC Nr.3 UNF Nr.4	1.90	48.0	4	130	0.0100	21780	213	871
UNC Nr.5 UNF Nr.6	2.45	40.0	4	130	0.0200	16890	309	1351
UNC Nr.8	3.20	32.0	4	130	0.0250	12930	300	1293
UNC Nr.10-12	3.50	24.0	4	130	0.0250	11825	325	1183
UNC 1/4	4.75	20.0	4	130	0.0350	8710	307	1219
UNF 7/16	8.00	20.0	4	130	0.0500	5175	290	1035
UNF 5/8	12.00	18.0	4	130	0.0650	3450	219	897
UNC 3/8	6.70	16.0	4	130	0.0400	6175	293	988
UNC Nr.1 UNF Nr.2	1.40	64.0	3	55	0.0100	12505	92	375
UNC Nr.3 UNF Nr.4	1.90	48.0	4	55	0.0200	9215	180	737
UNC Nr.5 UNF Nr.6	2.45	40.0	4	55	0.0200	7145	131	572
UNC Nr.8	3.20	32.0	4	55	0.0250	5470	127	547
UNC Nr.10-12	3.50	24.0	4	55	0.0250	5000	137	500
UNC 1/4	4.75	20.0	4	55	0.0300	3685	111	442
UNF 7/16	8.00	20.0	4	55	0.0400	2190	98	350
UNF 5/8	12.00	18.0	4	55	0.0600	1460	86	350
UNC 3/8	6.70	16.0	4	55	0.0350	2615	109	366

Thread whirler

3xd

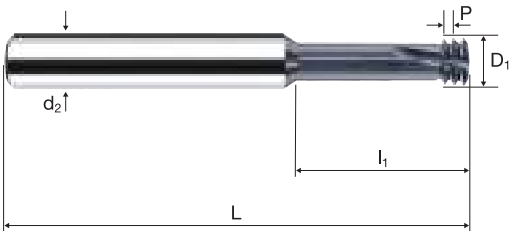
UN



HM







TM

Rm <850
HRC <24

Rm 850-1100
HRC 24-34

Rm 1100-1300
HRC 34-42

Rm 1300-1500
HRC 42-48

Inox
Stainless

Aluminium / Copper
GG(G)

Example: Order-Nº. Article-Nº. EH27560 ø-Code 750										TiCN
										EH27560
Ø Code	d	P(TPI)	L	l ₁	d ₂ h ₆	D1	Rk 2B			
750	UNF Nr.1	72.0	39	5.8	3.0	1.45	0.700	3	3	●
751	UNC Nr.1 UNF Nr.2	64.0	39	6.0	3.0	1.40	0.670	3	3	●
752	UNC Nr.2 UNF Nr.3	56.0	39	7.0	3.0	1.65	0.800	4	3	●
753	UNC Nr.3 UNF Nr.4	48.0	39	8.0	3.0	1.90	0.920	4	3	●
755	UNC Nr.4	40.0	58	9.0	6.0	2.10	1.020	4	3	●
756	UNC Nr.5 UNF Nr.6	40.0	58	10.0	6.0	2.45	1.200	4	3	●
757	UNF Nr.8	36.0	58	12.0	6.0	3.30	1.620	4	3	●
758	UNC Nr.6	32.0	58	11.0	6.0	2.55	1.250	4	3	●
759	UNC Nr.8	32.0	58	13.0	6.0	3.20	1.570	4	3	●
760	UNF Nr.10	32.0	58	15.0	6.0	3.70	1.820	4	3	●
761	UNF Nr.12	28.0	58	16.0	6.0	4.20	2.070	4	3	●
762	UNF 1/4	28.0	58	19.6	6.0	5.00	2.470	4	3	●
763	UNC Nr.10-12	24.0	58	16.0	6.0	3.50	1.720	4	3	●
764	UNF 5/16-3/8	24.0	64	24.0	8.0	6.60	3.270	4	3	●
765	UNC 1/4	20.0	58	20.0	6.0	4.75	2.320	4	3	●
766	UNF 7/16	20.0	64	34.6	8.0	8.00	3.940	4	3	●
767	UNC 5/16	18.0	58	23.0	6.0	6.00	2.940	4	3	●
768	UNF 5/8	18.0	84	35.0	12.0	12.00	5.940	4	3	●
769	UNC 3/8	16.0	64	25.0	8.0	6.70	3.290	4	3	●
770	UNC 7/16	14.0	64	25.0	8.0	7.70	3.790	4	3	●

Application



Material

Steel
< 850 N/mm²



Steel
850 - 1100 N/mm²



Steel
1100 - 1300 N/mm²



Steel
1300 - 1500 N/mm²



Wrought aluminium
alloys
Si < 6%
hardened



Cast iron
(lamellar / spheroidal)



Unalloyed copper

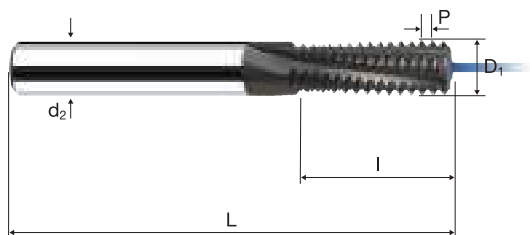
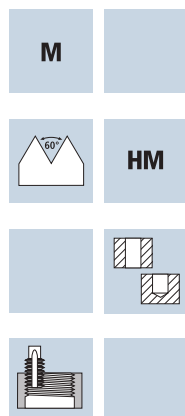


Stainless steel
[Cr-Ni/1.4301]



M	D ₁ [mm]	P [mm]	z	v _c [m/min]	f _z [mm]	n [min ⁻¹]	v _{fc} [mm/min]	v _f [mm/min]
M 3	2.30	0.50	3	90	0.0160	12455	139	598
M 4	3.00	0.70	3	90	0.0160	9550	115	458
M 5	4.00	0.80	3	90	0.0200	7160	86	430
M 6	4.80	1.00	3	90	0.0240	5970	86	430
M 8	6.40	1.25	3	90	0.0280	4475	75	376
M 10	7.95	1.50	3	90	0.0400	3605	89	433
M 12	9.95	1.75	4	90	0.0480	2880	94	553
M 14	11.20	2.00	4	90	0.0480	2560	98	492
M 16	12.80	2.00	4	90	0.0480	2240	86	430
M 3	2.30	0.50	3	80	0.0160	11070	124	531
M 4	3.00	0.70	3	80	0.0160	8490	102	408
M 5	4.00	0.80	3	80	0.0200	6365	76	382
M 6	4.80	1.00	3	80	0.0240	5305	76	382
M 8	6.40	1.25	3	80	0.0280	3980	67	334
M 10	7.95	1.50	3	80	0.0400	3205	79	385
M 12	9.95	1.75	4	80	0.0480	2560	84	492
M 14	11.20	2.00	4	80	0.0480	2275	87	437
M 16	12.80	2.00	4	80	0.0480	1990	76	382
M 3	2.30	0.50	3	60	0.0160	8305	93	399
M 4	3.00	0.70	3	60	0.0160	6365	76	306
M 5	4.00	0.80	3	60	0.0200	4775	57	287
M 6	4.80	1.00	3	60	0.0200	3980	48	239
M 8	6.40	1.25	3	60	0.0240	2985	43	215
M 10	7.95	1.50	3	60	0.0320	2400	47	230
M 12	9.95	1.75	4	60	0.0440	1920	58	338
M 14	11.20	2.00	4	60	0.0440	1705	60	300
M 16	12.80	2.00	4	60	0.0480	1490	57	286
M 3	2.30	0.50	3	45	0.0080	6230	35	150
M 4	3.00	0.70	3	45	0.0120	4775	43	172
M 5	4.00	0.80	3	45	0.0160	3580	34	172
M 6	4.80	1.00	3	45	0.0200	2985	36	179
M 8	6.40	1.25	3	45	0.0240	2240	32	161
M 10	7.95	1.50	3	45	0.0280	1800	31	151
M 12	9.95	1.75	4	45	0.0360	1440	35	207
M 14	11.20	2.00	4	45	0.0360	1280	37	184
M 16	12.80	2.00	4	45	0.0400	1120	36	179
M 3	2.30	0.50	3	150	0.0240	20760	349	1495
M 4	3.00	0.70	3	150	0.0280	15915	334	1337
M 5	4.00	0.80	3	150	0.0320	11935	229	1146
M 6	4.80	1.00	3	150	0.0360	9945	215	1074
M 8	6.40	1.25	3	150	0.0400	7460	179	895
M 10	7.95	1.50	3	150	0.0480	6005	177	865
M 12	9.95	1.75	4	150	0.0560	4800	184	1075
M 14	11.20	2.00	4	150	0.0560	4265	191	955
M 16	12.80	2.00	4	150	0.0640	3730	191	955
M 3	2.30	0.50	3	120	0.0160	16605	186	797
M 4	3.00	0.70	3	120	0.0200	12730	191	764
M 5	4.00	0.80	3	120	0.0240	9550	138	688
M 6	4.80	1.00	3	120	0.0280	7960	134	669
M 8	6.40	1.25	3	120	0.0320	5970	115	573
M 10	7.95	1.50	3	120	0.0400	4805	118	577
M 12	9.95	1.75	4	120	0.0520	3840	136	799
M 14	11.20	2.00	4	120	0.0520	3410	142	709
M 16	12.80	2.00	4	120	0.0560	2985	134	669
M 3	2.30	0.50	3	130	0.0160	17990	201	864
M 4	3.00	0.70	3	130	0.0200	13795	207	828
M 5	4.00	0.80	3	130	0.0240	10345	149	745
M 6	4.80	1.00	3	130	0.0280	8620	145	724
M 8	6.40	1.25	3	130	0.0320	6465	124	621
M 10	7.95	1.50	3	130	0.0400	5205	128	625
M 12	9.95	1.75	4	130	0.0520	4160	148	865
M 14	11.20	2.00	4	130	0.0520	3695	154	769
M 16	12.80	2.00	4	130	0.0560	3235	145	725
M 3	2.30	0.50	3	55	0.0160	7610	85	365
M 4	3.00	0.70	3	55	0.0200	5835	88	350
M 5	4.00	0.80	3	55	0.0240	4375	63	315
M 6	4.80	1.00	3	55	0.0240	3645	52	262
M 8	6.40	1.25	3	55	0.0240	2735	39	197
M 10	7.95	1.50	3	55	0.0320	2200	43	211
M 12	9.95	1.75	4	55	0.0440	1760	53	310
M 14	11.20	2.00	4	55	0.0440	1565	55	275
M 16	12.80	2.00	4	55	0.0480	1370	53	263

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TM

Rm ≤ 850 HRC ≤ 24	Rm 850-1100 HRC 24-34	Rm 1100-1300 HRC 34-42	Rm 1300-1500 HRC 42-48	HRC 48-56			Inox Stainless	Ti Titanium	Aluminium / Copper GG(G)
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[illegible]

Application



Material

Steel
< 850 N/mm²



Steel
850 - 1100 N/mm²



Steel
1100 - 1300 N/mm²



Steel
1300 - 1500 N/mm²



Wrought aluminium
alloys
Si < 6%
hardened



Cast iron
(lamellar / spheroidal)



Unalloyed copper

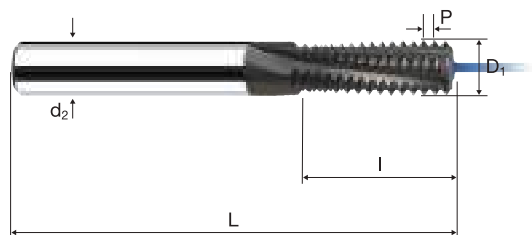


Stainless steel
[Cr-Ni/1.4301]



MF	D ₁ [mm]	P [mm]	z	v _c [m/min]	f _z [mm]	n [min ⁻¹]	v _{fc} [mm/min]	v _f [mm/min]
M 8	6.40	1.00	3	90	0.0280	4475	75	376
M 10	7.95	1.00	3	90	0.0400	3605	89	433
M 10	7.95	1.25	3	90	0.0400	3605	89	433
M 12	9.95	1.50	4	90	0.0480	2880	94	553
M 14	11.20	1.50	4	90	0.0480	2560	98	492
M 16	12.80	1.50	4	90	0.0480	2240	86	430
M 20	14.95	1.50	4	90	0.0520	1915	101	398
M 8	6.40	1.00	3	80	0.0280	3980	67	334
M 10	7.95	1.00	3	80	0.0400	3205	79	385
M 10	7.95	1.25	3	80	0.0400	3205	79	385
M 12	9.95	1.50	4	80	0.0480	2560	84	492
M 14	11.20	1.50	4	80	0.0480	2275	87	437
M 16	12.80	1.50	4	80	0.0480	1990	76	382
M 20	14.95	1.50	4	80	0.0520	1705	90	355
M 8	6.40	1.00	3	60	0.0240	2985	43	215
M 10	7.95	1.00	3	60	0.0320	2400	47	230
M 10	7.95	1.25	3	60	0.0320	2400	47	230
M 12	9.95	1.50	4	60	0.0440	1920	58	338
M 14	11.20	1.50	4	60	0.0440	1705	60	300
M 16	12.80	1.50	4	60	0.0480	1490	57	286
M 20	14.95	1.50	4	60	0.0480	1275	62	245
M 8	6.40	1.00	3	45	0.0240	2240	32	161
M 10	7.95	1.00	3	45	0.0320	1800	35	173
M 10	7.95	1.25	3	45	0.0320	1800	35	173
M 12	9.95	1.50	4	45	0.0440	1440	43	253
M 14	11.20	1.50	4	45	0.0440	1280	45	225
M 16	12.80	1.50	4	45	0.0480	1120	43	215
M 20	14.95	1.50	4	45	0.0480	960	47	184
M 8	6.40	1.00	3	150	0.0400	7460	179	895
M 10	7.95	1.00	3	150	0.0480	6005	177	865
M 10	7.95	1.25	3	150	0.0480	6005	177	865
M 12	9.95	1.50	4	150	0.0560	4800	184	1075
M 14	11.20	1.50	4	150	0.0560	4265	191	955
M 16	12.80	1.50	4	150	0.0640	3730	191	955
M 20	14.95	1.50	4	150	0.0680	3195	219	869
M 8	6.40	1.00	3	120	0.0320	5970	115	573
M 10	7.95	1.00	3	120	0.0400	4805	118	577
M 10	7.95	1.25	3	120	0.0400	4805	118	577
M 12	9.95	1.50	4	120	0.0520	3840	136	799
M 14	11.20	1.50	4	120	0.0520	3410	142	709
M 16	12.80	1.50	4	120	0.0560	2985	134	669
M 20	14.95	1.50	4	120	0.0640	2555	165	654
M 8	6.40	1.00	3	130	0.0320	6465	124	621
M 10	7.95	1.00	3	130	0.0400	5205	128	625
M 10	7.95	1.25	3	130	0.0400	5205	128	625
M 12	9.95	1.50	4	130	0.0520	4160	148	865
M 14	11.20	1.50	4	130	0.0520	3695	154	769
M 16	12.80	1.50	4	130	0.0560	3235	145	725
M 20	14.95	1.50	4	130	0.0640	2770	179	709
M 8	6.40	1.00	3	55	0.0240	2735	39	197
M 10	7.95	1.00	3	55	0.0320	2200	43	211
M 10	7.95	1.25	3	55	0.0320	2200	43	211
M 12	9.95	1.50	4	55	0.0440	1760	53	310
M 14	11.20	1.50	4	55	0.0440	1565	55	275
M 16	12.80	1.50	4	55	0.0480	1370	53	263
M 20	14.95	1.50	4	55	0.0520	1170	61	243

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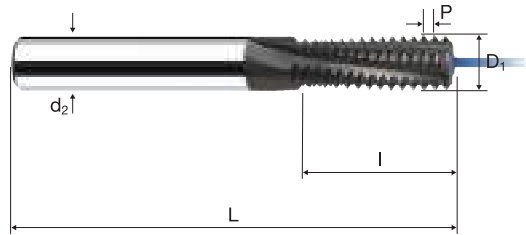
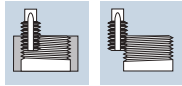
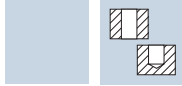
TM

Rm ≤ 850 HRC ≤ 24	Rm 850-1100 HRC 24-34	Rm 1100-1300 HRC 34-42	Rm 1300-1500 HRC 42-48	HRC 48-56			Inox Stainless	Ti Titanium	Aluminium / Copper GG(G)
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[illegible]

Application	Material	G	D ₁ [mm]	P(TPI)	z	v _c [m/min]	f _z [mm]	n [min ⁻¹]	v _{fc} [mm/min]	v _f [mm/min]
	Steel < 850 N/mm ² 	G 1/8	7.95	28.0	3	90	0.0400	3605	79	433
		G 1/4	10.50	19.0	4	90	0.0480	2730	106	524
		G 3/8	13.60	19.0	4	90	0.0520	2105	80	438
	Steel 850 - 1100 N/mm ² 	G 1/8	7.95	28.0	3	80	0.0400	3205	70	385
		G 1/4	10.50	19.0	4	80	0.0480	2425	94	466
		G 3/8	13.60	19.0	4	80	0.0520	1870	71	389
	Steel 1100 - 1300 N/mm ² 	G 1/8	7.95	28.0	3	60	0.0320	2400	42	230
		G 1/4	10.50	19.0	4	60	0.0440	1820	65	320
		G 3/8	13.60	19.0	4	60	0.5200	1405	537	2922
	Steel 1300 - 1500 N/mm ² 	G 1/8	7.95	28.0	3	45	0.0320	1800	32	173
		G 1/4	10.50	19.0	4	45	0.0440	1365	49	240
		G 3/8	13.60	19.0	4	45	0.0520	1055	40	219
	Wrought aluminium alloys Si < 6% hardened 	G 1/8	7.95	28.0	3	150	0.0480	6005	158	865
		G 1/4	10.50	19.0	4	150	0.0560	4545	206	1018
		G 3/8	13.60	19.0	4	150	0.0680	3510	175	955
	Cast iron (lamellar / spheroidal) 	G 1/8	7.95	28.0	3	120	0.0400	4805	105	577
		G 1/4	10.50	19.0	4	120	0.0520	3640	153	757
		G 3/8	13.60	19.0	4	120	0.0640	2810	132	719
	Unalloyed copper 	G 1/8	7.95	28.0	3	130	0.0400	5205	114	625
		G 1/4	10.50	19.0	4	130	0.0520	3940	165	820
		G 3/8	13.60	19.0	4	130	0.0640	3045	143	780
	Stainless steel [Cr-Ni/1.4301] 	G 1/8	7.95	28.0	3	55	0.0320	2200	39	211
		G 1/4	10.50	19.0	4	55	0.0440	1665	59	293
		G 3/8	13.60	19.0	4	55	0.0520	1285	49	267

2xd, Incool



TM

Rm <850 HRC <24	Rm 850-1100 HRC 24-34	Rm 1100-1300 HRC 34-42	Rm 1300-1500 HRC 42-48	HRC 48-56				Inox Stainless	Ti Titanium	Aluminium / Copper GG(G)
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[illegible]

Application

Material



Steel
< 850 N/mm²



Steel
850 - 1100 N/mm²



Steel
1100 - 1300 N/mm²



Steel
1300 - 1500 N/mm²



Wrought aluminium
alloys
Si < 6%
hardened



Cast iron
(lamellar / spheroidal)



Unalloyed copper

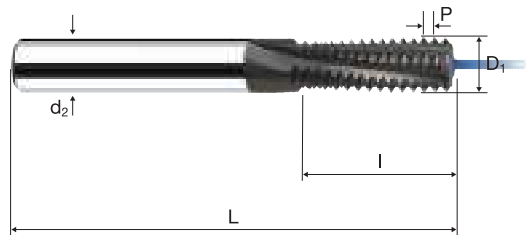
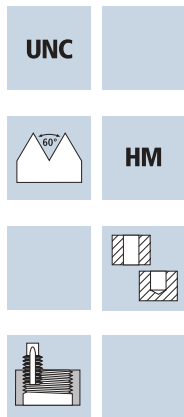


Stainless steel
[Cr-Ni/1.4301]



UNC	D ₁ [mm]	P(TPI)	z	v _c [m/min]	f _z [mm]	n [min ⁻¹]	v _{fc} [mm/min]	v _f [mm/min]
Nr.10	3.40	24.0	3	90	0.0160	8425	119	404
Nr.12	4.10	24.0	3	90	0.0200	6985	106	419
1/4	4.70	20.0	3	90	0.0240	6095	114	439
5/16	6.10	18.0	3	90	0.0280	4695	91	394
3/8	7.60	16.0	3	90	0.0360	3770	82	407
7/16	9.00	14.0	3	90	0.0440	3185	80	420
1/2	9.95	13.0	4	90	0.0480	2880	120	553
9/16	11.40	12.0	4	90	0.0480	2515	98	483
5/8	12.70	11.0	4	90	0.0480	2255	87	433
Nr.10	3.40	24.0	3	80	0.0160	7490	106	360
Nr.12	4.10	24.0	3	80	0.0200	6210	94	373
1/4	4.70	20.0	3	80	0.0240	5420	101	390
5/16	6.10	18.0	3	80	0.0280	4175	81	351
3/8	7.60	16.0	3	80	0.0360	3350	73	362
7/16	9.00	14.0	3	80	0.0440	2830	71	374
1/2	9.95	13.0	4	80	0.0480	2560	106	492
9/16	11.40	12.0	4	80	0.0480	2235	87	429
5/8	12.70	11.0	4	80	0.0480	2005	77	385
Nr.10	3.40	24.0	3	60	0.0160	5615	80	270
Nr.12	4.10	24.0	3	60	0.0200	4660	71	280
1/4	4.70	20.0	3	60	0.0240	4065	76	293
5/16	6.10	18.0	3	60	0.0240	3130	52	225
3/8	7.60	16.0	3	60	0.0320	2515	49	241
7/16	9.00	14.0	3	60	0.0400	2120	48	254
1/2	9.95	13.0	4	60	0.0440	1920	73	338
9/16	11.40	12.0	4	60	0.0440	1675	60	295
5/8	12.70	11.0	4	60	0.0480	1505	58	289
Nr.10	3.40	24.0	3	45	0.0160	4215	60	202
Nr.12	4.10	24.0	3	45	0.0200	3495	53	210
1/4	4.70	20.0	3	45	0.0240	3050	57	220
5/16	6.10	18.0	3	45	0.0240	2350	39	169
3/8	7.60	16.0	3	45	0.0320	1885	37	181
7/16	9.00	14.0	3	45	0.0400	1590	36	191
1/2	9.95	13.0	4	45	0.0440	1440	55	253
9/16	11.40	12.0	4	45	0.0440	1255	45	221
5/8	12.70	11.0	4	45	0.0480	1130	43	217
Nr.10	3.40	24.0	3	150	0.0280	14045	349	1180
Nr.12	4.10	24.0	3	150	0.0320	11645	282	1118
1/4	4.70	20.0	3	150	0.0360	10160	285	1097
5/16	6.10	18.0	3	150	0.0400	7825	217	939
3/8	7.60	16.0	3	150	0.0440	6280	168	829
7/16	9.00	14.0	3	150	0.0520	5305	157	828
1/2	9.95	13.0	4	150	0.0560	4800	233	1075
9/16	11.40	12.0	4	150	0.0560	4190	190	939
5/8	12.70	11.0	4	150	0.0640	3760	193	963
Nr.10	3.40	24.0	3	120	0.0200	11235	199	674
Nr.12	4.10	24.0	3	120	0.0240	9315	169	671
1/4	4.70	20.0	3	120	0.0280	8125	177	683
5/16	6.10	18.0	3	120	0.0320	6260	139	601
3/8	7.60	16.0	3	120	0.0360	5025	110	543
7/16	9.00	14.0	3	120	0.0480	4245	116	611
1/2	9.95	13.0	4	120	0.0520	3840	173	799
9/16	11.40	12.0	4	120	0.0520	3350	141	697
5/8	12.70	11.0	4	120	0.0560	3010	135	674
Nr.10	3.40	24.0	3	130	0.0200	12170	216	730
Nr.12	4.10	24.0	3	130	0.0240	10095	184	727
1/4	4.70	20.0	3	130	0.0280	8805	192	740
5/16	6.10	18.0	3	130	0.0320	6785	151	651
3/8	7.60	16.0	3	130	0.0360	5445	119	588
7/16	9.00	14.0	3	130	0.0480	4600	126	662
1/2	9.95	13.0	4	130	0.0520	4160	187	865
9/16	11.40	12.0	4	130	0.0520	3630	153	755
5/8	12.70	11.0	4	130	0.0560	3260	146	730
Nr.10	3.40	24.0	3	55	0.0200	5150	91	309
Nr.12	4.10	24.0	3	55	0.0240	4270	78	307
1/4	4.70	20.0	3	55	0.0240	3725	70	268
5/16	6.10	18.0	3	55	0.0240	2870	48	207
3/8	7.60	16.0	3	55	0.0280	2305	39	194
7/16	9.00	14.0	3	55	0.0400	1945	44	233
1/2	9.95	13.0	4	55	0.0440	1760	67	310
9/16	11.40	12.0	4	55	0.0440	1535	55	270
5/8	12.70	11.0	4	55	0.0480	1380	53	265

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TM

Rm <850 HRC < 24	Rm 850-1100 HRC 24-34	Rm 1100-1300 HRC 34-42	Rm 1300-1500 HRC 42-48	HRC 48-56			Inox Stainless	Ti Titanium	Aluminium / Copper GG(G)
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[illegible]

Application



Material

Steel
< 850 N/mm²



Steel
850 - 1100 N/mm²



Steel
1100 - 1300 N/mm²



Steel
1300 - 1500 N/mm²



Wrought aluminium
alloys
Si < 6%
hardened



Cast iron
(lamellar / spheroidal)



Unalloyed copper

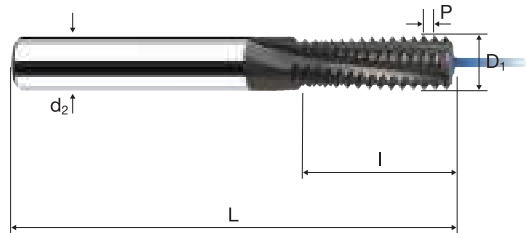
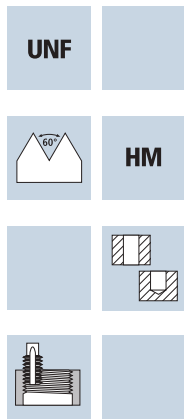


Stainless steel
[Cr-Ni/1.4301]



UNF	D ₁ [mm]	P(TPI)	z	v _c [m/min]	f _z [mm]	n [min ⁻¹]	v _{fc} [mm/min]	v _f [mm/min]
Nr.10	3.80	32.0	3	90	0.0200	7540	96	452
Nr.12	4.30	28.0	3	90	0.0200	6660	86	400
1/4	5.10	28.0	3	90	0.0240	5615	80	404
5/16	6.30	24.0	3	90	0.0280	4545	79	382
3/8	7.80	24.0	3	90	0.0400	3675	80	441
7/16	9.40	20.0	3	90	0.0440	3050	62	403
1/2	9.95	20.0	4	90	0.0480	2880	120	553
9/16	11.40	18.0	4	90	0.0480	2515	98	483
5/8	12.70	18.0	4	90	0.0480	2255	87	433
Nr.10	3.80	32.0	3	80	0.0200	6700	85	402
Nr.12	4.30	28.0	3	80	0.0200	5920	77	355
1/4	5.10	28.0	3	80	0.0240	4995	71	360
5/16	6.30	24.0	3	80	0.0280	4040	70	339
3/8	7.80	24.0	3	80	0.0400	3265	71	392
7/16	9.40	20.0	3	80	0.0440	2710	55	358
1/2	9.95	20.0	4	80	0.0480	2560	106	492
9/16	11.40	18.0	4	80	0.0480	2235	87	429
5/8	12.70	18.0	4	80	0.0480	2005	77	385
Nr.10	3.80	32.0	3	60	0.0200	5025	64	302
Nr.12	4.30	28.0	3	60	0.0200	4440	58	266
1/4	5.10	28.0	3	60	0.0240	3745	53	270
5/16	6.30	24.0	3	60	0.0240	3030	45	218
3/8	7.80	24.0	3	60	0.0320	2450	43	235
7/16	9.40	20.0	3	60	0.0400	2030	38	244
1/2	9.95	20.0	4	60	0.0440	1920	73	338
9/16	11.40	18.0	4	60	0.0440	1675	60	295
5/8	12.70	18.0	4	60	0.0480	1505	58	289
Nr.10	3.80	32.0	3	45	0.0200	3770	48	226
Nr.12	4.30	28.0	3	45	0.0200	3330	43	200
1/4	5.10	28.0	3	45	0.0240	2810	40	202
5/16	6.30	24.0	3	45	0.0240	2275	34	164
3/8	7.80	24.0	3	45	0.0320	1835	32	176
7/16	9.40	20.0	3	45	0.0400	1525	28	183
1/2	9.95	20.0	4	45	0.0440	1440	55	253
9/16	11.40	18.0	4	45	0.0440	1255	45	221
5/8	12.70	18.0	4	45	0.0480	1130	43	217
Nr.10	3.80	32.0	3	150	0.0320	12565	256	1206
Nr.12	4.30	28.0	3	150	0.0320	11105	230	1066
1/4	5.10	28.0	3	150	0.0360	9360	199	1011
5/16	6.30	24.0	3	150	0.0400	7580	188	910
3/8	7.80	24.0	3	150	0.0480	6120	160	881
7/16	9.40	20.0	3	150	0.0520	5080	122	793
1/2	9.95	20.0	4	150	0.0560	4800	233	1075
9/16	11.40	18.0	4	150	0.0560	4190	190	939
5/8	12.70	18.0	4	150	0.0640	3760	193	963
Nr.10	3.80	32.0	3	120	0.0240	10050	154	724
Nr.12	4.30	28.0	3	120	0.0240	8885	138	640
1/4	5.10	28.0	3	120	0.0280	7490	124	629
5/16	6.30	24.0	3	120	0.0320	6065	120	582
3/8	7.80	24.0	3	120	0.0400	4895	106	587
7/16	9.40	20.0	3	120	0.0480	4065	90	585
1/2	9.95	20.0	4	120	0.0520	3840	173	799
9/16	11.40	18.0	4	120	0.0520	3350	141	697
5/8	12.70	18.0	4	120	0.0560	3010	135	674
Nr.10	3.80	32.0	3	130	0.0240	10890	167	784
Nr.12	4.30	28.0	3	130	0.0240	9625	150	693
1/4	5.10	28.0	3	130	0.0280	8115	134	682
5/16	6.30	24.0	3	130	0.0320	6570	130	631
3/8	7.80	24.0	3	130	0.0400	5305	115	637
7/16	9.40	20.0	3	130	0.0480	4400	98	634
1/2	9.95	20.0	4	130	0.0520	4160	187	865
9/16	11.40	18.0	4	130	0.0520	3630	153	755
5/8	12.70	18.0	4	130	0.0560	3260	146	730
Nr.10	3.80	32.0	3	55	0.0240	4605	70	332
Nr.12	4.30	28.0	3	55	0.0240	4070	63	293
1/4	5.10	28.0	3	55	0.0240	3435	49	247
5/16	6.30	24.0	3	55	0.0240	2780	41	200
3/8	7.80	24.0	3	55	0.0320	2245	39	216
7/16	9.40	20.0	3	55	0.0400	1860	34	223
1/2	9.95	20.0	4	55	0.0440	1760	67	310
9/16	11.40	18.0	4	55	0.0440	1535	55	270
5/8	12.70	18.0	4	55	0.0480	1380	53	265

2xd, Incool



TM

Rm <850 HRC < 24	Rm 850-1100 HRC 24-34	Rm 1100-1300 HRC 34-42	Rm 1300-1500 HRC 42-48	HRC 48-56			Inox Stainless	Ti Titanium	Aluminium / Copper GG(G)
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[illegible]

Application



Material

Steel
< 850 N/mm²



Steel
850 - 1100 N/mm²



Steel
1100 - 1300 N/mm²



Steel
1300 - 1500 N/mm²



Wrought aluminium
alloys
Si < 6%
hardened



Cast iron
(lamellar / spheroidal)



Unalloyed copper

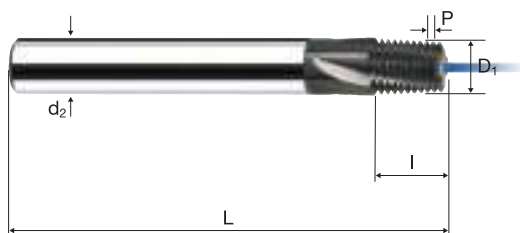
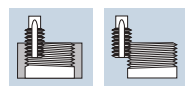
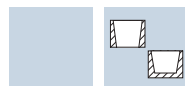


Stainless steel
[Cr-Ni/1.4301]



NPT	D ₁ [mm]	P(TPI)	z	v _c [m/min]	f _z [mm]	n [min ⁻¹]	v _{fc} [mm/min]	v _f [mm/min]
1/16	5.90	27.0	3	90	0.0240	4855	98	350
1/8	7.30	27.0	3	90	0.0360	3925	133	424
1/4	9.95	18.0	4	90	0.0440	2880	150	507
3/8	12.50	18.0	4	90	0.0480	2290	127	440
≥1/2	14.50	14.0	5	90	0.0520	1975	174	514
≥1	18.50	11.5	5	90	0.0560	1550	199	434
1/16	5.90	27.0	3	80	0.0240	4315	87	311
1/8	7.30	27.0	3	80	0.0360	3490	118	377
1/4	9.95	18.0	4	80	0.0440	2560	134	451
3/8	12.50	18.0	4	80	0.0480	2035	113	391
≥1/2	14.50	14.0	5	80	0.0520	1755	154	456
≥1	18.50	11.5	5	80	0.0560	1375	177	385
1/16	5.90	27.0	3	60	0.0240	3235	65	233
1/8	7.30	27.0	3	60	0.0280	2615	69	220
1/4	9.95	18.0	4	60	0.0400	1920	91	307
3/8	12.50	18.0	4	60	0.0480	1530	85	294
≥1/2	14.50	14.0	5	60	0.0520	1315	116	342
≥1	18.50	11.5	5	60	0.0560	1030	132	288
1/16	5.90	27.0	3	45	0.0240	2430	49	175
1/8	7.30	27.0	3	45	0.0280	1960	51	165
1/4	9.95	18.0	4	45	0.0400	1440	68	230
3/8	12.50	18.0	4	45	0.0480	1145	63	220
≥1/2	14.50	14.0	5	45	0.0520	990	87	257
≥1	18.50	11.5	5	45	0.0560	775	100	217
1/16	5.90	27.0	3	150	0.0360	8095	244	874
1/8	7.30	27.0	3	150	0.0440	6540	270	863
1/4	9.95	18.0	4	150	0.0520	4800	296	998
3/8	12.50	18.0	4	150	0.0640	3820	282	978
≥1/2	14.50	14.0	5	150	0.0680	3295	379	1120
≥1	18.50	11.5	5	150	0.0800	2580	473	1032
1/16	5.90	27.0	3	120	0.0280	6475	152	544
1/8	7.30	27.0	3	120	0.0360	5230	177	565
1/4	9.95	18.0	4	120	0.0480	3840	218	737
3/8	12.50	18.0	4	120	0.0560	3055	197	684
≥1/2	14.50	14.0	5	120	0.0640	2635	285	843
≥1	18.50	11.5	5	120	0.0800	2065	379	826
1/16	5.90	27.0	3	130	0.0280	7015	165	589
1/8	7.30	27.0	3	130	0.0360	5670	191	612
1/4	9.95	18.0	4	130	0.0480	4160	237	799
3/8	12.50	18.0	4	130	0.0560	3310	214	741
≥1/2	14.50	14.0	5	130	0.0640	2855	309	914
≥1	18.50	11.5	5	130	0.0800	2235	410	894
1/16	5.90	27.0	3	55	0.0240	2965	60	214
1/8	7.30	27.0	3	55	0.0280	2400	63	202
1/4	9.95	18.0	4	55	0.0400	1760	83	282
3/8	12.50	18.0	4	55	0.0480	1400	78	269
≥1/2	14.50	14.0	5	55	0.0520	1205	106	313
≥1	18.50	11.5	5	55	0.0560	945	121	265

Incool



TM

Rm ≤ 850 HRC ≤ 24	Rm 850-1100 HRC 24-34	Rm 1100-1300 HRC 34-42	Rm 1300-1500 HRC 42-48	HRC 48-56			Inox Stainless	Ti Titanium	Aluminium / Copper GG(G)
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[illegible]

Application



Material

Steel
< 850 N/mm²



Steel
850 - 1100 N/mm²



Steel
1100 - 1300 N/mm²



Steel
1300 - 1500 N/mm²



Wrought aluminium
alloys
Si < 6%
hardened



Cast iron
(lamellar / spheroidal)



Unalloyed copper

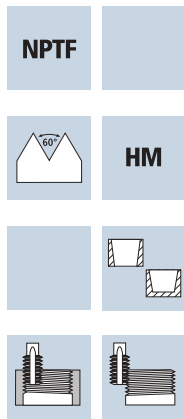


Stainless steel
[Cr-Ni/1.4301]



NPTF	D ₁ [mm]	P(TPI)	z	v _c [m/min]	f _z [mm]	n [min ⁻¹]	v _{fc} [mm/min]	v _f [mm/min]
1/16	5.90	27.0	3	90	0.0240	4855	98	350
1/8	7.30	27.0	3	90	0.0360	3925	133	424
1/4	9.95	18.0	4	90	0.0440	2880	150	507
3/8	12.50	18.0	4	90	0.0480	2290	127	440
≥1/2	14.50	14.0	5	90	0.0520	1975	174	514
≥1	18.50	11.5	5	90	0.0560	1550	199	434
1/16	5.90	27.0	3	80	0.0240	4315	87	311
1/8	7.30	27.0	3	80	0.0360	3490	118	377
1/4	9.95	18.0	4	80	0.0440	2560	134	451
3/8	12.50	18.0	4	80	0.0480	2035	113	391
≥1/2	14.50	14.0	5	80	0.0520	1755	154	456
≥1	18.50	11.5	5	80	0.0560	1375	177	385
1/16	5.90	27.0	3	60	0.0240	3235	65	233
1/8	7.30	27.0	3	60	0.0280	2615	69	220
1/4	9.95	18.0	4	60	0.0400	1920	91	307
3/8	12.50	18.0	4	60	0.0480	1530	85	294
≥1/2	14.50	14.0	5	60	0.0520	1315	116	342
≥1	18.50	11.5	5	60	0.0560	1030	132	288
1/16	5.90	27.0	3	45	0.0240	2430	49	175
1/8	7.30	27.0	3	45	0.0280	1960	51	165
1/4	9.95	18.0	4	45	0.0400	1440	68	230
3/8	12.50	18.0	4	45	0.0480	1145	63	220
≥1/2	14.50	14.0	5	45	0.0520	990	87	257
≥1	18.50	11.5	5	45	0.0560	775	100	217
1/16	5.90	27.0	3	150	0.0360	8095	244	874
1/8	7.30	27.0	3	150	0.0440	6540	270	863
1/4	9.95	18.0	4	150	0.0520	4800	296	998
3/8	12.50	18.0	4	150	0.0640	3820	282	978
≥1/2	14.50	14.0	5	150	0.0680	3295	379	1120
≥1	18.50	11.5	5	150	0.0800	2580	473	1032
1/16	5.90	27.0	3	120	0.0280	6475	152	544
1/8	7.30	27.0	3	120	0.0360	5230	177	565
1/4	9.95	18.0	4	120	0.0480	3840	218	737
3/8	12.50	18.0	4	120	0.0560	3055	197	684
≥1/2	14.50	14.0	5	120	0.0640	2635	285	843
≥1	18.50	11.5	5	120	0.0800	2065	379	826
1/16	5.90	27.0	3	130	0.0280	7015	165	589
1/8	7.30	27.0	3	130	0.0360	5670	191	612
1/4	9.95	18.0	4	130	0.0480	4160	237	799
3/8	12.50	18.0	4	130	0.0560	3310	214	741
≥1/2	14.50	14.0	5	130	0.0640	2855	309	914
≥1	18.50	11.5	5	130	0.0800	2235	410	894
1/16	5.90	27.0	3	55	0.0240	2965	60	214
1/8	7.30	27.0	3	55	0.0280	2400	63	202
1/4	9.95	18.0	4	55	0.0400	1760	83	282
3/8	12.50	18.0	4	55	0.0480	1400	78	269
≥1/2	14.50	14.0	5	55	0.0520	1205	106	313
≥1	18.50	11.5	5	55	0.0560	945	121	265

Incool



TM

Rm <850 HRC < 24	Rm 850-1100 HRC 24-34	Rm 1100-1300 HRC 34-42	Rm 1300-1500 HRC 42-48	HRC 48-56			Inox Stainless	Ti Titanium	Aluminium / Copper GG(G)
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[illegible]

Application



Material

Steel
850 - 1100 N/mm²



Steel
1300 - 1500 N/mm²



Hardened tool steel
48 - 52 HRC



Stainless steel
[Cr-Ni/1.4301]



Cast iron
(lamellar / spheroidal)



Wrought aluminium
alloys
Si < 6%
hardened



Cast aluminium

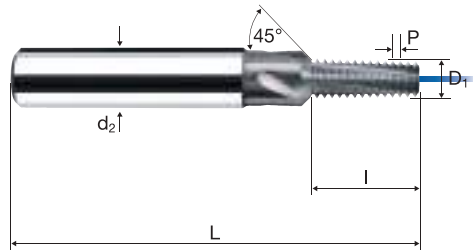
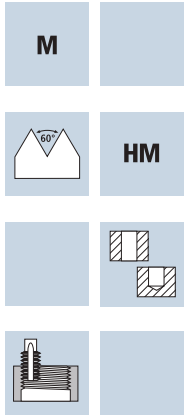


Titanium alloys
> 300 HB
[Ti6Al4V]



M	D ₁ [mm]	P [mm]	z	v _c [m/min]	f _z [mm]	L _K [mm]	n [min ⁻¹]	v _K [mm/min]	v _f [mm/min]
M 3	2.30	0.50	3	80	0.0055	7.2	11070	43	183
M 4	3.00	0.70	3	80	0.0070	9.4	8490	45	178
M 5	4.00	0.80	3	80	0.0090	11.4	6365	34	172
M 6	4.80	1.00	3	80	0.0110	14.3	5305	35	175
M 8	6.40	1.25	3	80	0.0145	19.1	3980	35	173
M 10	7.95	1.50	4	80	0.0180	23.1	3205	47	231
M 12	9.95	1.75	4	80	0.0225	26.7	2560	39	230
M 16	12.80	2.00	4	80	0.0290	37.0	1990	46	231
M 3	2.30	0.50	3	50	0.0045	7.2	6920	22	93
M 4	3.00	0.70	3	50	0.0060	9.4	5305	24	96
M 5	4.00	0.80	3	50	0.0080	11.4	3980	19	96
M 6	4.80	1.00	3	50	0.0095	14.3	3315	19	95
M 8	6.40	1.25	3	50	0.0125	19.1	2485	19	93
M 10	7.95	1.50	4	50	0.0160	23.1	2000	26	128
M 12	9.95	1.75	4	50	0.0200	26.7	1600	22	128
M 16	12.80	2.00	4	50	0.0255	37.0	1245	25	127
M 3	2.30	0.50	3	30	0.0035	7.2	4150	10	44
M 4	3.00	0.70	3	30	0.0045	9.4	3185	11	43
M 5	4.00	0.80	3	30	0.0060	11.4	2385	9	43
M 6	4.80	1.00	3	30	0.0070	14.3	1990	8	42
M 8	6.40	1.25	3	30	0.0095	19.1	1490	9	43
M 10	7.95	1.50	4	30	0.0120	23.1	1200	12	58
M 12	9.95	1.75	4	30	0.0150	26.7	960	10	58
M 16	12.80	2.00	4	30	0.0195	37.0	745	12	58
M 3	2.30	0.50	3	50	0.0035	7.2	6920	17	73
M 4	3.00	0.70	3	50	0.0045	9.4	5305	18	72
M 5	4.00	0.80	3	50	0.0060	11.4	3980	14	72
M 6	4.80	1.00	3	50	0.0070	14.3	3315	14	70
M 8	6.40	1.25	3	50	0.0095	19.1	2485	14	71
M 10	7.95	1.50	4	50	0.0120	23.1	2000	20	96
M 12	9.95	1.75	4	50	0.0150	26.7	1600	16	96
M 16	12.80	2.00	4	50	0.0195	37.0	1245	19	97
M 3	2.30	0.50	3	120	0.0055	7.2	16605	64	274
M 4	3.00	0.70	3	120	0.0070	9.4	12730	67	267
M 5	4.00	0.80	3	120	0.0090	11.4	9550	52	258
M 6	4.80	1.00	3	120	0.0110	14.3	7960	53	263
M 8	6.40	1.25	3	120	0.0145	19.1	5970	52	260
M 10	7.95	1.50	4	120	0.0180	23.1	4805	71	346
M 12	9.95	1.75	4	120	0.0225	26.7	3840	59	346
M 16	12.80	2.00	4	120	0.0290	37.0	2985	69	346
M 3	2.30	0.50	3	150	0.0070	7.2	20760	102	436
M 4	3.00	0.70	3	150	0.0095	9.4	15915	113	454
M 5	4.00	0.80	3	150	0.0125	11.4	11935	90	448
M 6	4.80	1.00	3	150	0.0155	14.3	9945	92	462
M 8	6.40	1.25	3	150	0.0205	19.1	7460	92	459
M 10	7.95	1.50	4	150	0.0250	23.1	6005	123	601
M 12	9.95	1.75	4	150	0.0315	26.7	4800	103	605
M 16	12.80	2.00	4	150	0.0405	37.0	3730	121	604
M 3	2.30	0.50	3	200	0.0070	7.2	27680	136	581
M 4	3.00	0.70	3	200	0.0095	9.4	21220	151	605
M 5	4.00	0.80	3	200	0.0125	11.4	15915	119	597
M 6	4.80	1.00	3	200	0.0155	14.3	13265	123	617
M 8	6.40	1.25	3	200	0.0205	19.1	9945	122	612
M 10	7.95	1.50	4	200	0.0250	23.1	8010	164	801
M 12	9.95	1.75	4	200	0.0315	26.7	6400	138	806
M 16	12.80	2.00	4	200	0.0405	37.0	4975	161	806
M 3	2.30	0.50	3	40	0.0035	7.2	5535	14	58
M 4	3.00	0.70	3	40	0.0045	9.4	4245	14	57
M 5	4.00	0.80	3	40	0.0060	11.4	3185	11	57
M 6	4.80	1.00	3	40	0.0070	14.3	2655	11	56
M 8	6.40	1.25	3	40	0.0095	19.1	1990	11	57
M 10	7.95	1.50	4	40	0.0120	23.1	1600	16	77
M 12	9.95	1.75	4	40	0.0150	26.7	1280	13	77
M 16	12.80	2.00	4	40	0.0195	37.0	995	16	78

2xd, chamfer 45°, Incool



TM

Rm <850 HRC <24	Rm 850-1100 HRC 24-34	Rm 1100-1300 HRC 34-42	Rm 1300-1500 HRC 42-48	HRC 48-56				Inox Stainless	Ti Titanium	Aluminium / Copper GG(G)
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[illegible]

Application



Material

Steel
850 - 1100 N/mm²



Steel
850 - 1100 N/mm²



Steel
1300 - 1500 N/mm²



Steel
1300 - 1500 N/mm²



Wrought aluminium
alloys
Si < 6%
hardened



Wrought aluminium
alloys
Si < 6%
hardened



Cast iron
(lamellar / spheroidal)

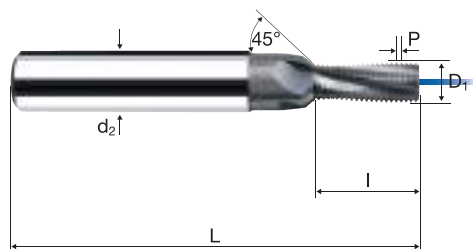


Cast iron
(lamellar / spheroidal)



MF	D ₁ [mm]	P [mm]	z	v _c [m/min]	f _z [mm]	L _K [mm]	n [min ⁻¹]	v _K [mm/min]	v _f [mm/min]
M 4	3.00	0.50	3	80	0.0070	9.4	8490	45	178
M 5	4.00	0.50	3	80	0.0090	11.4	6365	34	172
M 6	4.80	0.50	3	80	0.0110	13.6	5305	35	175
M 6	4.80	0.75	3	80	0.0110	13.9	5305	35	175
M 8	6.40	0.75	3	80	0.0145	17.9	3980	35	173
M 8	6.40	1.00	3	80	0.0145	18.5	3980	35	173
M 10	7.95	1.00	4	80	0.0180	22.8	3205	47	231
M 10	7.95	1.25	4	80	0.0180	23.2	3205	47	231
M 12	9.95	1.00	4	80	0.0225	26.8	2560	39	230
M 12	9.95	1.50	4	80	0.0225	27.6	2560	39	230
M 14	11.20	1.50	4	80	0.0250	32.6	2275	46	228
M 16	12.80	1.50	4	80	0.0290	35.8	1990	46	231
M 4	3.00	0.50	3	50	0.0060	9.4	5305	24	96
M 5	4.00	0.50	3	50	0.0080	11.4	3980	19	96
M 6	4.80	0.50	3	50	0.0095	13.6	3315	19	95
M 6	4.80	0.75	3	50	0.0095	13.9	3315	19	95
M 8	6.40	0.75	3	50	0.0125	17.9	2485	19	93
M 8	6.40	1.00	3	50	0.0125	18.5	2485	19	93
M 10	7.95	1.00	4	50	0.0160	22.8	2000	26	128
M 10	7.95	1.25	4	50	0.0160	23.2	2000	26	128
M 12	9.95	1.00	4	50	0.0200	26.8	1600	22	128
M 12	9.95	1.50	4	50	0.0200	27.6	1600	22	128
M 14	11.20	1.50	4	50	0.0225	32.6	1420	26	128
M 16	12.80	1.50	4	50	0.0255	35.8	1245	25	127
M 4	3.00	0.50	3	150	0.0095	9.4	15915	113	454
M 5	4.00	0.50	3	150	0.0125	11.4	11935	90	448
M 6	4.80	0.50	3	150	0.0155	13.6	9945	92	462
M 6	4.80	0.75	3	150	0.0155	13.9	9945	92	462
M 8	6.40	0.75	3	150	0.0205	17.9	7460	92	459
M 8	6.40	1.00	3	150	0.0205	18.5	7460	92	459
M 10	7.95	1.00	4	150	0.0250	22.8	6005	123	601
M 10	7.95	1.25	4	150	0.0250	23.2	6005	123	601
M 12	9.95	1.00	4	150	0.0315	26.8	4800	103	605
M 12	9.95	1.50	4	150	0.0315	27.6	4800	103	605
M 14	11.20	1.50	4	150	0.0355	32.6	4265	121	606
M 16	12.80	1.50	4	150	0.0405	35.8	3730	121	604
M 4	3.00	0.50	3	120	0.0070	9.4	12730	67	267
M 5	4.00	0.50	3	120	0.0090	11.4	9550	52	258
M 6	4.80	0.50	3	120	0.0110	13.6	7960	53	263
M 6	4.80	0.75	3	120	0.0110	13.9	7960	53	263
M 8	6.40	0.75	3	120	0.0145	17.9	5970	52	260
M 8	6.40	1.00	3	120	0.0145	18.5	5970	52	260
M 10	7.95	1.00	4	120	0.0180	22.8	4805	71	346
M 10	7.95	1.25	4	120	0.0180	23.2	4805	71	346
M 12	9.95	1.00	4	120	0.0225	26.8	3840	59	346
M 12	9.95	1.50	4	120	0.0225	27.6	3840	59	346
M 14	11.20	1.50	4	120	0.0250	32.6	3410	68	341
M 16	12.80	1.50	4	120	0.0290	35.8	2985	69	346

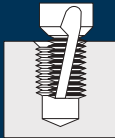
2xd, chamfer 45°, Incool



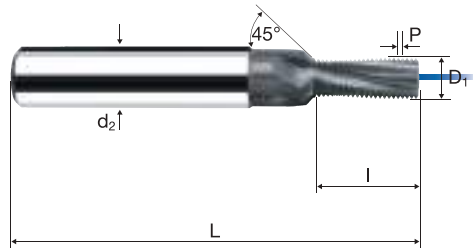
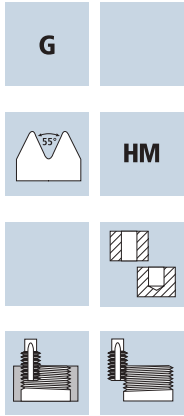
TM

Rm <850 HRC < 24	Rm 850-1100 HRC 24-34	Rm 1100-1300 HRC 34-42	Rm 1300-1500 HRC 42-48				Inox Stainless	Ti Titanium	Aluminium / Copper GG(G)
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[illegible]

Application	Material	G	D ₁ [mm]	P(TPI)	z	v _c [m/min]	f _z [mm]	L _K [mm]	n [min ⁻¹]	v _{fc} [mm/min]	v _f [mm/min]
	Steel 850 - 1100 N/mm ² 	G 1/8	7.95	28.0	4	80	0.0180	22.4	3205	42	231
		G 1/4	9.95	19.0	4	80	0.0240	30.4	2560	60	246
		G 3/8	13.60	19.0	4	80	0.0310	37.3	1870	43	232
	Steel 1300 - 1500 N/mm ² 	G 1/8	7.95	28.0	4	50	0.0160	22.4	2000	23	128
		G 1/4	9.95	19.0	4	50	0.0210	30.4	1600	33	134
		G 3/8	13.60	19.0	4	50	0.0275	37.3	1170	24	129
	Hardened tool steel 48 - 52 HRC 	G 1/8	7.95	28.0	4	30	0.0120	22.4	1200	11	58
		G 1/4	9.95	19.0	4	30	0.0160	30.4	960	15	61
		G 3/8	13.60	19.0	4	30	0.0205	37.3	700	11	57
	Stainless steel [Cr-Ni/1.4301] 	G 1/8	7.95	28.0	4	50	0.0120	22.4	2000	18	96
		G 1/4	9.95	19.0	4	50	0.0160	30.4	1600	25	102
		G 3/8	13.60	19.0	4	50	0.0205	37.3	1170	18	96
	Cast iron (lamellar / spheroidal) 	G 1/8	7.95	28.0	4	120	0.0180	22.4	4805	63	346
		G 1/4	9.95	19.0	4	120	0.0240	30.4	3840	90	369
		G 3/8	13.60	19.0	4	120	0.0310	37.3	2810	64	348
	Wrought aluminium alloys Si < 6% hardened 	G 1/8	7.95	28.0	4	150	0.0250	22.4	6005	110	601
		G 1/4	9.95	19.0	4	150	0.0335	30.4	4800	157	643
		G 3/8	13.60	19.0	4	150	0.0430	37.3	3510	111	604
	Cast aluminium 	G 1/8	7.95	28.0	4	200	0.0250	22.4	8010	146	801
		G 1/4	9.95	19.0	4	200	0.0335	30.4	6400	209	858
		G 3/8	13.60	19.0	4	200	0.0430	37.3	4680	148	805
	Titanium alloys > 300 HB [Ti6Al4V] 	G 1/8	7.95	28.0	4	40	0.0120	22.4	1600	14	77
		G 1/4	9.95	19.0	4	40	0.0160	30.4	1280	20	82
		G 3/8	13.60	19.0	4	40	0.0205	37.3	935	14	77

2xd, chamfer 45°, Incool



TM

Rm <850 HRC <24	Rm 850-1100 HRC 24-34	Rm 1100-1300 HRC 34-42	Rm 1300-1500 HRC 42-48	HRC 48-56				Inox Stainless	Ti Titanium	Aluminium / Copper GG(G)
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[illegible]

Application

Material



Steel
850 - 1100 N/mm²



Steel
1300 - 1500 N/mm²



Hardened tool steel
48 - 52 HRC



Stainless steel
[Cr-Ni/1.4301]



Cast iron
(lamellar / spheroidal)



Wrought aluminium alloys
Si < 6%
hardened



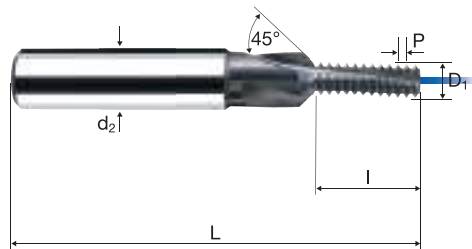
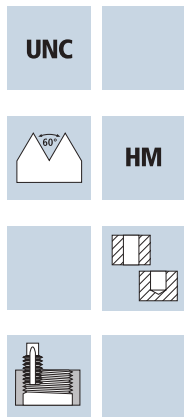
Cast aluminium



Titanium alloys
> 300 HB
[Ti6Al4V]

[illegible]

2xd, chamfer 45°, Incool



TM

Rm <850 HRC < 24	Rm 850-1100 HRC 24-34	Rm 1100-1300 HRC 34-42	Rm 1300-1500 HRC 42-48	HRC 48-56			Inox Stainless	Ti Titanium	Aluminium / Copper GG(G)
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[illegible]

Application

Material



Steel
850 - 1100 N/mm²



Steel
1300 - 1500 N/mm²



Hardened tool steel
48 - 52 HRC



Stainless steel
[Cr-Ni/1.4301]



Cast iron
(lamellar / spheroidal)



Wrought aluminium alloys
Si < 6%
hardened



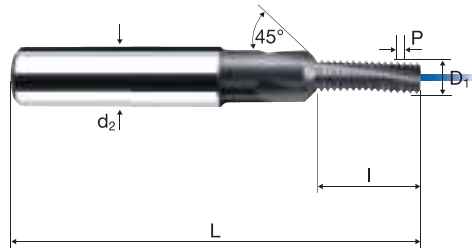
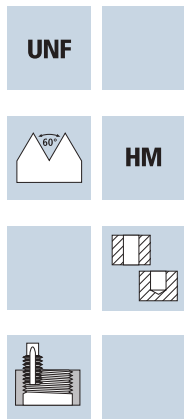
Cast aluminium



Titanium alloys
> 300 HB
[Ti6Al4V]

[illegible]

2xd, chamfer 45°, Incool



TM

Rm <850 HRC < 24	Rm 850-1100 HRC 24-34	Rm 1100-1300 HRC 34-42	Rm 1300-1500 HRC 42-48	HRC 48-56			Inox Stainless	Ti Titanium	Aluminium / Copper GG(G)
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[illegible]

Application



Material

Steel
850 - 1100 N/mm²



Steel
1300 - 1500 N/mm²



Hardened tool steel
48 - 52 HRC



Stainless steel
[Cr-Ni/1.4301]



Cast iron
(lamellar / spheroidal)



Wrought aluminium
alloys
Si < 6%
hardened



Cast aluminium

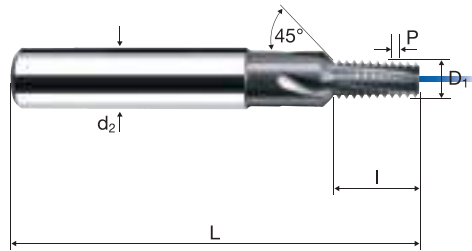
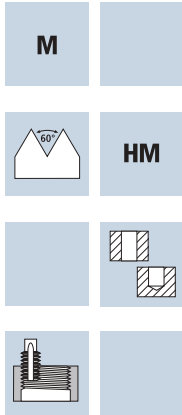


Titanium alloys
> 300 HB
[Ti6Al4V]



M	D ₁ [mm]	P [mm]	z	v _c [m/min]	f _z [mm]	L _K [mm]	n [min ⁻¹]	v _{fc} [mm/min]	v _f [mm/min]
M 3	2.30	0.50	3	80	0.0060	5.7	11070	47	199
M 4	3.00	0.70	3	80	0.0075	8.0	8490	48	191
M 5	4.00	0.80	3	80	0.0100	9.8	6365	38	191
M 6	4.80	1.00	3	80	0.0120	11.3	5305	38	191
M 8	6.40	1.25	3	80	0.0160	14.1	3980	38	191
M 10	7.95	1.50	4	80	0.0200	18.6	3205	53	256
M 12	9.95	1.75	4	80	0.0250	21.4	2560	44	256
M 16	12.80	2.00	4	80	0.0320	29.0	1990	51	255
M 3	2.30	0.50	3	50	0.0050	5.7	6920	24	104
M 4	3.00	0.70	3	50	0.0065	8.0	5305	26	103
M 5	4.00	0.80	3	50	0.0090	9.8	3980	22	108
M 6	4.80	1.00	3	50	0.0105	11.3	3315	21	104
M 8	6.40	1.25	3	50	0.0140	14.1	2485	21	104
M 10	7.95	1.50	4	50	0.0175	18.6	2000	29	140
M 12	9.95	1.75	4	50	0.0220	21.4	1600	24	141
M 16	12.80	2.00	4	50	0.0285	29.0	1245	28	142
M 3	2.30	0.50	3	30	0.0040	5.7	4150	12	50
M 4	3.00	0.70	3	30	0.0050	8.0	3185	12	48
M 5	4.00	0.80	3	30	0.0065	9.8	2385	9	47
M 6	4.80	1.00	3	30	0.0080	11.3	1990	10	48
M 8	6.40	1.25	3	30	0.0105	14.1	1490	9	47
M 10	7.95	1.50	4	30	0.0135	18.6	1200	13	65
M 12	9.95	1.75	4	30	0.0165	21.4	960	11	63
M 16	12.80	2.00	4	30	0.0215	29.0	745	13	64
M 3	2.30	0.50	3	50	0.0040	5.7	6920	19	83
M 4	3.00	0.70	3	50	0.0050	8.0	5305	20	80
M 5	4.00	0.80	3	50	0.0065	9.8	3980	16	78
M 6	4.80	1.00	3	50	0.0080	11.3	3315	16	80
M 8	6.40	1.25	3	50	0.0105	14.1	2485	16	78
M 10	7.95	1.50	4	50	0.0135	18.6	2000	22	108
M 12	9.95	1.75	4	50	0.0165	21.4	1600	18	106
M 16	12.80	2.00	4	50	0.0215	29.0	1245	21	107
M 3	2.30	0.50	3	120	0.0060	5.7	16605	70	299
M 4	3.00	0.70	3	120	0.0075	8.0	12730	72	286
M 5	4.00	0.80	3	120	0.0100	9.8	9550	57	287
M 6	4.80	1.00	3	120	0.0120	11.3	7960	57	287
M 8	6.40	1.25	3	120	0.0160	14.1	5970	57	287
M 10	7.95	1.50	4	120	0.0200	18.6	4805	79	384
M 12	9.95	1.75	4	120	0.0250	21.4	3840	66	384
M 16	12.80	2.00	4	120	0.0320	29.0	2985	76	382
M 3	2.30	0.50	3	150	0.0080	5.7	20760	116	498
M 4	3.00	0.70	3	150	0.0105	8.0	15915	125	501
M 5	4.00	0.80	3	150	0.0140	9.8	11935	100	501
M 6	4.80	1.00	3	150	0.0170	11.3	9945	101	507
M 8	6.40	1.25	3	150	0.0225	14.1	7460	101	504
M 10	7.95	1.50	4	150	0.0280	18.6	6005	138	673
M 12	9.95	1.75	4	150	0.0350	21.4	4800	115	672
M 16	12.80	2.00	4	150	0.0450	29.0	3730	134	671
M 3	2.30	0.50	3	200	0.0080	5.7	27680	155	664
M 4	3.00	0.70	3	200	0.0105	8.0	21220	167	668
M 5	4.00	0.80	3	200	0.0140	9.8	15915	134	668
M 6	4.80	1.00	3	200	0.0170	11.3	13265	135	677
M 8	6.40	1.25	3	200	0.0225	14.1	9945	134	671
M 10	7.95	1.50	4	200	0.0280	18.6	8010	184	897
M 12	9.95	1.75	4	200	0.0350	21.4	6400	153	896
M 16	12.80	2.00	4	200	0.0450	29.0	4975	179	896
M 3	2.30	0.50	3	40	0.0040	5.7	5535	15	66
M 4	3.00	0.70	3	40	0.0050	8.0	4245	16	64
M 5	4.00	0.80	3	40	0.0065	9.8	3185	12	62
M 6	4.80	1.00	3	40	0.0080	11.3	2655	13	64
M 8	6.40	1.25	3	40	0.0105	14.1	1990	13	63
M 10	7.95	1.50	4	40	0.0135	18.6	1600	18	86
M 12	9.95	1.75	4	40	0.0165	21.4	1280	14	85
M 16	12.80	2.00	4	40	0.0215	29.0	995	17	86

1.5xd, chamfer 45°, Incool



TM

Rm <850 HRC <24	Rm 850-1100 HRC 24-34	Rm 1100-1300 HRC 34-42	Rm 1300-1500 HRC 42-48	HRC 48-56				Inox Stainless	Ti Titanium	Aluminium / Copper GG(G)
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[illegible]

Application



Material

Steel
850 - 1100 N/mm²



Steel
850 - 1100 N/mm²



Steel
1300 - 1500 N/mm²



Steel
1300 - 1500 N/mm²



Wrought aluminium
alloys
Si < 6%
hardened



Wrought aluminium
alloys
Si < 6%
hardened



Cast iron
(lamellar / spheroidal)

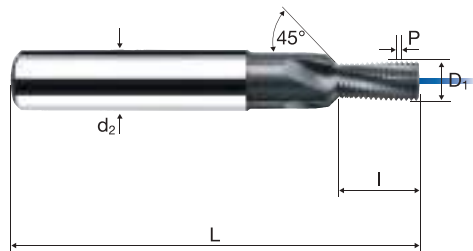


Cast iron
(lamellar / spheroidal)



MF	D ₁ [mm]	P [mm]	z	v _c [m/min]	f _z [mm]	L _K [mm]	n [min ⁻¹]	v _f [mm/min]	v _f [mm/min]
M 4	3.00	0.50	3	80	0.0075	7.9	8490	48	191
M 5	4.00	0.50	3	80	0.0100	9.4	6365	38	191
M 6	4.80	0.50	3	80	0.0120	10.6	5305	38	191
M 6	4.80	0.75	3	80	0.0120	10.8	5305	38	191
M 8	6.40	0.75	3	80	0.0160	14.1	3980	38	191
M 8	6.40	1.00	3	80	0.0160	14.5	3980	38	191
M 10	7.95	1.00	4	80	0.0200	17.8	3205	53	256
M 10	7.95	1.25	4	80	0.0200	18.2	3205	53	256
M 12	9.95	1.00	4	80	0.0250	20.8	2560	44	256
M 12	9.95	1.50	4	80	0.0250	21.6	2560	44	256
M 14	11.20	1.50	4	80	0.0280	25.1	2275	51	255
M 16	12.80	1.50	4	80	0.0320	28.3	1990	51	255
M 4	3.00	0.50	3	50	0.0065	7.9	5305	26	103
M 5	4.00	0.50	3	50	0.0090	9.4	3980	22	108
M 6	4.80	0.50	3	50	0.0105	10.6	3315	21	104
M 6	4.80	0.75	3	50	0.0105	10.8	3315	21	104
M 8	6.40	0.75	3	50	0.0140	14.1	2485	21	104
M 8	6.40	1.00	3	50	0.0140	14.5	2485	21	104
M 10	7.95	1.00	4	50	0.0175	17.8	2000	29	140
M 10	7.95	1.25	4	50	0.0175	18.2	2000	29	140
M 12	9.95	1.00	4	50	0.0220	20.8	1600	24	141
M 12	9.95	1.50	4	50	0.0220	21.6	1600	24	141
M 14	11.20	1.50	4	50	0.0250	25.1	1420	28	142
M 16	12.80	1.50	4	50	0.0285	28.3	1245	28	142
M 4	3.00	0.50	3	150	0.0105	7.9	15915	125	501
M 5	4.00	0.50	3	150	0.0140	9.4	11935	100	501
M 6	4.80	0.50	3	150	0.0170	10.6	9945	101	507
M 6	4.80	0.75	3	150	0.0170	10.8	9945	101	507
M 8	6.40	0.75	3	150	0.0225	14.1	7460	101	504
M 8	6.40	1.00	3	150	0.0225	14.5	7460	101	504
M 10	7.95	1.00	4	150	0.0280	17.8	6005	138	673
M 10	7.95	1.25	4	150	0.0280	18.2	6005	138	673
M 12	9.95	1.00	4	150	0.0350	20.8	4800	115	672
M 12	9.95	1.50	4	150	0.0350	21.6	4800	115	672
M 14	11.20	1.50	4	150	0.0395	25.1	4265	135	674
M 16	12.80	1.50	4	150	0.0450	28.3	3730	134	671
M 4	3.00	0.50	3	120	0.0075	7.9	12730	72	286
M 5	4.00	0.50	3	120	0.0100	9.4	9550	57	287
M 6	4.80	0.50	3	120	0.0120	10.6	7960	57	287
M 6	4.80	0.75	3	120	0.0120	10.8	7960	57	287
M 8	6.40	0.75	3	120	0.0160	14.1	5970	57	287
M 8	6.40	1.00	3	120	0.0160	14.5	5970	57	287
M 10	7.95	1.00	4	120	0.0200	17.8	4805	79	384
M 10	7.95	1.25	4	120	0.0200	18.2	4805	79	384
M 12	9.95	1.00	4	120	0.0250	20.8	3840	66	384
M 12	9.95	1.50	4	120	0.0250	21.6	3840	66	384
M 14	11.20	1.50	4	120	0.0280	25.1	3410	76	382
M 16	12.80	1.50	4	120	0.0320	28.3	2985	76	382

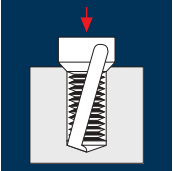
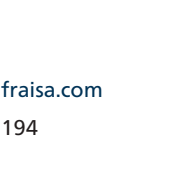
1.5xd, chamfer 45°, Incool



TM

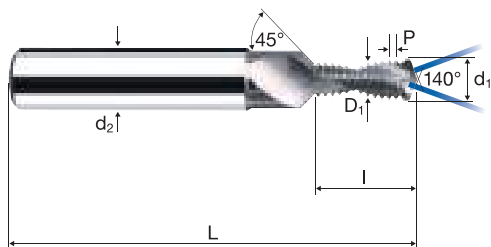
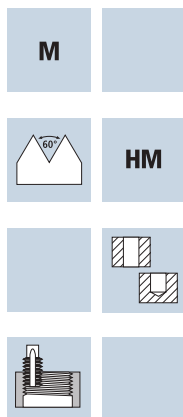
Rm <850 HRC < 24	Rm 850-1100 HRC 24-34	Rm 1100-1300 HRC 34-42	Rm 1300-1500 HRC 42-48	HRC 48-56			Inox Stainless	Ti Titanium	Aluminium / Copper GG(G)
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[illegible]

Application	Material	M	d ₁ [mm]	v _c [m/min]	f [mm]	L _K [mm]	n [min ⁻¹]	v _f [mm/min]
	Cast iron (lamellar / spheroidal) 	M 4	3.30	100	0.0500	9.5	9645	482
		M 5	4.20	100	0.0650	11.8	7580	493
		M 6	5.00	100	0.0750	14.7	6365	477
		M 8	6.80	100	0.1000	19.7	4680	468
		M 10	8.50	100	0.1250	23.8	3745	468
		M 12	10.20	100	0.1500	27.4	3120	468
		M 16	14.00	100	0.2100	37.8	2275	478
	Cast aluminium 	M 4	3.30	250	0.0600	9.5	24115	1447
		M 5	4.20	250	0.0750	11.8	18945	1421
		M 6	5.00	250	0.0900	14.7	15915	1432
		M 8	6.80	250	0.1200	19.7	11705	1405
		M 10	8.50	250	0.1500	23.8	9360	1404
		M 12	10.20	250	0.1800	27.4	7800	1404
		M 16	14.00	250	0.2500	37.8	5685	1421
	Wrought aluminium alloys Si < 6% hardened 	M 4	3.30	200	0.0600	9.5	19290	1157
		M 5	4.20	200	0.0750	11.8	15160	1137
		M 6	5.00	200	0.0900	14.7	12730	1146
		M 8	6.80	200	0.1200	19.7	9360	1123
		M 10	8.50	200	0.1500	23.8	7490	1124
		M 12	10.20	200	0.1800	27.4	6240	1123
		M 16	14.00	200	0.2500	37.8	4545	1136
	Short-chipping brass [CuZn] 	M 4	3.30	250	0.0600	9.5	24115	1447
		M 5	4.20	250	0.0750	11.8	18945	1421
		M 6	5.00	250	0.0900	14.7	15915	1432
		M 8	6.80	250	0.1200	19.7	11705	1405
		M 10	8.50	250	0.1500	23.8	9360	1404
		M 12	10.20	250	0.1800	27.4	7800	1404
		M 16	14.00	250	0.2500	37.8	5685	1421

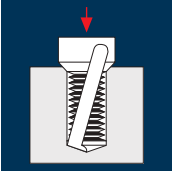
Application	Material	M	D ₁ [mm]	P [mm]	z	v _c [m/min]	f _z [mm]	n [min ⁻¹]	v _{fc} [mm/min]	v _f [mm/min]
	Cast iron (lamellar / spheroidal) 	M 4	3.20	0.70	2	100	0.0200	9945	80	398
		M 5	4.00	0.80	2	100	0.0250	7960	80	398
		M 6	4.75	1.00	2	100	0.0300	6700	84	402
		M 8	6.35	1.25	2	100	0.0400	5015	83	401
		M 10	7.95	1.50	2	100	0.0550	4005	90	441
		M 12	9.95	1.75	2	100	0.0650	3200	71	416
		M 16	13.20	2.00	2	100	0.0900	2410	76	434
	Cast aluminium 	M 4	3.20	0.70	2	250	0.0250	24870	249	1244
		M 5	4.00	0.80	2	250	0.0300	19895	239	1194
		M 6	4.75	1.00	2	250	0.0350	16755	244	1173
		M 8	6.35	1.25	2	250	0.0500	12530	258	1253
		M 10	7.95	1.50	2	250	0.0600	10010	246	1201
		M 12	9.95	1.75	2	250	0.0750	8000	205	1200
		M 16	13.20	2.00	2	250	0.1000	6030	211	1206
	Wrought aluminium alloys Si < 6% hardened 	M 4	3.20	0.70	2	200	0.0250	19895	199	995
		M 5	4.00	0.80	2	200	0.0300	15915	191	955
		M 6	4.75	1.00	2	200	0.0350	13405	196	938
		M 8	6.35	1.25	2	200	0.0500	10025	207	1003
		M 10	7.95	1.50	2	200	0.0600	8010	197	961
		M 12	9.95	1.75	2	200	0.0750	6400	164	960
		M 16	13.20	2.00	2	200	0.1000	4825	169	965
	Short-chipping brass [CuZn] 	M 4	3.20	0.70	2	250	0.0250	24870	249	1244
		M 5	4.00	0.80	2	250	0.0300	19895	239	1194
		M 6	4.75	1.00	2	250	0.0350	16755	244	1173
		M 8	6.35	1.25	2	250	0.0500	12530	258	1253
		M 10	7.95	1.50	2	250	0.0600	10010	246	1201
		M 12	9.95	1.75	2	250	0.0750	8000	205	1200
		M 16	13.20	2.00	2	250	0.1000	6030	211	1206

2xd, chamfer 45°, Incool



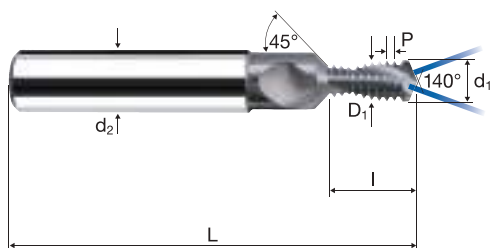
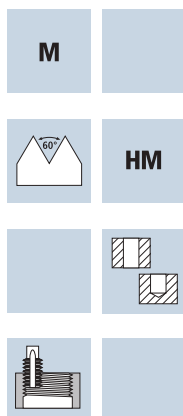
TM

[illegible]

Application	Material	M	d ₁ [mm]	v _c [m/min]	f [mm]	L _K [mm]	n [min ⁻¹]	v _f [mm/min]
	Cast iron (lamellar / spheroidal) 	M 4	3.30	100	0.0500	7.4	9645	482
		M 5	4.20	100	0.0650	9.4	7580	493
		M 6	5.00	100	0.0750	11.7	6365	477
		M 8	6.80	100	0.1000	14.7	4680	468
		M 10	8.50	100	0.1250	19.3	3745	468
		M 12	10.20	100	0.1500	22.2	3120	468
		M 16	14.00	100	0.2100	27.8	2275	478
	Cast aluminium 	M 4	3.30	250	0.0600	7.4	24115	1447
		M 5	4.20	250	0.0750	9.4	18945	1421
		M 6	5.00	250	0.0900	11.7	15915	1432
		M 8	6.80	250	0.1200	14.7	11705	1405
		M 10	8.50	250	0.1500	19.3	9360	1404
		M 12	10.20	250	0.1800	22.2	7800	1404
		M 16	14.00	250	0.2500	27.8	5685	1421
	Wrought aluminium alloys Si < 6% hardened 	M 4	3.30	200	0.0600	7.4	19290	1157
		M 5	4.20	200	0.0750	9.4	15160	1137
		M 6	5.00	200	0.0900	11.7	12730	1146
		M 8	6.80	200	0.1200	14.7	9360	1123
		M 10	8.50	200	0.1500	19.3	7490	1124
		M 12	10.20	200	0.1800	22.2	6240	1123
		M 16	14.00	200	0.2500	27.8	4545	1136
	Short-chipping brass [CuZn] 	M 4	3.30	250	0.0600	7.4	24115	1447
		M 5	4.20	250	0.0750	9.4	18945	1421
		M 6	5.00	250	0.0900	11.7	15915	1432
		M 8	6.80	250	0.1200	14.7	11705	1405
		M 10	8.50	250	0.1500	19.3	9360	1404
		M 12	10.20	250	0.1800	22.2	7800	1404
		M 16	14.00	250	0.2500	27.8	5685	1421

Application	Material	M	D ₁ [mm]	P [mm]	z	v _c [m/min]	f _z [mm]	n [min ⁻¹]	v _{fc} [mm/min]	v _f [mm/min]
	Cast iron (lamellar / spheroidal) 	M 4	3.20	0.70	2	100	0.0250	9945	99	497
		M 5	4.00	0.80	2	100	0.0300	7960	96	478
		M 6	4.75	1.00	2	100	0.0350	6700	98	469
		M 8	6.35	1.25	2	100	0.0500	5015	103	502
		M 10	7.95	1.50	2	100	0.0600	4005	99	481
		M 12	9.95	1.75	2	100	0.0750	3200	82	480
		M 16	13.20	2.00	2	100	0.1000	2410	84	482
	Cast aluminium 	M 4	3.20	0.70	2	250	0.0300	24870	298	1492
		M 5	4.00	0.80	2	250	0.0350	19895	279	1393
		M 6	4.75	1.00	2	250	0.0450	16755	314	1508
		M 8	6.35	1.25	2	250	0.0600	12530	310	1504
		M 10	7.95	1.50	2	250	0.0700	10010	287	1401
		M 12	9.95	1.75	2	250	0.0900	8000	246	1440
		M 16	13.20	2.00	2	250	0.1200	6030	253	1447
	Wrought aluminium alloys Si < 6% hardened 	M 4	3.20	0.70	2	200	0.0300	19895	239	1194
		M 5	4.00	0.80	2	200	0.0350	15915	223	1114
		M 6	4.75	1.00	2	200	0.0450	13405	251	1207
		M 8	6.35	1.25	2	200	0.0600	10025	248	1203
		M 10	7.95	1.50	2	200	0.0700	8010	230	1121
		M 12	9.95	1.75	2	200	0.0900	6400	197	1152
		M 16	13.20	2.00	2	200	0.1200	4825	203	1158
	Short-chipping brass [CuZn] 	M 4	3.20	0.70	2	250	0.0300	24870	298	1492
		M 5	4.00	0.80	2	250	0.0350	19895	279	1393
		M 6	4.75	1.00	2	250	0.0450	16755	314	1508
		M 8	6.35	1.25	2	250	0.0600	12530	310	1504
		M 10	7.95	1.50	2	250	0.0700	10010	287	1401
		M 12	9.95	1.75	2	250	0.0900	8000	246	1440
		M 16	13.20	2.00	2	250	0.1200	6030	253	1447

1.5xd, chamfer 45°, Incool



TM

[illegible]

Application

Material



Steel
850 - 1100 N/mm²



Steel
1300 - 1500 N/mm²



Hardened tool steel
48 - 52 HRC



Stainless steel
[Cr-Ni/1.4301]



Cast iron
(lamellar / spheroidal)



Wrought aluminium
alloys
Si < 6%
hardened



Cast aluminium

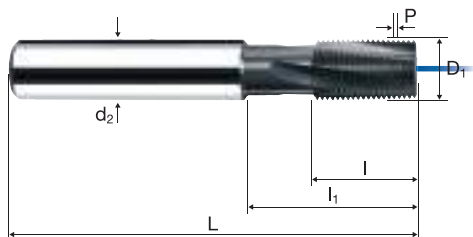
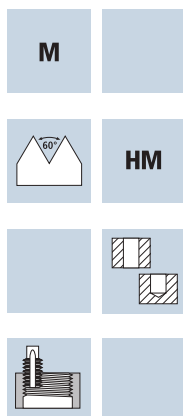


Titanium alloys
> 300 HB
[Ti6Al4V]



M	D ₁ [mm]	P [mm]	z	v _c [m/min]	f _z [mm]	n [min ⁻¹]	v _{fc} d/D ₁ 3/2	v _{fc} d/D ₁ 2/1	v _{fc} d/D ₁ 3/1	v _{fc} d/D ₁ 4/1	v _{fc} d/D ₁ 5/1	v _f [mm/min]
≥ M14	9.95	1.00	4	80	0.0250	2560	85	128	171	192	205	256
≥ M14	9.95	1.25	4	80	0.0250	2560	85	128	171	192	205	256
≥ M14	9.95	1.50	4	80	0.0250	2560	85	128	171	192	205	256
≥ M18	11.95	1.00	4	80	0.0300	2130	85	128	170	192	204	256
≥ M18	11.95	1.50	4	80	0.0300	2130	85	128	170	192	204	256
≥ M24	15.95	1.00	5	80	0.0400	1595	106	160	213	239	255	319
≥ M24	15.95	1.50	5	80	0.0400	1595	106	160	213	239	255	319
≥ M30	19.95	1.50	5	80	0.0500	1275	106	159	213	239	255	319
≥ M30	19.95	2.00	5	80	0.0500	1275	106	159	213	239	255	319
≥ M14	9.95	1.00	4	50	0.0200	1600	43	64	85	96	102	128
≥ M14	9.95	1.25	4	50	0.0200	1600	43	64	85	96	102	128
≥ M14	9.95	1.50	4	50	0.0200	1600	43	64	85	96	102	128
≥ M18	11.95	1.00	4	50	0.0240	1330	43	64	85	96	102	128
≥ M18	11.95	1.50	4	50	0.0240	1330	43	64	85	96	102	128
≥ M24	15.95	1.00	5	50	0.0320	1000	53	80	107	120	128	160
≥ M24	15.95	1.50	5	50	0.0320	1000	53	80	107	120	128	160
≥ M30	19.95	1.50	5	50	0.0400	800	53	80	107	120	128	160
≥ M30	19.95	2.00	5	50	0.0400	800	53	80	107	120	128	160
≥ M14	9.95	1.00	4	30	0.0165	960	21	32	42	48	51	63
≥ M14	9.95	1.25	4	30	0.0165	960	21	32	42	48	51	63
≥ M14	9.95	1.50	4	30	0.0165	960	21	32	42	48	51	63
≥ M18	11.95	1.00	4	30	0.0200	800	21	32	43	48	51	64
≥ M18	11.95	1.50	4	30	0.0200	800	21	32	43	48	51	64
≥ M24	15.95	1.00	5	30	0.0265	600	27	40	53	60	64	80
≥ M24	15.95	1.50	5	30	0.0265	600	27	40	53	60	64	80
≥ M30	19.95	1.50	5	30	0.0335	480	27	40	54	60	64	80
≥ M30	19.95	2.00	5	30	0.0335	480	27	40	54	60	64	80
≥ M14	9.95	1.00	4	45	0.0200	1440	38	58	77	86	92	115
≥ M14	9.95	1.25	4	45	0.0200	1440	38	58	77	86	92	115
≥ M14	9.95	1.50	4	45	0.0200	1440	38	58	77	86	92	115
≥ M18	11.95	1.00	4	45	0.0240	1200	38	58	77	86	92	115
≥ M18	11.95	1.50	4	45	0.0240	1200	38	58	77	86	92	115
≥ M24	15.95	1.00	5	45	0.0320	900	48	72	96	108	115	144
≥ M24	15.95	1.50	5	45	0.0320	900	48	72	96	108	115	144
≥ M30	19.95	1.50	5	45	0.0400	720	48	72	96	108	115	144
≥ M30	19.95	2.00	5	45	0.0400	720	48	72	96	108	115	144
≥ M14	9.95	1.00	4	120	0.0250	3840	128	192	256	288	307	384
≥ M14	9.95	1.25	4	120	0.0250	3840	128	192	256	288	307	384
≥ M14	9.95	1.50	4	120	0.0250	3840	128	192	256	288	307	384
≥ M18	11.95	1.00	4	120	0.0300	3195	128	192	256	288	307	383
≥ M18	11.95	1.50	4	120	0.0300	3195	128	192	256	288	307	383
≥ M24	15.95	1.00	5	120	0.0400	2395	160	240	319	359	383	479
≥ M24	15.95	1.50	5	120	0.0400	2395	160	240	319	359	383	479
≥ M30	19.95	1.50	5	120	0.0500	1915	160	239	319	359	383	479
≥ M30	19.95	2.00	5	120	0.0500	1915	160	239	319	359	383	479
≥ M14	9.95	1.00	4	150	0.0285	4800	182	274	365	410	438	547
≥ M14	9.95	1.25	4	150	0.0285	4800	182	274	365	410	438	547
≥ M14	9.95	1.50	4	150	0.0285	4800	182	274	365	410	438	547
≥ M18	11.95	1.00	4	150	0.0340	3995	181	272	362	407	435	543
≥ M18	11.95	1.50	4	150	0.0340	3995	181	272	362	407	435	543
≥ M24	15.95	1.00	5	150	0.0455	2995	227	341	454	511	545	681
≥ M24	15.95	1.50	5	150	0.0455	2995	227	341	454	511	545	681
≥ M30	19.95	1.50	5	150	0.0570	2395	228	341	455	512	546	683
≥ M30	19.95	2.00	5	150	0.0570	2395	228	341	455	512	546	683
≥ M14	9.95	1.00	4	200	0.0285	6400	243	365	486	547	584	730
≥ M14	9.95	1.25	4	200	0.0285	6400	243	365	486	547	584	730
≥ M14	9.95	1.50	4	200	0.0285	6400	243	365	486	547	584	730
≥ M18	11.95	1.00	4	200	0.0340	5325	241	362	483	543	579	724
≥ M18	11.95	1.50	4	200	0.0340	5325	241	362	483	543	579	724
≥ M24	15.95	1.00	5	200	0.0455	3990	303	454	605	681	726	908
≥ M24	15.95	1.50	5	200	0.0455	3990	303	454	605	681	726	908
≥ M30	19.95	1.50	5	200	0.0570	3190	303	455	606	682	727	909
≥ M30	19.95	2.00	5	200	0.0570	3190	303	455	606	682	727	909
≥ M14	9.95	1.00	4	35	0.0200	1120	30	45	60	67	72	90
≥ M14	9.95	1.25	4	35	0.0200	1120	30	45	60	67	72	90
≥ M14	9.95	1.50	4	35	0.0200	1120	30	45	60	67	72	90
≥ M18	11.95	1.00	4	35	0.0240	930	30	45	60	67	71	89
≥ M18	11.95	1.50	4	35	0.0240	930	30	45	60	67	71	89
≥ M24	15.95	1.00	5	35	0.0320	700	37	56	75	84	90	112
≥ M24	15.95	1.50	5	35	0.0320	700	37	56	75	84	90	112
≥ M30	19.95	1.50	5	35	0.0400	560	37	56	75	84	90	112
≥ M30	19.95	2.00	5	35	0.0400	560	37	56	75	84	90	112

Incool



TM

Rm ≤850 HRC ≤24	Rm 850-1100 HRC 24-34	Rm 1100-1300 HRC 34-42	Rm 1300-1500 HRC 42-48	HRC 48-56			Inox Stainless	Ti Titanium	Aluminium / Copper GG(G)
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[illegible]

Application

Material



Steel
850 - 1100 N/mm²



Steel
1300 - 1500 N/mm²



Hardened tool steel
48 - 52 HRC



Stainless steel
[Cr-Ni/1.4301]



Cast iron
(lamellar / spheroidal)



Wrought aluminium alloys
Si < 6%
hardened



Cast aluminium

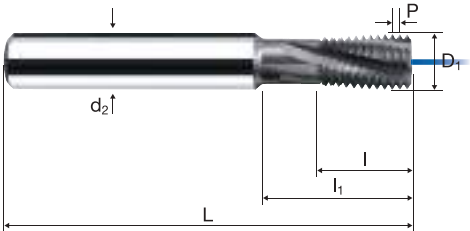
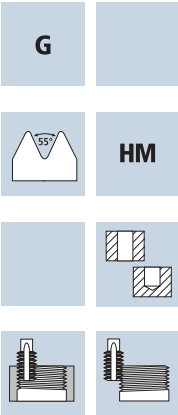


Titanium alloys
> 300 HB
[Ti6Al4V]

[illegible]

Multi-range thread milling cutters

Incool



TM

Rm <850 HRC <24	Rm 850-1100 HRC 24-34	Rm 1100-1300 HRC 34-42	Rm 1300-1500 HRC 42-48	HRC 48-56			Inox Stainless	Ti Titanium	Aluminium / Copper GG(G)
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Example: Order-N°.										Article-N°.		ø-Code		TiCN	
										EH26040		552			
Ø Code	d min.	P(TPI)	L	I	I ₁	d ₂ h ₆	D1								
552	1/4	19.0	70	16.00	25.0	10.0	9.95	4			●				
554	1/2	14.0	90	25.00	40.0	16.0	15.95	5			●				
558	1"	11.0	105	33.00	50.0	20.0	19.95	5			●				
	</														



Metric coarse thread M

Tolerance ISO 2 (6H)

N° EC10540 / EC10541



Xtap

	HSS PM/F		Rm 850-1100 HRC 24-34	Inox Stainless	207
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N° EC10545



Xtap

	HSS PM/F		Rm 850-1100 HRC 24-34	Inox Stainless	209
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N° EC10550 / EC10551



Xtap

	HSS PM/F		Rm 850-1100 HRC 24-34	Inox Stainless	211
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N° EC10560 / EC10561



Xtap

	HSS PM/F		Rm 850-1100 HRC 24-34	Inox Stainless	213
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N° EC10570



Xtap

	HSS PM/F		Rm 850-1100 HRC 24-34	Inox Stainless	215
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N° EC10580



Xtap

	HSS PM/F		Rm 850-1100 HRC 24-34	Inox Stainless	217
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N° EH0100 / EH0101



	HSS PM/F		Rm <850 HRC <24		219
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N° EH10310 / EH10311



s-tap

	HSS-E Co5		Rm <850 HRC <24		221
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N° EH0595 / EH0596



h-tap

	HSS PM/F		Rm 850-1500 HRC 34-48		223
--	-------------	--	--------------------------------	--	-----

N° EH6900 / EH6901



durotap H

	HM MG10		HRC 48->60		225
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N° EH0600 / EH0601



c-tap

	HSS PM/F		GG(G) Cast iron		227
--	-------------	--	--------------------	--	-----

N° EH6550 / EH6551



durotap GG

	HM MG10		GG(G) Cast iron		229
--	------------	--	--------------------	--	-----

N° EI0020 / EI0021



	HSS PM/F		Al Aluminium Alloy	Cu Copper	231
--	-------------	--	--------------------------	--------------	-----

N° EI0050 / EI0051



	HSS PM/F		Al Aluminium Alloy	Cu Copper	233
--	-------------	--	--------------------------	--------------	-----

N° EH6350 / EH6351



durotap A

	HM MG10		Al Aluminium Cast		235
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N° ET0705 / ET0706



titap

	HSS PM/F		Ti Titanium		237
--	-------------	--	----------------	--	-----

M
MF
G
UN
EG

Metric coarse thread M

Tolerance ISO 2 (6H)

N° E0755 / E0756



titap



HSS
PM/F



Ti
Titanium

241

N° E10410 / E10411



HSS
PM/F



Ni
Nickel
Alloy

243

N° E10800 / E10801



u-tap



HSS-E
Co5



Rm
< 850
HRC
< 24

245

N° E10820 / E10821



u-tap



HSS-E
Co5



Rm
< 850
HRC
< 24

249

Tolerance ISO 2 (6H) extra long

N° E10345



HSS-E
Co5



Rm
< 850
HRC
< 24

253

N° E10355



HSS-E
Co5



Rm
< 850
HRC
< 24

255

Tolerance ISO 2 (6H) LH

N° E10130 / E10131



HSS-E
Co5



Rm
< 850
HRC
< 24

257

N° E10135 / E10136



HSS-E
Co5



Rm
< 850
HRC
< 24

259

Tolerance ISO 2 +0.1

N° E10140 / E10141



HSS-E
Co5



Rm
< 850
HRC
< 24

261

N° E10145 / E10146



HSS-E
Co5



Rm
< 850
HRC
< 24

263

Tolerance ISO 3 (6G)

N° EK10590 / EK10591



HSS-E
Co5



Rm
850-1100
HRC
24-34

265

N° EK10595 / EK10596



HSS-E
Co5



Rm
850-1100
HRC
24-34

267

Metric coarse thread M / MJ

Tolerance 7G

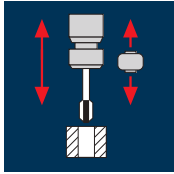
N° E10150 / E10151			HSS-E Co5		Rm < 850 HRC < 24		269
N° E10155 / E10156			HSS-E Co5		Rm < 850 HRC < 24		271

MJ Tolerance 4H

N° E10420			HSS PM/F		Ni Nickel Alloy		273
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- M
- MF
- G
- UN
- EG

Application



Material

Steel
500 - 850 N/mm²



Steel
500 - 850 N/mm²



Steel
850 - 1100 N/mm²



Steel
850 - 1100 N/mm²



Stainless steel
ferritic/martensitic



Stainless steel
ferritic/martensitic



Stainless steel
[Cr-Ni/1.4301]



Stainless steel
[Cr-Ni/1.4301]



M	d [mm]	P [mm]	v _c 1.5 x d			v _c 2.0 x d			v _c 3.0 x d		
			n [min ⁻¹]	f _r [100%]		n [min ⁻¹]	f _r [100%]		n [min ⁻¹]	f _r [100%]	
M 2	2.000	0.40	26	4140	1656	22	3500	1400	18	2865	1146
M 2.5	2.500	0.45	26	3310	1490	22	2800	1260	18	2290	1031
M 3	3.000	0.50	26	2760	1380	22	2335	1168	18	1910	955
M 4	4.000	0.70	26	2070	1449	22	1750	1225	18	1430	1001
M 5	5.000	0.80	26	1655	1324	22	1400	1120	18	1145	916
M 6	6.000	1.00	26	1380	1380	22	1165	1165	18	955	955
M 8	8.000	1.25	26	1035	1294	22	875	1094	18	715	894
M 10	10.000	1.50	26	830	1245	22	700	1050	18	575	863
M 12	12.000	1.75	26	690	1208	22	585	1024	18	475	831
M 14	14.000	2.00	26	590	1180	22	500	1000	18	410	820
M 16	16.000	2.00	26	515	1030	22	440	880	18	360	720
M 18	18.000	2.50	26	460	1150	22	390	975	18	320	800
M 20	20.000	2.50	26	415	1038	22	350	875	18	285	713
M 22	22.000	2.50	26	375	938	22	320	800	18	260	650
M 24	24.000	3.00	26	345	1035	22	290	870	18	240	720
M 2	2.000	0.40	22	3500	1400	18	2865	1146	14	2230	892
M 2.5	2.500	0.45	22	2800	1260	18	2290	1031	14	1785	803
M 3	3.000	0.50	22	2335	1168	18	1910	955	14	1485	743
M 4	4.000	0.70	22	1750	1225	18	1430	1001	14	1115	781
M 5	5.000	0.80	22	1400	1120	18	1145	916	14	890	712
M 6	6.000	1.00	22	1165	1165	18	955	955	14	745	745
M 8	8.000	1.25	22	875	1094	18	715	894	14	555	694
M 10	10.000	1.50	22	700	1050	18	575	863	14	445	668
M 12	12.000	1.75	22	585	1024	18	475	831	14	370	648
M 14	14.000	2.00	22	500	1000	18	410	820	14	320	640
M 16	16.000	2.00	22	440	880	18	360	720	14	280	560
M 18	18.000	2.50	22	390	975	18	320	800	14	250	625
M 20	20.000	2.50	22	350	875	18	285	713	14	225	563
M 22	22.000	2.50	22	320	800	18	260	650	14	205	513
M 24	24.000	3.00	22	290	870	18	240	720	14	185	555
M 2	2.000	0.40	14	2230	892	12	1910	764	10	1590	636
M 2.5	2.500	0.45	14	1785	803	12	1530	689	10	1275	574
M 3	3.000	0.50	14	1485	743	12	1275	638	10	1060	530
M 4	4.000	0.70	14	1115	781	12	955	669	10	795	557
M 5	5.000	0.80	14	890	712	12	765	612	10	635	508
M 6	6.000	1.00	14	745	745	12	635	635	10	530	530
M 8	8.000	1.25	14	555	694	12	475	594	10	400	500
M 10	10.000	1.50	14	445	668	12	380	570	10	320	480
M 12	12.000	1.75	14	370	648	12	320	560	10	265	464
M 14	14.000	2.00	14	320	640	12	275	550	10	225	450
M 16	16.000	2.00	14	280	560	12	240	480	10	200	400
M 18	18.000	2.50	14	250	625	12	210	525	10	175	438
M 20	20.000	2.50	14	225	563	12	190	475	10	160	400
M 22	22.000	2.50	14	205	513	12	175	438	10	145	363
M 24	24.000	3.00	14	185	555	12	160	480	10	135	405
M 2	2.000	0.40	8	1275	510	6	955	382	5	795	318
M 2.5	2.500	0.45	8	1020	459	6	765	344	5	635	286
M 3	3.000	0.50	8	850	425	6	635	318	5	530	265
M 4	4.000	0.70	8	635	445	6	475	333	5	400	280
M 5	5.000	0.80	8	510	408	6	380	304	5	320	265
M 6	6.000	1.00	8	425	425	6	320	320	5	265	265
M 8	8.000	1.25	8	320	400	6	240	300	5	200	250
M 10	10.000	1.50	8	255	383	6	190	285	5	160	240
M 12	12.000	1.75	8	210	368	6	160	280	5	135	236
M 14	14.000	2.00	8	180	360	6	135	270	5	115	230
M 16	16.000	2.00	8	160	320	6	120	240	5	100	200
M 18	18.000	2.50	8	140	350	6	105	263	5	90	225
M 20	20.000	2.50	8	125	313	6	95	238	5	80	200
M 22	22.000	2.50	8	115	288	6	85	213	5	70	175
M 24	24.000	3.00	8	105	315	6	80	240	5	65	195

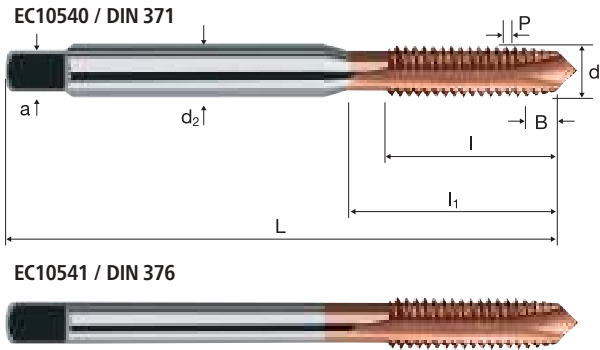


M

ISO 2
(6H)

HSS
PM/F

Form B



Rm
<850
HRC
< 24

Rm
850-1100
HRC
24-34

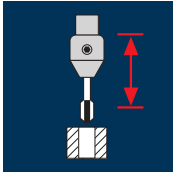
Inox
Stainless

M
MF
G
UN
EG

Example: Order-Nº. EC10540 034											AICrTiN
Article-Nº. EC10540 α-Code 034											EC10540
Ø Code	d	P	L	l	l ₁	d ₂	a				
034	M 2	0.40	45	8.00	-	2.8	2.1	2	1.60		●
040	M 2.5	0.45	50	9.00	-	2.8	2.1	2	2.05		●
044	M 3	0.50	56	12.00	18.0	3.5	2.7	3	2.50		●
058	M 4	0.70	63	13.00	21.0	4.5	3.4	3	3.30		●
084	M 5	0.80	70	15.00	25.0	6.0	4.9	3	4.20		●
088	M 6	1.00	80	17.00	30.0	6.0	4.9	3	5.00		●
160	M 8	1.25	90	20.00	35.0	8.0	6.2	3	6.80		●
174	M 10	1.50	100	22.00	39.0	10.0	8.0	3	8.50		●

Example: Order-Nº. EC10541 240											AICrTiN
Article-Nº. EC10541 α-Code 240											EC10541
Ø Code	d	P	L	l	l ₁	d ₂	a				
240	M 12	1.75	110	24.00	40.0	9.0	7.0	3	10.20		●
244	M 14	2.00	110	26.00	40.0	11.0	9.0	3	12.00		●
246	M 16	2.00	110	27.00	40.0	12.0	9.0	3	14.00		●
312	M 18	2.50	125	30.00	45.0	14.0	11.0	4	15.50		●
314	M 20	2.50	140	32.00	50.0	16.0	12.0	4	17.50		●
316	M 22	2.50	140	32.00	50.0	18.0	14.5	4	19.50		●
320	M 24	3.00	160	34.00	60.0	18.0	14.5	4	21.00		●

Application



Material

Steel
500 - 850 N/mm²



Steel
850 - 1100 N/mm²



Stainless steel
ferritic/martensitic



Stainless steel
[Cr-Ni/1.4301]



Cast iron
GG



Cast iron
GGG

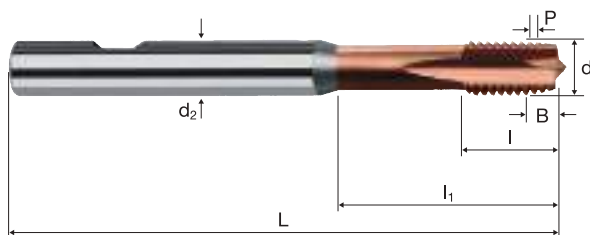


Wrought aluminium
alloys
Si < 6%
hardened



M	d [mm]	P [mm]	v_c 1.5 x d	n [min ⁻¹]	v_c 2.0 x d	n [min ⁻¹]	v_c 3.0 x d	n [min ⁻¹]
M 3	3.000	0.50	26	2760	22	2335	18	1910
M 4	4.000	0.70	26	2070	22	1750	18	1430
M 5	5.000	0.80	26	1655	22	1400	18	1145
M 6	6.000	1.00	26	1380	22	1165	18	955
M 8	8.000	1.25	26	1035	22	875	18	715
M 10	10.000	1.50	26	830	22	700	18	575
M 12	12.000	1.75	26	690	22	585	18	475
M 16	16.000	2.00	26	515	22	440	18	360
M 20	20.000	2.50	26	415	22	350	18	285
M 3	3.000	0.50	22	2335	18	1910	14	1485
M 4	4.000	0.70	22	1750	18	1430	14	1115
M 5	5.000	0.80	22	1400	18	1145	14	890
M 6	6.000	1.00	22	1165	18	955	14	745
M 8	8.000	1.25	22	875	18	715	14	555
M 10	10.000	1.50	22	700	18	575	14	445
M 12	12.000	1.75	22	585	18	475	14	370
M 16	16.000	2.00	22	440	18	360	14	280
M 20	20.000	2.50	22	350	18	285	14	225
M 3	3.000	0.50	14	1485	12	1275	10	1060
M 4	4.000	0.70	14	1115	12	955	10	795
M 5	5.000	0.80	14	890	12	765	10	635
M 6	6.000	1.00	14	745	12	635	10	530
M 8	8.000	1.25	14	555	12	475	10	400
M 10	10.000	1.50	14	445	12	380	10	320
M 12	12.000	1.75	14	370	12	320	10	265
M 16	16.000	2.00	14	280	12	240	10	200
M 20	20.000	2.50	14	225	12	190	10	160
M 3	3.000	0.50	8	850	6	635	5	530
M 4	4.000	0.70	8	635	6	475	5	400
M 5	5.000	0.80	8	510	6	380	5	320
M 6	6.000	1.00	8	425	6	320	5	265
M 8	8.000	1.25	8	320	6	240	5	200
M 10	10.000	1.50	8	255	6	190	5	160
M 12	12.000	1.75	8	210	6	160	5	135
M 16	16.000	2.00	8	160	6	120	5	100
M 20	20.000	2.50	8	125	6	95	5	80
M 3	3.000	0.50	26	2760	22	2335	18	1910
M 4	4.000	0.70	26	2070	22	1750	18	1430
M 5	5.000	0.80	26	1655	22	1400	18	1145
M 6	6.000	1.00	26	1380	22	1165	18	955
M 8	8.000	1.25	26	1035	22	875	18	715
M 10	10.000	1.50	26	830	22	700	18	575
M 12	12.000	1.75	26	690	22	585	18	475
M 16	16.000	2.00	26	515	22	440	18	360
M 20	20.000	2.50	26	415	22	350	18	285
M 3	3.000	0.50	22	2335	18	1910	14	1485
M 4	4.000	0.70	22	1750	18	1430	14	1115
M 5	5.000	0.80	22	1400	18	1145	14	890
M 6	6.000	1.00	22	1165	18	955	14	745
M 8	8.000	1.25	22	875	18	715	14	555
M 10	10.000	1.50	22	700	18	575	14	445
M 12	12.000	1.75	22	585	18	475	14	370
M 16	16.000	2.00	22	440	18	360	14	280
M 20	20.000	2.50	22	350	18	285	14	225
M 3	3.000	0.50	25	2655	20	2120	15	1590
M 4	4.000	0.70	25	1990	20	1590	15	1195
M 5	5.000	0.80	25	1590	20	1275	15	955
M 6	6.000	1.00	25	1325	20	1060	15	795
M 8	8.000	1.25	25	995	20	795	15	595
M 10	10.000	1.50	25	795	20	635	15	475
M 12	12.000	1.75	25	665	20	530	15	400
M 16	16.000	2.00	25	495	20	400	15	300
M 20	20.000	2.50	25	400	20	320	15	240

ISO 2
(6H)



Rm
850-1100
HRC
24-34

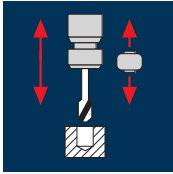
Inox Stainless

GG(G)
Aluminium

M
MF
G
UN
EG

[illegible]

Application



Material

Steel
500 - 850 N/mm²



Steel
500 - 850 N/mm²



Steel
850 - 1100 N/mm²



Steel
850 - 1100 N/mm²



Stainless steel
ferritic/martensitic



Stainless steel
ferritic/martensitic



Stainless steel
[Cr-Ni/1.4301]



Stainless steel
[Cr-Ni/1.4301]



M	d [mm]	P [mm]	v _c 1.5 x d			v _c 2.0 x d			v _c 2.5 x d		
			n [min ⁻¹]	f _r [100%]		n [min ⁻¹]	f _r [100%]		n [min ⁻¹]	f _r [100%]	
M 2	2.000	0.40	32	5095	2038	28	4455	1782	22	3500	1400
M 2.5	2.500	0.45	32	4075	1834	28	3565	1604	22	2800	1260
M 3	3.000	0.50	32	3395	1698	28	2970	1485	22	2335	1168
M 4	4.000	0.70	32	2545	1782	28	2230	1561	22	1750	1225
M 5	5.000	0.80	32	2035	1628	28	1785	1428	22	1400	1120
M 6	6.000	1.00	32	1700	1700	28	1485	1485	22	1165	1165
M 8	8.000	1.25	32	1275	1594	28	1115	1394	22	875	1094
M 10	10.000	1.50	32	1020	1530	28	890	1335	22	700	1050
M 10	10.000	1.50	32	1020	1530	28	890	1335	22	700	1050
M 12	12.000	1.75	32	850	1488	28	745	1304	22	585	1024
M 14	14.000	2.00	32	730	1460	28	635	1270	22	500	1000
M 16	16.000	2.00	32	635	1270	28	555	1110	22	440	880
M 18	18.000	2.50	32	565	1413	28	495	1238	22	390	975
M 20	20.000	2.50	32	510	1275	28	445	1113	22	350	875
M 22	22.000	2.50	32	465	1163	28	405	1013	22	320	800
M 24	24.000	3.00	32	425	1275	28	370	1110	22	290	870
M 2	2.000	0.40	20	3185	1274	16	2545	1018	10	1590	636
M 2.5	2.500	0.45	20	2545	1145	16	2035	916	10	1275	574
M 3	3.000	0.50	20	2120	1060	16	1700	850	10	1060	530
M 4	4.000	0.70	20	1590	1113	16	1275	893	10	795	557
M 5	5.000	0.80	20	1275	1020	16	1020	816	10	635	508
M 6	6.000	1.00	20	1060	1060	16	850	850	10	530	530
M 8	8.000	1.25	20	795	994	16	635	794	10	400	500
M 10	10.000	1.50	20	635	953	16	510	765	10	320	480
M 10	10.000	1.50	20	635	953	16	510	765	10	320	480
M 12	12.000	1.75	20	530	928	16	425	744	10	265	464
M 14	14.000	2.00	20	455	910	16	365	730	10	225	450
M 16	16.000	2.00	20	400	800	16	320	640	10	200	400
M 18	18.000	2.50	20	355	888	16	285	713	10	175	438
M 20	20.000	2.50	20	320	800	16	255	638	10	160	400
M 22	22.000	2.50	20	290	725	16	230	575	10	145	363
M 24	24.000	3.00	20	265	795	16	210	630	10	135	405
M 2	2.000	0.40	10	1590	636	8	1275	510	6	955	382
M 2.5	2.500	0.45	10	1275	574	8	1020	459	6	765	344
M 3	3.000	0.50	10	1060	530	8	850	425	6	635	318
M 4	4.000	0.70	10	795	557	8	635	445	6	475	333
M 5	5.000	0.80	10	635	508	8	510	408	6	380	304
M 6	6.000	1.00	10	530	530	8	425	425	6	320	320
M 8	8.000	1.25	10	400	500	8	320	400	6	240	300
M 10	10.000	1.50	10	320	480	8	255	383	6	190	285
M 10	10.000	1.50	10	320	480	8	255	383	6	190	285
M 12	12.000	1.75	10	265	464	8	210	368	6	160	280
M 14	14.000	2.00	10	225	450	8	180	360	6	135	270
M 16	16.000	2.00	10	200	400	8	160	320	6	120	240
M 18	18.000	2.50	10	175	438	8	140	350	6	105	263
M 20	20.000	2.50	10	160	400	8	125	313	6	95	238
M 22	22.000	2.50	10	145	363	8	115	288	6	85	213
M 24	24.000	3.00	10	135	405	8	105	315	6	80	240
M 2	2.000	0.40	5	795	318	4	635	254	3	475	190
M 2.5	2.500	0.45	5	635	286	4	510	230	3	380	171
M 3	3.000	0.50	5	530	265	4	425	213	3	320	160
M 4	4.000	0.70	5	400	280	4	320	224	3	240	168
M 5	5.000	0.80	5	320	256	4	255	204	3	190	152
M 6	6.000	1.00	5	265	265	4	210	210	3	160	160
M 8	8.000	1.25	5	200	250	4	160	200	3	120	150
M 10	10.000	1.50	5	160	240	4	125	188	3	95	143
M 10	10.000	1.50	5	160	240	4	125	188	3	95	143
M 12	12.000	1.75	5	135	236	4	105	184	3	80	140
M 14	14.000	2.00	5	115	230	4	90	180	3	70	140
M 16	16.000	2.00	5	100	200	4	80	160	3	60	120
M 18	18.000	2.50	5	90	225	4	70	175	3	55	138
M 20	20.000	2.50	5	80	200	4	65	163	3	50	125
M 22	22.000	2.50	5	70	175	4	60	150	3	45	113
M 24	24.000	3.00	5	65	195	4	55	165	3	40	120

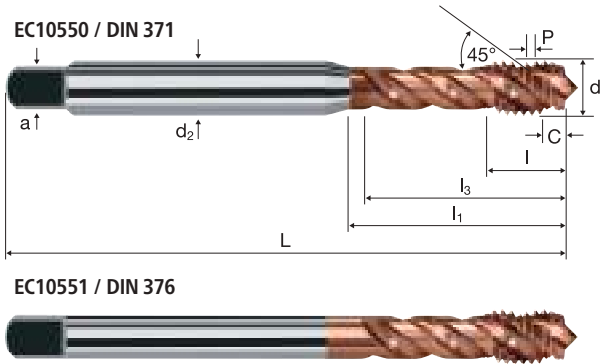


M

ISO 2
(6H)

HSS
PM/F

Form C



Rm
<850
HRC
<24

Rm
850-1100
HRC
24-34

Inox
Stainless

M
MF
G
UN
EG

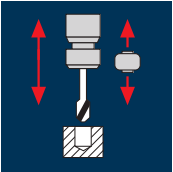
Example: Order-N°.											Article-N°. α-Code	
											EC10550 034	
Ø Code	d	P	L	l	l ₁	l ₃	d ₂	a				AICrTiN EC10550
034	M 2	0.40	45	8.00	12.5	10.5	2.8	2.1	3	1.60		●
040	M 2.5	0.45	50	9.00	15.0	13.0	2.8	2.1	3	2.05		●
044	M 3	0.50	56	4.00	18.0	16.0	3.5	2.7	3	2.50		●
058	M 4	0.70	63	5.60	21.0	19.0	4.5	3.4	3	3.30		●
084	M 5	0.80	70	6.40	25.0	23.0	6.0	4.9	3	4.20		●
088	M 6	1.00	80	8.00	30.0	28.0	6.0	4.9	3	5.00		●
160	M 8	1.25	90	10.00	35.0	33.0	8.0	6.2	3	6.80		●
173	M 10	1.50	100	12.00	39.0	37.0	10.0	8.0	3	8.50		●
174	M 10	1.50	100	12.00	39.0	37.0	10.0	8.0	4	8.50		●

Example: Order-N°.											Article-N°. α-Code	
											EC10551 240	
Ø Code	d	P	L	l	l ₁	l ₃	d ₂	a				AICrTiN EC10551
240	M 12	1.75	110	14.00	50.0	48.0	9.0	7.0	4	10.20		●
244	M 14	2.00	110	16.00	58.0	56.0	11.0	9.0	4	12.00		●
246	M 16	2.00	110	16.00	58.0	56.0	12.0	9.0	4	14.00		●
312	M 18	2.50	125	20.00	65.0	63.0	14.0	11.0	4	15.50		●
314	M 20	2.50	140	20.00	72.0	70.0	16.0	12.0	4	17.50		●
316	M 22	2.50	140	20.00	72.0	70.0	18.0	14.5	5	19.50		●
320	M 24	3.00	160	24.00	74.0	72.0	18.0	14.5	5	21.00		●

fraisa.com

211

Application



Material

Steel
500 - 850 N/mm²



M	d [mm]	P [mm]	v _c 1.5×d	n [min ⁻¹]	v _f [100%]	v _c 2.0×d	n [min ⁻¹]	v _f [100%]	v _c 2.5×d	n [min ⁻¹]	v _f [100%]
M 4	4.000	0.70	32	2545	1782	28	2230	1561	22	1750	1225
M 5	5.000	0.80	32	2035	1628	28	1785	1428	22	1400	1120
M 6	6.000	1.00	32	1700	1700	28	1485	1485	22	1165	1165
M 8	8.000	1.25	32	1275	1594	28	1115	1394	22	875	1094
M 10	10.000	1.50	32	1020	1530	28	890	1335	22	700	1050
M 12	12.000	1.75	32	850	1488	28	745	1304	22	585	1024
M 14	14.000	2.00	32	730	1460	28	635	1270	22	500	1000
M 16	16.000	2.00	32	635	1270	28	555	1110	22	440	880
M 18	18.000	2.50	32	565	1413	28	495	1238	22	390	975
M 20	20.000	2.50	32	510	1275	28	445	1113	22	350	875
M 22	22.000	2.50	32	465	1163	28	405	1013	22	320	800
M 24	24.000	3.00	32	425	1275	28	370	1110	22	290	870
M 4	4.000	0.70	20	1590	1113	16	1275	893	10	795	557
M 5	5.000	0.80	20	1275	1020	16	1020	816	10	635	508
M 6	6.000	1.00	20	1060	1060	16	850	850	10	530	530
M 8	8.000	1.25	20	795	994	16	635	794	10	400	500
M 10	10.000	1.50	20	635	953	16	510	765	10	320	480
M 12	12.000	1.75	20	530	928	16	425	744	10	265	464
M 14	14.000	2.00	20	455	910	16	365	730	10	225	450
M 16	16.000	2.00	20	400	800	16	320	640	10	200	400
M 18	18.000	2.50	20	355	888	16	285	713	10	175	438
M 20	20.000	2.50	20	320	800	16	255	638	10	160	400
M 22	22.000	2.50	20	290	725	16	230	575	10	145	363
M 24	24.000	3.00	20	265	795	16	210	630	10	135	405
M 4	4.000	0.70	10	795	557	8	635	445	6	475	333
M 5	5.000	0.80	10	635	508	8	510	408	6	380	304
M 6	6.000	1.00	10	530	530	8	425	425	6	320	320
M 8	8.000	1.25	10	400	500	8	320	400	6	240	300
M 10	10.000	1.50	10	320	480	8	255	383	6	190	285
M 12	12.000	1.75	10	265	464	8	210	368	6	160	280
M 14	14.000	2.00	10	225	450	8	180	360	6	135	270
M 16	16.000	2.00	10	200	400	8	160	320	6	120	240
M 18	18.000	2.50	10	175	438	8	140	350	6	105	263
M 20	20.000	2.50	10	160	400	8	125	313	6	95	238
M 22	22.000	2.50	10	145	363	8	115	288	6	85	213
M 24	24.000	3.00	10	135	405	8	105	315	6	80	240
M 4	4.000	0.70	5	400	280	4	320	224	3	240	168
M 5	5.000	0.80	5	320	256	4	255	204	3	190	152
M 6	6.000	1.00	5	265	265	4	210	210	3	160	160
M 8	8.000	1.25	5	200	250	4	160	200	3	120	150
M 10	10.000	1.50	5	160	240	4	125	188	3	95	143
M 12	12.000	1.75	5	135	236	4	105	184	3	80	140
M 14	14.000	2.00	5	115	230	4	90	180	3	70	140
M 16	16.000	2.00	5	100	200	4	80	160	3	60	120
M 18	18.000	2.50	5	90	225	4	70	175	3	55	138
M 20	20.000	2.50	5	80	200	4	65	163	3	50	125
M 22	22.000	2.50	5	70	175	4	60	150	3	45	113
M 24	24.000	3.00	5	65	195	4	55	165	3	40	120

Taps Xtap

Incool

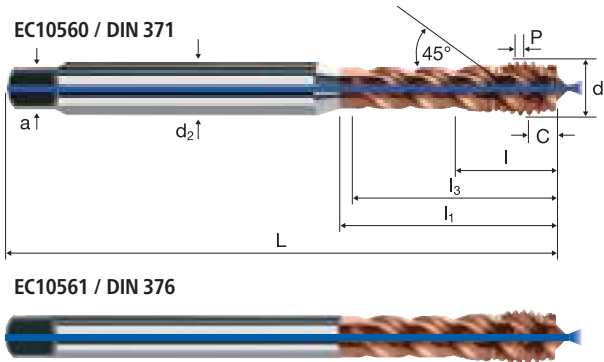


M

ISO 2
(6H)

HSS
PM/F

Form C



Rm
<850
HRC
<24

Rm
850-1100
HRC
24-34

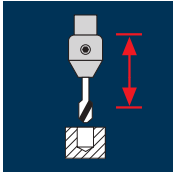
Inox
Stainless

M
MF
G
UN
EG

Example: Order-N°.											Article-N°. α-Code	
											EC10560 058	
Ø Code	d	P	L	l	l ₁	l ₃	d ₂	a				AICrTiN EC10560
058	M 4	0.70	63	5.60	21.0	19.0	4.5	3.4	3	3.30		●
084	M 5	0.80	70	6.40	25.0	23.0	6.0	4.9	3	4.20		●
088	M 6	1.00	80	8.00	30.0	28.0	6.0	4.9	3	5.00		●
160	M 8	1.25	90	10.00	35.0	33.0	8.0	6.2	3	6.80		●
174	M 10	1.50	100	12.00	39.0	37.0	10.0	8.0	4	8.50		●

Example: Order-N°.											Article-N°. α-Code	
											EC10561 240	
Ø Code	d	P	L	l	l ₁	l ₃	d ₂	a				AICrTiN EC10561
240	M 12	1.75	110	14.00	50.0	48.0	9.0	7.0	4	10.20		●
244	M 14	2.00	110	16.00	58.0	56.0	11.0	9.0	4	12.00		●
246	M 16	2.00	110	16.00	58.0	56.0	12.0	9.0	4	14.00		●
312	M 18	2.50	125	20.00	65.0	63.0	14.0	11.0	4	15.50		●
314	M 20	2.50	140	20.00	72.0	70.0	16.0	12.0	4	17.50		●
316	M 22	2.50	140	20.00	72.0	70.0	18.0	14.5	5	19.50		●
320	M 24	3.00	160	24.00	74.0	72.0	18.0	14.5	5	21.00		●

Application



Material

Steel
500 - 850 N/mm²



Steel
850 - 1100 N/mm²



Stainless steel
ferritic/martensitic



Stainless steel
[Cr-Ni/1.4301]



Cast iron
GG



Cast iron
GGG

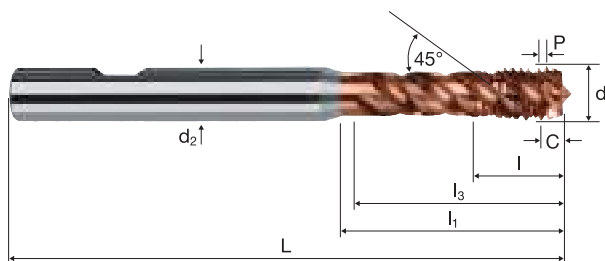


Wrought aluminium
alloys
Si < 6%
hardened



M	d [mm]	P [mm]	v_c 1.0 x d	n [min ⁻¹]	v_c 1.5 x d	n [min ⁻¹]	v_c 2.0 x d	n [min ⁻¹]
M 4	4.000	0.70	34	2705	32	2545	28	2230
M 5	5.000	0.80	34	2165	32	2035	28	1785
M 6	6.000	1.00	34	1805	32	1700	28	1485
M 8	8.000	1.25	34	1355	32	1275	28	1115
M 10	10.000	1.50	34	1080	32	1020	28	890
M 12	12.000	1.75	34	900	32	850	28	745
M 16	16.000	2.00	34	675	32	635	28	555
M 20	20.000	2.50	34	540	32	510	28	445
M 24	24.000	3.00	34	450	32	425	28	370
M 4	4.000	0.70	22	1750	20	1590	16	1275
M 5	5.000	0.80	22	1400	20	1275	16	1020
M 6	6.000	1.00	22	1165	20	1060	16	850
M 8	8.000	1.25	22	875	20	795	16	635
M 10	10.000	1.50	22	700	20	635	16	510
M 12	12.000	1.75	22	585	20	530	16	425
M 16	16.000	2.00	22	440	20	400	16	320
M 20	20.000	2.50	22	350	20	320	16	255
M 24	24.000	3.00	22	290	20	265	16	210
M 4	4.000	0.70	12	955	10	795	8	635
M 5	5.000	0.80	12	765	10	635	8	510
M 6	6.000	1.00	12	635	10	530	8	425
M 8	8.000	1.25	12	475	10	400	8	320
M 10	10.000	1.50	12	380	10	320	8	255
M 12	12.000	1.75	12	320	10	265	8	210
M 16	16.000	2.00	12	240	10	200	8	160
M 20	20.000	2.50	12	190	10	160	8	125
M 24	24.000	3.00	12	160	10	135	8	105
M 4	4.000	0.70	7	555	5	400	4	320
M 5	5.000	0.80	7	445	5	320	4	255
M 6	6.000	1.00	7	370	5	265	4	210
M 8	8.000	1.25	7	280	5	200	4	160
M 10	10.000	1.50	7	225	5	160	4	125
M 12	12.000	1.75	7	185	5	135	4	105
M 16	16.000	2.00	7	140	5	100	4	80
M 20	20.000	2.50	7	110	5	80	4	65
M 24	24.000	3.00	7	95	5	65	4	55
M 4	4.000	0.70	34	2705	32	2545	28	2230
M 5	5.000	0.80	34	2165	32	2035	28	1785
M 6	6.000	1.00	34	1805	32	1700	28	1485
M 8	8.000	1.25	34	1355	32	1275	28	1115
M 10	10.000	1.50	34	1080	32	1020	28	890
M 12	12.000	1.75	34	900	32	850	28	745
M 16	16.000	2.00	34	675	32	635	28	555
M 20	20.000	2.50	34	540	32	510	28	445
M 24	24.000	3.00	34	450	32	425	28	370
M 4	4.000	0.70	22	1750	20	1590	16	1275
M 5	5.000	0.80	22	1400	20	1275	16	1020
M 6	6.000	1.00	22	1165	20	1060	16	850
M 8	8.000	1.25	22	875	20	795	16	635
M 10	10.000	1.50	22	700	20	635	16	510
M 12	12.000	1.75	22	585	20	530	16	425
M 16	16.000	2.00	22	440	20	400	16	320
M 20	20.000	2.50	22	350	20	320	16	255
M 24	24.000	3.00	22	290	20	265	16	210
M 4	4.000	0.70	32	2545	28	2230	22	1750
M 5	5.000	0.80	32	2035	28	1785	22	1400
M 6	6.000	1.00	32	1700	28	1485	22	1165
M 8	8.000	1.25	32	1275	28	1115	22	875
M 10	10.000	1.50	32	1020	28	890	22	700
M 12	12.000	1.75	32	850	28	745	22	585
M 16	16.000	2.00	32	635	28	555	22	440
M 20	20.000	2.50	32	510	28	445	22	350
M 24	24.000	3.00	32	425	28	370	22	290

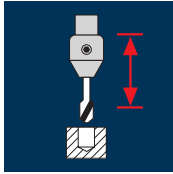
Form C

GG(G)
Aluminium

M
MF
G
UN
EG

215

Application



Material

Steel
500 - 850 N/mm²



Steel
850 - 1100 N/mm²



Stainless steel
ferritic/martensitic



Stainless steel
[Cr-Ni/1.4301]



Cast iron
GG



Cast iron
GGG



Wrought aluminium
alloys
Si < 6%
hardened

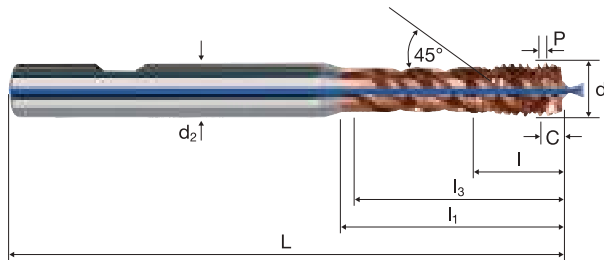


M	d [mm]	P [mm]	v_c 1.0 x d	n [min ⁻¹]	v_c 1.5 x d	n [min ⁻¹]	v_c 2.0 x d	n [min ⁻¹]
M 4	4.000	0.70	34	2705	32	2545	28	2230
M 5	5.000	0.80	34	2165	32	2035	28	1785
M 6	6.000	1.00	34	1805	32	1700	28	1485
M 8	8.000	1.25	34	1355	32	1275	28	1115
M 10	10.000	1.50	34	1080	32	1020	28	890
M 12	12.000	1.75	34	900	32	850	28	745
M 16	16.000	2.00	34	675	32	635	28	555
M 20	20.000	2.50	34	540	32	510	28	445
M 24	24.000	3.00	34	450	32	425	28	370
M 4	4.000	0.70	22	1750	20	1590	16	1275
M 5	5.000	0.80	22	1400	20	1275	16	1020
M 6	6.000	1.00	22	1165	20	1060	16	850
M 8	8.000	1.25	22	875	20	795	16	635
M 10	10.000	1.50	22	700	20	635	16	510
M 12	12.000	1.75	22	585	20	530	16	425
M 16	16.000	2.00	22	440	20	400	16	320
M 20	20.000	2.50	22	350	20	320	16	255
M 24	24.000	3.00	22	290	20	265	16	210
M 4	4.000	0.70	12	955	10	795	8	635
M 5	5.000	0.80	12	765	10	635	8	510
M 6	6.000	1.00	12	635	10	530	8	425
M 8	8.000	1.25	12	475	10	400	8	320
M 10	10.000	1.50	12	380	10	320	8	255
M 12	12.000	1.75	12	320	10	265	8	210
M 16	16.000	2.00	12	240	10	200	8	160
M 20	20.000	2.50	12	190	10	160	8	125
M 24	24.000	3.00	12	160	10	135	8	105
M 4	4.000	0.70	7	555	5	400	4	320
M 5	5.000	0.80	7	445	5	320	4	255
M 6	6.000	1.00	7	370	5	265	4	210
M 8	8.000	1.25	7	280	5	200	4	160
M 10	10.000	1.50	7	225	5	160	4	125
M 12	12.000	1.75	7	185	5	135	4	105
M 16	16.000	2.00	7	140	5	100	4	80
M 20	20.000	2.50	7	110	5	80	4	65
M 24	24.000	3.00	7	95	5	65	4	55
M 4	4.000	0.70	34	2705	32	2545	28	2230
M 5	5.000	0.80	34	2165	32	2035	28	1785
M 6	6.000	1.00	34	1805	32	1700	28	1485
M 8	8.000	1.25	34	1355	32	1275	28	1115
M 10	10.000	1.50	34	1080	32	1020	28	890
M 12	12.000	1.75	34	900	32	850	28	745
M 16	16.000	2.00	34	675	32	635	28	555
M 20	20.000	2.50	34	540	32	510	28	445
M 24	24.000	3.00	34	450	32	425	28	370
M 4	4.000	0.70	22	1750	20	1590	16	1275
M 5	5.000	0.80	22	1400	20	1275	16	1020
M 6	6.000	1.00	22	1165	20	1060	16	850
M 8	8.000	1.25	22	875	20	795	16	635
M 10	10.000	1.50	22	700	20	635	16	510
M 12	12.000	1.75	22	585	20	530	16	425
M 16	16.000	2.00	22	440	20	400	16	320
M 20	20.000	2.50	22	350	20	320	16	255
M 24	24.000	3.00	22	290	20	265	16	210
M 4	4.000	0.70	32	2545	28	2230	22	1750
M 5	5.000	0.80	32	2035	28	1785	22	1400
M 6	6.000	1.00	32	1700	28	1485	22	1165
M 8	8.000	1.25	32	1275	28	1115	22	875
M 10	10.000	1.50	32	1020	28	890	22	700
M 12	12.000	1.75	32	850	28	745	22	585
M 16	16.000	2.00	32	635	28	555	22	440
M 20	20.000	2.50	32	510	28	445	22	350
M 24	24.000	3.00	32	425	28	370	22	290

Incool



ISO 2
(6H)

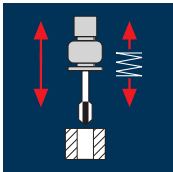


Rm
850-1100
HRC
24-34

GG(G)
Aluminium

M
MF
G
UN
EG

[illegible]

Application	Material	M	d [mm]	P [mm]	v_c 1.5 x d	n [min ⁻¹]	v_f [100%]	v_c 2.0 x d	n [min ⁻¹]	v_f [100%]	v_c 3.0 x d	n [min ⁻¹]	v_f [100%]
	Steel < 500 N/mm ² 	M 2	2.000	0.40	28	4455	1782	23	3660	1464	18	2865	1146
		M 2.5	2.500	0.45	28	3565	1604	23	2930	1319	18	2290	1031
		M 3	3.000	0.50	28	2970	1485	23	2440	1220	18	1910	955
		M 4	4.000	0.70	28	2230	1561	23	1830	1281	18	1430	1001
		M 5	5.000	0.80	28	1785	1428	23	1465	1172	18	1145	916
		M 6	6.000	1.00	28	1485	1485	23	1220	1220	18	955	955
		M 8	8.000	1.25	28	1115	1394	23	915	1144	18	715	894
		M 10	10.000	1.50	28	890	1335	23	730	1095	18	575	863
		M 12	12.000	1.75	28	745	1304	23	610	1068	18	475	831
		M 14	14.000	2.00	28	635	1270	23	525	1050	18	410	820
		M 16	16.000	2.00	28	555	1110	23	460	920	18	360	720
		M 18	18.000	2.50	28	495	1238	23	405	1013	18	320	800
	Steel < 500 N/mm ²	M 20	20.000	2.50	28	445	1113	23	365	913	18	285	713
		M 22	22.000	2.50	28	405	1013	23	335	838	18	260	650
		M 24	24.000	3.00	28	370	1110	23	305	915	18	240	720
	Steel 500 - 850 N/mm ²	M 2	2.000	0.40	25	3980	1592	20	3185	1274	15	2385	954
		M 2.5	2.500	0.45	25	3185	1433	20	2545	1145	15	1910	860
		M 3	3.000	0.50	25	2655	1328	20	2120	1060	15	1590	795
		M 4	4.000	0.70	25	1990	1393	20	1590	1113	15	1195	837
		M 5	5.000	0.80	25	1590	1272	20	1275	1020	15	955	764
		M 6	6.000	1.00	25	1325	1325	20	1060	1060	15	795	795
		M 8	8.000	1.25	25	995	1244	20	795	994	15	595	744
		M 10	10.000	1.50	25	795	1193	20	635	953	15	475	713
		M 12	12.000	1.75	25	665	1164	20	530	928	15	400	700
		M 14	14.000	2.00	25	570	1140	20	455	910	15	340	680
		M 16	16.000	2.00	25	495	990	20	400	800	15	300	600
		M 18	18.000	2.50	25	440	1100	20	355	888	15	265	663
	Steel 500 - 850 N/mm ²	M 20	20.000	2.50	25	400	1000	20	320	800	15	240	600
		M 22	22.000	2.50	25	360	900	20	290	725	15	215	538
		M 24	24.000	3.00	25	330	990	20	265	795	15	200	600

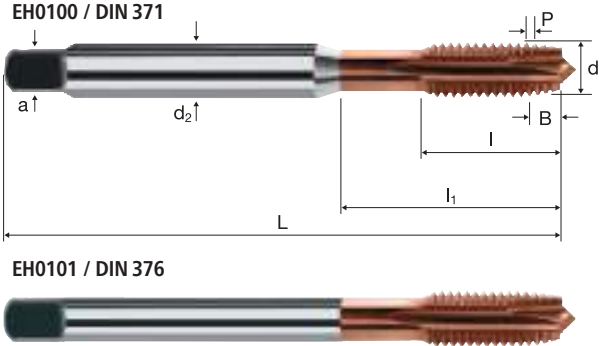
M

ISO 2
(6H)

HSS
PM/F

DIN
371/376

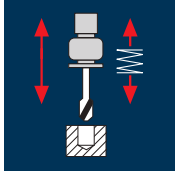
Form B



Rm <850 HRC <24	Rm 850-1100 HRC 24-34										
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Example: Order-Nº. EH0100 034										AICrTiN	
Article-Nº. EH0100 α-Code 034										EH0100	
Ø Code	d	P	L	l	l ₁	d ₂	a				
034	M 2	0.40	45	8.00	-	2.8	2.1	2	1.60		●
040	M 2.5	0.45	50	9.00	-	2.8	2.1	2	2.05		●
044	M 3	0.50	56	12.00	18.0	3.5	2.7	3	2.50		●
058	M 4	0.70	63	13.00	21.0	4.5	3.4	3	3.30		●
084	M 5	0.80	70	15.00	25.0	6.0	4.9	3	4.20		●
088	M 6	1.00	80	17.00	30.0	6.0	4.9	3	5.00		●
160	M 8	1.25	90	20.00	35.0	8.0	6.2	3	6.80		●
174	M 10	1.50	100	22.00	39.0	10.0	8.0	3	8.50		●

Example: Order-Nº. EH0101 240										AICrTiN	
Article-Nº. EH0101 α-Code 240										EH0101	
Ø Code	d	P	L	l	l ₁	d ₂	a				
240	M 12	1.75	110	24.00	40.0	9.0	7.0	3	10.20		●
244	M 14	2.00	110	26.00	40.0	11.0	9.0	3	12.00		●
246	M 16	2.00	110	27.00	40.0	12.0	9.0	3	14.00		●
312	M 18	2.50	125	30.00	45.0	14.0	11.0	4	15.50		●
314	M 20	2.50	140	32.00	50.0	16.0	12.0	4	17.50		●
316	M 22	2.50	140	32.00	50.0	18.0	14.5	4	19.50		●
320	M 24	3.00	160	34.00	60.0	18.0	14.5	4	21.00		●

Application	Material	M	d [mm]	P [mm]	v_c 1.0 x d	n [min ⁻¹]	v_f [100%]	v_c 1.5 x d	n [min ⁻¹]	v_f [100%]	v_c 2.0 x d	n [min ⁻¹]	v_f [100%]
	Steel < 500 N/mm ²	M 2	2.000	0.40	25	3980	1592	20	3185	1274	18	2865	1146
		M 2.5	2.500	0.45	25	3185	1433	20	2545	1145	18	2290	1031
		M 3	3.000	0.50	25	2655	1328	20	2120	1060	18	1910	955
		M 4	4.000	0.70	25	1990	1393	20	1590	1113	18	1430	1001
		M 5	5.000	0.80	25	1590	1272	20	1275	1020	18	1145	916
		M 6	6.000	1.00	25	1325	1325	20	1060	1060	18	955	955
		M 8	8.000	1.25	25	995	1244	20	795	994	18	715	894
		M 10	10.000	1.50	25	795	1193	20	635	953	18	575	863
		M 12	12.000	1.75	25	665	1164	20	530	928	18	475	831
		M 14	14.000	2.00	25	570	1140	20	455	910	18	410	820
		M 16	16.000	2.00	25	495	990	20	400	800	18	360	720
		M 18	18.000	2.50	25	440	1100	20	355	888	18	320	800
	Steel < 500 N/mm ²	M 20	20.000	2.50	25	400	1000	20	320	800	18	285	713
		M 22	22.000	2.50	25	360	900	20	290	725	18	260	650
		M 24	24.000	3.00	25	330	990	20	265	795	18	240	720
	Steel 500 - 850 N/mm ²	M 2	2.000	0.40	16	2545	1018	14	2230	892	12	1910	764
		M 2.5	2.500	0.45	16	2035	916	14	1785	803	12	1530	689
		M 3	3.000	0.50	16	1700	850	14	1485	743	12	1275	638
		M 4	4.000	0.70	16	1275	893	14	1115	781	12	955	669
		M 5	5.000	0.80	16	1020	816	14	890	712	12	765	612
		M 6	6.000	1.00	16	850	850	14	745	745	12	635	635
		M 8	8.000	1.25	16	635	794	14	555	694	12	475	594
		M 10	10.000	1.50	16	510	765	14	445	668	12	380	570
		M 12	12.000	1.75	16	425	744	14	370	648	12	320	560
	Steel 500 - 850 N/mm ²	M 14	14.000	2.00	16	365	730	14	320	640	12	275	550
		M 16	16.000	2.00	16	320	640	14	280	560	12	240	480
		M 18	18.000	2.50	16	285	713	14	250	625	12	210	525
		M 20	20.000	2.50	16	255	638	14	225	563	12	190	475
		M 22	22.000	2.50	16	230	575	14	205	513	12	175	438
		M 24	24.000	3.00	16	210	630	14	185	555	12	160	480
	Cast iron GG	M 2	2.000	0.40	14	2230	892	12	1910	764	10	1590	636
		M 2.5	2.500	0.45	14	1785	803	12	1530	689	10	1275	574
		M 3	3.000	0.50	14	1485	743	12	1275	638	10	1060	530
		M 4	4.000	0.70	14	1115	781	12	955	669	10	795	557
		M 5	5.000	0.80	14	890	712	12	765	612	10	635	508
		M 6	6.000	1.00	14	745	745	12	635	635	10	530	530
		M 8	8.000	1.25	14	555	694	12	475	594	10	400	500
		M 10	10.000	1.50	14	445	668	12	380	570	10	320	480
		M 12	12.000	1.75	14	370	648	12	320	560	10	265	464
	Cast iron GG	M 14	14.000	2.00	14	320	640	12	275	550	10	225	450
		M 16	16.000	2.00	14	280	560	12	240	480	10	200	400
		M 18	18.000	2.50	14	250	625	12	210	525	10	175	438
		M 20	20.000	2.50	14	225	563	12	190	475	10	160	400
		M 22	22.000	2.50	14	205	513	12	175	438	10	145	363
		M 24	24.000	3.00	14	185	555	12	160	480	10	135	405
 	Stainless steel [Cr-Ni/1.4301]	M 2	2.000	0.40	3	475	190	2	320	128	2	320	128
		M 2.5	2.500	0.45	3	380	171	2	255	115	2	255	115
		M 3	3.000	0.50	3	320	160	2	210	105	2	210	105
		M 4	4.000	0.70	3	240	168	2	160	112	2	160	112
		M 5	5.000	0.80	3	190	152	2	125	100	2	125	100
		M 6	6.000	1.00	3	160	160	2	105	105	2	105	105
		M 8	8.000	1.25	3	120	150	2	80	100	2	80	100
		M 10	10.000	1.50	3	95	143	2	65	98	2	65	98
		M 12	12.000	1.75	3	80	140	2	55	96	2	55	96
 	Stainless steel [Cr-Ni/1.4301]	M 14	14.000	2.00	3	70	140	2	45	90	2	45	90
		M 16	16.000	2.00	3	60	120	2	40	80	2	40	80
		M 18	18.000	2.50	3	55	138	2	35	88	2	35	88
		M 20	20.000	2.50	3	50	125	2	30	75	2	30	75
		M 22	22.000	2.50	3	45	113	2	30	75	2	30	75
		M 24	24.000	3.00	3	40	120	2	25	75	2	25	75

Taps s-tap

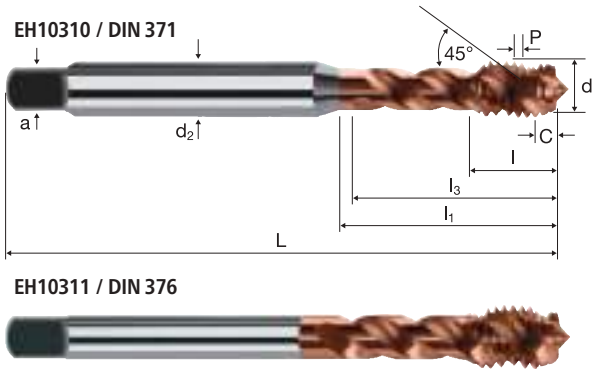


M

ISO 2
(6H)

HSS-E
Co5

X - P
Form C



Rm
<850
HRC
<24

Rm
850-1100
HRC
24-34

Inox
Stainless

GG(G)

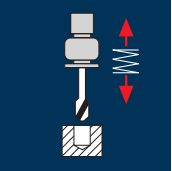
M
MF
G
UN
EG

Example: Order-N°.											Article-N°. α-Code	
											EH10310 034	
Ø Code	d	P	L	l	l ₁	l ₃	d ₂	a				
034	M 2	0.40	45	8.00	-	10.5	2.8	2.1	3	1.60		●
040	M 2.5	0.45	50	9.00	-	13.0	2.8	2.1	3	2.05		●
044	M 3	0.50	56	4.00	18.0	16.0	3.5	2.7	3	2.50		●
058	M 4	0.70	63	5.60	21.0	19.0	4.5	3.4	3	3.30		●
084	M 5	0.80	70	6.40	25.0	23.0	6.0	4.9	3	4.20		●
088	M 6	1.00	80	8.00	30.0	28.0	6.0	4.9	3	5.00		●
160	M 8	1.25	90	10.00	35.0	33.0	8.0	6.2	3	6.80		●
174	M 10	1.50	100	12.00	39.0	37.0	10.0	8.0	3	8.50		●

Example: Order-N°.											Article-N°. α-Code	
											EH10311 240	
Ø Code	d	P	L	l	l ₁	l ₃	d ₂	a				
240	M 12	1.75	110	14.00	50.0	48.0	9.0	7.0	3	10.20		●
244	M 14	2.00	110	16.00	58.0	56.0	11.0	9.0	4	12.00		●
246	M 16	2.00	110	16.00	58.0	56.0	12.0	9.0	4	14.00		●
312	M 18	2.50	125	20.00	65.0	63.0	14.0	11.0	4	15.50		●
314	M 20	2.50	140	20.00	72.0	70.0	16.0	12.0	4	17.50		●
316	M 22	2.50	140	20.00	72.0	70.0	18.0	14.5	4	19.50		●
320	M 24	3.00	160	24.00	74.0	72.0	18.0	14.5	4	21.00		●

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Application	Material	M	d [mm]	P [mm]	v_c 1.0 x d	n [min ⁻¹]	v_f [100%]	v_c 1.5 x d	n [min ⁻¹]	v_f [100%]
	Steel 1100 - 1300 N/mm ²	M 3	3.000	0.50	6	635	318	5	530	265
		M 4	4.000	0.70	6	475	333	5	400	280
		M 5	5.000	0.80	6	380	304	5	320	256
		M 6	6.000	1.00	6	320	320	5	265	265
		M 8	8.000	1.25	6	240	300	5	200	250
		M 10	10.000	1.50	6	190	285	5	160	240
		M 12	12.000	1.75	6	160	280	5	135	236
		M 14	14.000	2.00	6	135	270	5	115	230
		M 16	16.000	2.00	6	120	240	5	100	200
		M 18	18.000	2.50	6	105	263	5	90	225
		M 20	20.000	2.50	6	95	238	5	80	200
		M 22	22.000	2.50	6	85	213	5	70	175
		M 24	24.000	3.00	6	80	240	5	65	195
		M 3	3.000	0.50	5	530	265	4	425	213
		M 4	4.000	0.70	5	400	280	4	320	224
		M 5	5.000	0.80	5	320	256	4	255	204
		M 6	6.000	1.00	5	265	265	4	210	210
		M 8	8.000	1.25	5	200	250	4	160	200
		M 10	10.000	1.50	5	160	240	4	125	188
		M 12	12.000	1.75	5	135	236	4	105	184
		M 14	14.000	2.00	5	115	230	4	90	180
		M 16	16.000	2.00	5	100	200	4	80	160
		M 18	18.000	2.50	5	90	225	4	70	175
		M 20	20.000	2.50	5	80	200	4	65	163
		M 22	22.000	2.50	5	70	175	4	60	150
		M 24	24.000	3.00	5	65	195	4	55	165

Taps h-tap

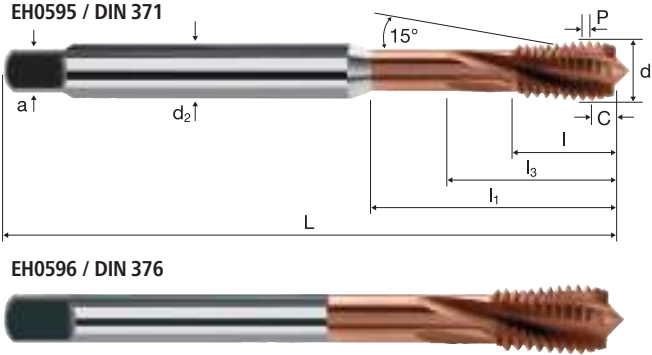


M

ISO 2
(6H)

HSS
PM/F

Form C

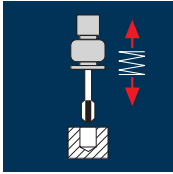


		Rm 1100-1300 HRC 34-42	Rm 1300-1500 HRC 42-48								
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Example: Order-Nº. EH0595 Article-Nº. 044 ø-Code 044											AICrTiN
											EH0595
Ø Code	d	P	L	l	l ₁	l ₃	d ₂	a			
044	M 3	0.50	56	5.00	18.0	16.0	3.5	2.7	3	2.60*	●
058	M 4	0.70	63	7.00	21.0	19.0	4.5	3.4	3	3.40	●
084	M 5	0.80	70	8.00	25.0	23.0	6.0	4.9	3	4.30	●
088	M 6	1.00	80	10.00	30.0	28.0	6.0	4.9	3	5.10	●
160	M 8	1.25	90	13.00	35.0	33.0	8.0	6.2	3	6.90	●
174	M 10	1.50	100	15.00	39.0	37.0	10.0	8.0	4	8.60	●

Example: Order-Nº. EH0596 Article-Nº. 240 ø-Code 240											AICrTiN
											EH0596
Ø Code	d	P	L	l	l ₁	l ₃	d ₂	a			
240	M 12	1.75	110	18.00	50.0	48.0	9.0	7.0	4	10.40	●
244	M 14	2.00	110	20.00	58.0	56.0	11.0	9.0	4	12.20	●
246	M 16	2.00	110	20.00	58.0	56.0	12.0	9.0	4	14.20	●
312	M 18	2.50	125	25.00	65.0	63.0	14.0	11.0	4	15.70	●
314	M 20	2.50	140	25.00	72.0	70.0	16.0	12.0	4	17.70	●
316	M 22	2.50	140	25.00	72.0	70.0	18.0	14.5	4	19.70	●
320	M 24	3.00	160	30.00	74.0	72.0	18.0	14.5	5	21.20	●
* The given dimension core hole drill size is out of norm											

Application



Material

Hardened tool steel
48 - 52 HRC



Hardened tool steel
52 - 56 HRC



Hardened tool steel
56 - 60 HRC



Hardened tool steel
> 60 HRC



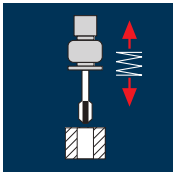
M	d [mm]	P [mm]	v _c 1.5 x d			v _c 2.0 x d			v _c 3.0 x d		
			n [min ⁻¹]	f _f [100%]		n [min ⁻¹]	f _f [100%]		n [min ⁻¹]	f _f [100%]	
M 4	4.000	0.70	8	635	445	6	475	333	4	320	224
M 5	5.000	0.80	8	510	408	6	380	304	4	255	204
M 6	6.000	1.00	8	425	425	6	320	320	4	210	210
M 8	8.000	1.25	8	320	400	6	240	300	4	160	200
M 10	10.000	1.50	8	255	383	6	190	285	4	125	188
M 12	12.000	1.75	8	210	368	6	160	280	4	105	184
M 14	14.000	2.00	8	180	360	6	135	270	4	90	180
M 16	16.000	2.00	8	160	320	6	120	240	4	80	160

M 4	4.000	0.70	6	475	333	4	320	224	3	240	168
M 5	5.000	0.80	6	380	304	4	255	204	3	190	152
M 6	6.000	1.00	6	320	320	4	210	210	3	160	160
M 8	8.000	1.25	6	240	300	4	160	200	3	120	150
M 10	10.000	1.50	6	190	285	4	125	188	3	95	143
M 12	12.000	1.75	6	160	280	4	105	184	3	80	140
M 14	14.000	2.00	6	135	270	4	90	180	3	70	140
M 16	16.000	2.00	6	120	240	4	80	160	3	60	120

M 4	4.000	0.70	4	320	224	2	160	112	-	-	-
M 5	5.000	0.80	4	255	204	2	125	100	-	-	-
M 6	6.000	1.00	4	210	210	2	105	105	-	-	-
M 8	8.000	1.25	4	160	200	2	80	100	-	-	-
M 10	10.000	1.50	4	125	188	2	65	98	-	-	-
M 12	12.000	1.75	4	105	184	2	55	96	-	-	-
M 14	14.000	2.00	4	90	180	2	45	90	-	-	-
M 16	16.000	2.00	4	80	160	2	40	80	-	-	-

M 4	4.000	0.70	2	160	112	1.5	120	84	-	-	-
M 5	5.000	0.80	2	125	100	1.5	95	76	-	-	-
M 6	6.000	1.00	2	105	105	1.5	80	80	-	-	-
M 8	8.000	1.25	2	80	100	1.5	60	75	-	-	-
M 10	10.000	1.50	2	65	98	1.5	50	75	-	-	-
M 12	12.000	1.75	2	55	96	1.5	40	70	-	-	-
M 14	14.000	2.00	2	45	90	1.5	35	70	-	-	-
M 16	16.000	2.00	2	40	80	1.5	30	60	-	-	-

Application



Material

Hardened tool steel
48 - 52 HRC



Hardened tool steel
52 - 56 HRC



Hardened tool steel
56 - 60 HRC



Hardened tool steel
> 60 HRC



M	d [mm]	P [mm]	v _c 1.5 x d			v _c 2.0 x d			v _c 3.0 x d		
			n [min ⁻¹]	f _f [100%]		n [min ⁻¹]	f _f [100%]		n [min ⁻¹]	f _f [100%]	
M 4	4.000	0.70	8	635	445	6	475	333	4	320	224
M 5	5.000	0.80	8	510	408	6	380	304	4	255	204
M 6	6.000	1.00	8	425	425	6	320	320	4	210	210
M 8	8.000	1.25	8	320	400	6	240	300	4	160	200
M 10	10.000	1.50	8	255	383	6	190	285	4	125	188
M 12	12.000	1.75	8	210	368	6	160	280	4	105	184
M 14	14.000	2.00	8	180	360	6	135	270	4	90	180
M 16	16.000	2.00	8	160	320	6	120	240	4	80	160

M 4	4.000	0.70	6	475	333	4	320	224	3	240	168
M 5	5.000	0.80	6	380	304	4	255	204	3	190	152
M 6	6.000	1.00	6	320	320	4	210	210	3	160	160
M 8	8.000	1.25	6	240	300	4	160	200	3	120	150
M 10	10.000	1.50	6	190	285	4	125	188	3	95	143
M 12	12.000	1.75	6	160	280	4	105	184	3	80	140
M 14	14.000	2.00	6	135	270	4	90	180	3	70	140
M 16	16.000	2.00	6	120	240	4	80	160	3	60	120

M 4	4.000	0.70	4	320	224	2	160	112	-	-	-
M 5	5.000	0.80	4	255	204	2	125	100	-	-	-
M 6	6.000	1.00	4	210	210	2	105	105	-	-	-
M 8	8.000	1.25	4	160	200	2	80	100	-	-	-
M 10	10.000	1.50	4	125	188	2	65	98	-	-	-
M 12	12.000	1.75	4	105	184	2	55	96	-	-	-
M 14	14.000	2.00	4	90	180	2	45	90	-	-	-
M 16	16.000	2.00	4	80	160	2	40	80	-	-	-

M 4	4.000	0.70	2	160	112	1.5	120	84	-	-	-
M 5	5.000	0.80	2	125	100	1.5	95	76	-	-	-
M 6	6.000	1.00	2	105	105	1.5	80	80	-	-	-
M 8	8.000	1.25	2	80	100	1.5	60	75	-	-	-
M 10	10.000	1.50	2	65	98	1.5	50	75	-	-	-
M 12	12.000	1.75	2	55	96	1.5	40	70	-	-	-
M 14	14.000	2.00	2	45	90	1.5	35	70	-	-	-
M 16	16.000	2.00	2	40	80	1.5	30	60	-	-	-

Taps durotap H



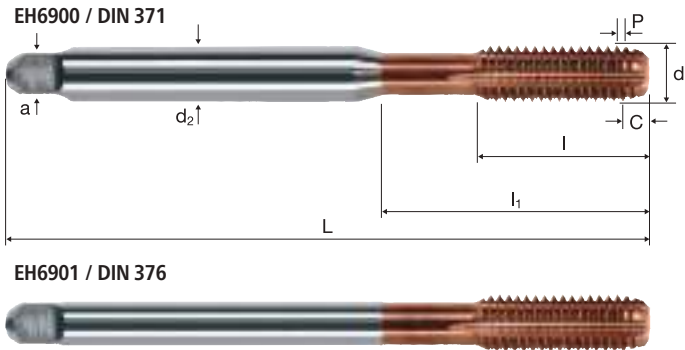
M

**ISO 2
(6H)**

**HM
MG10**

**DIN
371/376**

Form C



					HRC 48-56	HRC 56-60	HRC > 60			
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M
MF
G
UN
EG

Example: Order-N°.										Article-N°.		α-Code				AICrTiN	
										EH6900		058				EH6900	
Ø Code	d	P	L	l	l ₁	d ₂	a										
058	M 4	0.70	63	13.00	21.0	4.5	3.4	4	3.40								●
084	M 5	0.80	70	15.00	25.0	6.0	4.9	4	4.30								●
088	M 6	1.00	80	17.00	30.0	6.0	4.9	4	5.10								●
160	M 8	1.25	90	20.00	35.0	8.0	6.2	5	6.90								●
174	M 10	1.50	100	22.00	39.0	10.0	8.0	5	8.60								●

Example: Order-N°.										Article-N°.		α-Code				AICrTiN	
										EH6901		240				EH6901	
Ø Code	d	P	L	l	l ₁	d ₂	a										
240	M 12	1.75	110	24.00	40.0	9.0	7.0	5	10.40								●
244	M 14	2.00	110	26.00	40.0	11.0	9.0	5	12.20								●
246	M 16	2.00	110	27.00	40.0	12.0	9.0	5	14.20								●

Application	Material	M	d [mm]	P [mm]	v_c 1.0xd	n [min ⁻¹]	v_f [100%]	v_c 1.5xd	n [min ⁻¹]	v_f [100%]	v_c 2.0xd	n [min ⁻¹]	v_f [100%]
	Cast iron GG	M 2	2.000	0.40	28	4455	1782	24	3820	1528	20	3185	1274
		M 2.5	2.500	0.45	28	3565	1604	24	3055	1375	20	2545	1145
		M 3	3.000	0.50	28	2970	1485	24	2545	1273	20	2120	1060
		M 4	4.000	0.70	28	2230	1561	24	1910	1337	20	1590	1113
		M 5	5.000	0.80	28	1785	1428	24	1530	1224	20	1275	1020
		M 6	6.000	1.00	28	1485	1485	24	1275	1275	20	1060	1060
		M 8	8.000	1.25	28	1115	1394	24	955	1194	20	795	994
		M 10	10.000	1.50	28	890	1335	24	765	1148	20	635	953
		M 12	12.000	1.75	28	745	1304	24	635	1111	20	530	928
		M 14	14.000	2.00	28	635	1270	24	545	1090	20	455	910
		M 16	16.000	2.00	28	555	1110	24	475	950	20	400	800
		M 18	18.000	2.50	28	495	1238	24	425	1063	20	355	888
	Cast iron GG	M 20	20.000	2.50	28	445	1113	24	380	950	20	320	800
		M 22	22.000	2.50	28	405	1013	24	345	863	20	290	725
		M 24	24.000	3.00	28	370	1110	24	320	960	20	265	795
	Cast iron GGG	M 2	2.000	0.40	20	3185	1274	18	2865	1146	15	2385	954
		M 2.5	2.500	0.45	20	2545	1145	18	2290	1031	15	1910	860
		M 3	3.000	0.50	20	2120	1060	18	1910	955	15	1590	795
		M 4	4.000	0.70	20	1590	1113	18	1430	1001	15	1195	837
		M 5	5.000	0.80	20	1275	1020	18	1145	916	15	955	764
		M 6	6.000	1.00	20	1060	1060	18	955	955	15	795	795
		M 8	8.000	1.25	20	795	994	18	715	894	15	595	744
		M 10	10.000	1.50	20	635	953	18	575	863	15	475	713
		M 12	12.000	1.75	20	530	928	18	475	831	15	400	700
		M 14	14.000	2.00	20	455	910	18	410	820	15	340	680
		M 16	16.000	2.00	20	400	800	18	360	720	15	300	600
		M 18	18.000	2.50	20	355	888	18	320	800	15	265	663
	Cast iron GGG	M 20	20.000	2.50	20	320	800	18	285	713	15	240	600
		M 22	22.000	2.50	20	290	725	18	260	650	15	215	538
		M 24	24.000	3.00	20	265	795	18	240	720	15	200	600

Application	Material	M	d [mm]	P [mm]	v_c 1.5xd	n [min ⁻¹]	v_f [100%]	v_c 2.0xd	n [min ⁻¹]	v_f [100%]	v_c 3.0xd	n [min ⁻¹]	v_f [100%]
	Cast iron GG	M 2	2.000	0.40	30	4775	1910	28	4455	1782	25	3980	1592
		M 2.5	2.500	0.45	30	3820	1719	28	3565	1604	25	3185	1433
		M 3	3.000	0.50	30	3185	1593	28	2970	1485	25	2655	1328
		M 4	4.000	0.70	30	2385	1670	28	2230	1561	25	1990	1393
		M 5	5.000	0.80	30	1910	1528	28	1785	1428	25	1590	1272
		M 6	6.000	1.00	30	1590	1590	28	1485	1485	25	1325	1325
		M 8	8.000	1.25	30	1195	1494	28	1115	1394	25	995	1244
		M 10	10.000	1.50	30	955	1433	28	890	1335	25	795	1193
		M 12	12.000	1.75	30	795	1391	28	745	1304	25	665	1164
		M 14	14.000	2.00	30	680	1360	28	635	1270	25	570	1140
		M 16	16.000	2.00	30	595	1190	28	555	1110	25	495	990
		M 18	18.000	2.50	30	530	1325	28	495	1238	25	440	1100
	Cast iron GG	M 20	20.000	2.50	30	475	1188	28	445	1113	25	400	1000
		M 22	22.000	2.50	30	435	1088	28	405	1013	25	360	900
		M 24	24.000	3.00	30	400	1200	28	370	1110	25	330	990
	Cast iron GGG	M 2	2.000	0.40	25	3980	1592	22	3500	1400	20	3185	1274
		M 2.5	2.500	0.45	25	3185	1433	22	2800	1260	20	2545	1145
		M 3	3.000	0.50	25	2655	1328	22	2335	1168	20	2120	1060
		M 4	4.000	0.70	25	1990	1393	22	1750	1225	20	1590	1113
		M 5	5.000	0.80	25	1590	1272	22	1400	1120	20	1275	1020
		M 6	6.000	1.00	25	1325	1325	22	1165	1165	20	1060	1060
		M 8	8.000	1.25	25	995	1244	22	875	1094	20	795	994
		M 10	10.000	1.50	25	795	1193	22	700	1050	20	635	953
		M 12	12.000	1.75	25	665	1164	22	585	1024	20	530	928
		M 14	14.000	2.00	25	570	1140	22	500	1000	20	455	910
		M 16	16.000	2.00	25	495	990	22	440	880	20	400	800
		M 18	18.000	2.50	25	440	1100	22	390	975	20	355	888
	Cast iron GGG	M 20	20.000	2.50	25	400	1000	22	350	875	20	320	800
		M 22	22.000	2.50	25	360	900	22	320	800	20	290	725
		M 24	24.000	3.00	25	330	990	22	290	870	20	265	795

Taps c-tap

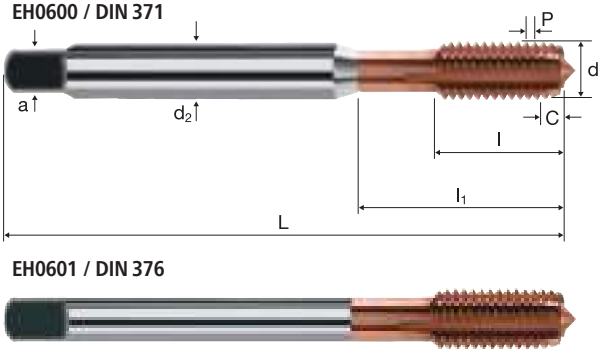


M

ISO 2
(6H)

HSS
PM/F

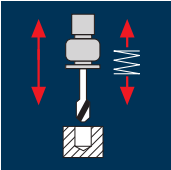
X - P
Form C



											GG(G)
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Example: Order-N°.										Article-N°.		α-Code						AICrTiN	
										EH0600		034						EH0600	
Ø Code	d	P	L	l	l ₁	d ₂	a												
034	M 2	0.40	45	8.00	-	2.8	2.1	3	1.60									●	
040	M 2.5	0.45	50	9.00	-	2.8	2.1	3	2.05									●	
044	M 3	0.50	56	12.00	18.0	3.5	2.7	3	2.50									●	
058	M 4	0.70	63	13.00	21.0	4.5	3.4	3	3.30									●	
084	M 5	0.80	70	15.00	25.0	6.0	4.9	3	4.20									●	
088	M 6	1.00	80	17.00	30.0	6.0	4.9	4	5.00									●	
160	M 8	1.25	90	20.00	35.0	8.0	6.2	4	6.80									●	
174	M 10	1.50	100	22.00	39.0	10.0	8.0	4	8.50									●	

Example: Order-N°.										Article-N°.		α-Code						AICrTiN	
										EH0601		240						EH0601	
Ø Code	d	P	L	l	l ₁	d ₂	a												
240	M 12	1.75	110	24.00	40.0	9.0	7.0	4	10.20									●	
244	M 14	2.00	110	26.00	40.0	11.0	9.0	4	12.00									●	
246	M 16	2.00	110	27.00	40.0	12.0	9.0	4	14.00									●	
312	M 18	2.50	125	30.00	45.0	14.0	11.0	4	15.50									●	
314	M 20	2.50	140	32.00	50.0	16.0	12.0	4	17.50									●	
316	M 22	2.50	140	32.00	50.0	18.0	14.5	5	19.50									●	
320	M 24	3.00	160	34.00	60.0	18.0	14.5	5	21.00									●	

Application	Material									
	Cast iron GG	M 3	3.000	0.50	80	8490	70	7425	50	5305
		M 4	4.000	0.70	80	6365	70	5570	50	3980
		M 5	5.000	0.80	80	5095	70	4455	50	3185
		M 6	6.000	1.00	80	4245	70	3715	50	2655
		M 8	8.000	1.25	80	3185	70	2785	50	1990
		M 10	10.000	1.50	80	2545	70	2230	50	1590
		M 12	12.000	1.75	80	2120	70	1855	50	1325
	Cast iron GGG	M 3	3.000	0.50	60	6365	40	4245	30	3185
		M 4	4.000	0.70	60	4775	40	3185	30	2385
		M 5	5.000	0.80	60	3820	40	2545	30	1910
		M 6	6.000	1.00	60	3185	40	2120	30	1590
		M 8	8.000	1.25	60	2385	40	1590	30	1195
		M 10	10.000	1.50	60	1910	40	1275	30	955
		M 12	12.000	1.75	60	1590	40	1060	30	795

Taps durotap GG-R

Incool

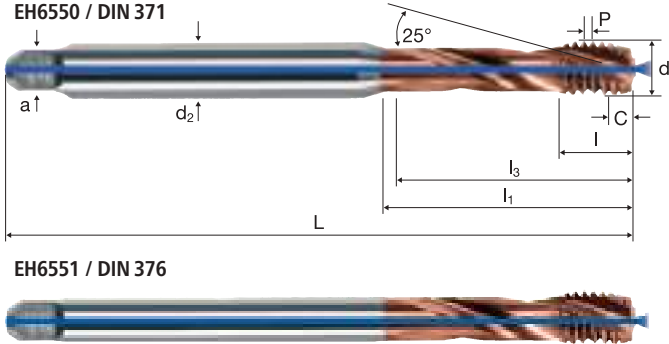


M

ISO 2
(6H)

HM
MG10

Form C

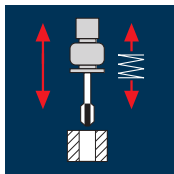


												GG(G)
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Example: Order-N°.											AICrTiN	
Article-N°.											EH6550	
α-Code												
Ø Code	d	P	L	l	l ₁	l ₃	d ₂	a				
044*	M 3	0.50	56	5.00	18.0	16.0	3.5	2.7	3	2.50		●
058*	M 4	0.70	63	7.00	21.0	19.0	4.5	3.4	3	3.30		●
084*	M 5	0.80	70	8.00	25.0	23.0	6.0	4.9	3	4.20		●
088	M 6	1.00	80	10.00	30.0	28.0	6.0	4.9	3	5.00		●
160	M 8	1.25	90	13.00	35.0	33.0	8.0	6.2	3	6.80		●
174	M 10	1.50	100	15.00	39.0	37.0	10.0	8.0	3	8.50		●

Example: Order-N°.											AICrTiN	
Article-N°.											EH6551	
α-Code												
Ø Code	d	P	L	l	l ₁	l ₃	d ₂	a				
240	M 12	1.75	110	18.00	50.0	48.0	9.0	7.0	3	10.20		●
* without internal cooling												

Application



Material

Unalloyed aluminium



Unalloyed aluminium



Wrought aluminium alloys Si < 6% not hardened



Wrought aluminium alloys Si < 6% not hardened



Wrought aluminium alloys Si < 6% hardened



Wrought aluminium alloys Si < 6% hardened



Unalloyed copper



Unalloyed copper



M	d [mm]	P [mm]	v_c 1.5 x d			v_c 2.0 x d			v_c 3.0 x d		
			n [min ⁻¹]	f _r [100%]		n [min ⁻¹]	f _r [100%]		n [min ⁻¹]	f _r [100%]	
M 2	2.000	0.40	23	3660	1464	19	3025	1210	16	2545	1018
M 2.5	2.500	0.45	23	2930	1319	19	2420	1089	16	2035	916
M 3	3.000	0.50	23	2440	1220	19	2015	1008	16	1700	850
M 4	4.000	0.70	23	1830	1281	19	1510	1057	16	1275	893
M 5	5.000	0.80	23	1465	1172	19	1210	968	16	1020	816
M 6	6.000	1.00	23	1220	1220	19	1010	1010	16	850	850
M 8	8.000	1.25	23	915	1144	19	755	944	16	635	794
M 10	10.000	1.50	23	730	1095	19	605	908	16	510	765
M 12	12.000	1.75	23	610	1068	19	505	884	16	425	744
M 14	14.000	2.00	23	525	1050	19	430	860	16	365	730
M 16	16.000	2.00	23	460	920	19	380	760	16	320	640
M 18	18.000	2.50	23	405	1013	19	335	838	16	285	713
M 20	20.000	2.50	23	365	913	19	300	750	16	255	638
M 22	22.000	2.50	23	335	838	19	275	688	16	230	575
M 24	24.000	3.00	23	305	915	19	250	750	16	210	630
M 2	2.000	0.40	35	5570	2228	30	4775	1910	25	3980	1592
M 2.5	2.500	0.45	35	4455	2005	30	3820	1719	25	3185	1433
M 3	3.000	0.50	35	3715	1858	30	3185	1593	25	2655	1328
M 4	4.000	0.70	35	2785	1950	30	2385	1670	25	1990	1393
M 5	5.000	0.80	35	2230	1784	30	1910	1528	25	1590	1272
M 6	6.000	1.00	35	1855	1855	30	1590	1590	25	1325	1325
M 8	8.000	1.25	35	1395	1744	30	1195	1494	25	995	1244
M 10	10.000	1.50	35	1115	1673	30	955	1433	25	795	1193
M 12	12.000	1.75	35	930	1628	30	795	1391	25	665	1164
M 14	14.000	2.00	35	795	1590	30	680	1360	25	570	1140
M 16	16.000	2.00	35	695	1390	30	595	1190	25	495	990
M 18	18.000	2.50	35	620	1550	30	530	1325	25	440	1100
M 20	20.000	2.50	35	555	1388	30	475	1188	25	400	1000
M 22	22.000	2.50	35	505	1263	30	435	1088	25	360	900
M 24	24.000	3.00	35	465	1395	30	400	1200	25	330	990
M 2	2.000	0.40	20	3185	1274	17	2705	1082	14	2230	892
M 2.5	2.500	0.45	20	2545	1145	17	2165	974	14	1785	803
M 3	3.000	0.50	20	2120	1060	17	1805	903	14	1485	743
M 4	4.000	0.70	20	1590	1113	17	1355	949	14	1115	781
M 5	5.000	0.80	20	1275	1020	17	1080	864	14	890	712
M 6	6.000	1.00	20	1060	1060	17	900	900	14	745	745
M 8	8.000	1.25	20	795	994	17	675	844	14	555	694
M 10	10.000	1.50	20	635	953	17	540	810	14	445	668
M 12	12.000	1.75	20	530	928	17	450	788	14	370	648
M 14	14.000	2.00	20	455	910	17	385	770	14	320	640
M 16	16.000	2.00	20	400	800	17	340	680	14	280	560
M 18	18.000	2.50	20	355	888	17	300	750	14	250	625
M 20	20.000	2.50	20	320	800	17	270	675	14	225	563
M 22	22.000	2.50	20	290	725	17	245	613	14	205	513
M 24	24.000	3.00	20	265	795	17	225	675	14	185	555
M 2	2.000	0.40	21	3340	1336	18	2865	1146	15	2385	954
M 2.5	2.500	0.45	21	2675	1204	18	2290	1031	15	1910	860
M 3	3.000	0.50	21	2230	1115	18	1910	955	15	1590	795
M 4	4.000	0.70	21	1670	1169	18	1430	1001	15	1195	837
M 5	5.000	0.80	21	1335	1068	18	1145	916	15	955	764
M 6	6.000	1.00	21	1115	1115	18	955	955	15	795	795
M 8	8.000	1.25	21	835	1044	18	715	894	15	595	744
M 10	10.000	1.50	21	670	1005	18	575	863	15	475	713
M 12	12.000	1.75	21	555	971	18	475	831	15	400	700
M 14	14.000	2.00	21	475	950	18	410	820	15	340	680
M 16	16.000	2.00	21	420	840	18	360	720	15	300	600
M 18	18.000	2.50	21	370	925	18	320	800	15	265	663
M 20	20.000	2.50	21	335	838	18	285	713	15	240	600
M 22	22.000	2.50	21	305	763	18	260	650	15	215	538
M 24	24.000	3.00	21	280	840	18	240	720	15	200	600

Taps



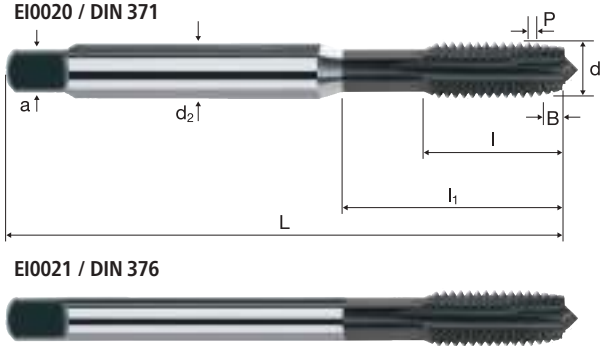
M

ISO 2
(6H)

HSS
PM/F

DIN
371/376

Form B



Al
Aluminium
> 99%

Al
Aluminium
Alloy

Al
Aluminium
Cast

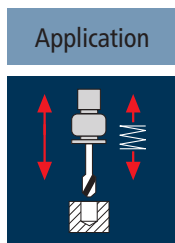
Cu
Copper

Plastic
Thermoplast

M
MF
G
UN
EG

Example: Order-Nº. EI0020 Article-Nº. 034 α-Code										INTEGRAL	
										EI0020	
Ø Code	d	P	L	l	l ₁	d ₂	a				
034	M 2	0.40	45	8.00	-	2.8	2.1	2	1.60		●
040	M 2.5	0.45	50	9.00	-	2.8	2.1	2	2.05		●
044	M 3	0.50	56	12.00	18.0	3.5	2.7	2	2.50		●
058	M 4	0.70	63	13.00	21.0	4.5	3.4	2	3.30		●
084	M 5	0.80	70	15.00	25.0	6.0	4.9	2	4.20		●
088	M 6	1.00	80	17.00	30.0	6.0	4.9	2	5.00		●
160	M 8	1.25	90	20.00	35.0	8.0	6.2	2	6.80		●
174	M 10	1.50	100	22.00	39.0	10.0	8.0	2	8.50		●

Example: Order-Nº. EI0021 Article-Nº. 240 α-Code										INTEGRAL	
										EI0021	
Ø Code	d	P	L	l	l ₁	d ₂	a				
240	M 12	1.75	110	24.00	40.0	9.0	7.0	3	10.20		●
244	M 14	2.00	110	26.00	40.0	11.0	9.0	3	12.00		●
246	M 16	2.00	110	27.00	40.0	12.0	9.0	3	14.00		●
312	M 18	2.50	125	30.00	45.0	14.0	11.0	3	15.50		●
314	M 20	2.50	140	32.00	50.0	16.0	12.0	3	17.50		●
316	M 22	2.50	140	32.00	50.0	18.0	14.5	3	19.50		●
320	M 24	3.00	160	34.00	60.0	18.0	14.5	3	21.00		●



Application

Material

Unalloyed aluminium

Wrought aluminium alloys
Si < 6%
not hardened

Wrought aluminium alloys
Si < 6%
not hardened

Wrought aluminium alloys
Si < 6%
hardened

Wrought aluminium alloys
Si < 6%
hardened

Unalloyed copper

Unalloyed copper

M	d [mm]	P [mm]	v _c 1.0 x d			v _c 1.5 x d			v _c 2.0 x d		
			n [min ⁻¹]	f _f [100%]		n [min ⁻¹]	f _f [100%]		n [min ⁻¹]	f _f [100%]	
M 2	2.000	0.40	25	3980	1592	21	3340	1336	17	2705	1082
M 2.5	2.500	0.45	25	3185	1433	21	2675	1204	17	2165	974
M 3	3.000	0.50	25	2655	1328	21	2230	1115	17	1805	903
M 4	4.000	0.70	25	1990	1393	21	1670	1169	17	1355	949
M 5	5.000	0.80	25	1590	1272	21	1335	1068	17	1080	864
M 6	6.000	1.00	25	1325	1325	21	1115	1115	17	900	900
M 8	8.000	1.25	25	995	1244	21	835	1044	17	675	844
M 10	10.000	1.50	25	795	1193	21	670	1005	17	540	810
M 12	12.000	1.75	25	665	1164	21	555	971	17	450	788
M 14	14.000	2.00	25	570	1140	21	475	950	17	385	770
M 16	16.000	2.00	25	495	990	21	420	840	17	340	680
M 18	18.000	2.50	25	440	1100	21	370	925	17	300	750
M 20	20.000	2.50	25	400	1000	21	335	838	17	270	675
M 22	22.000	2.50	25	360	900	21	305	763	17	245	613
M 24	24.000	3.00	25	330	990	21	280	840	17	225	675
M 2	2.000	0.40	27	4295	1718	24	3820	1528	18	2865	1146
M 2.5	2.500	0.45	27	3440	1548	24	3055	1375	18	2290	1031
M 3	3.000	0.50	27	2865	1433	24	2545	1273	18	1910	955
M 4	4.000	0.70	27	2150	1505	24	1910	1337	18	1430	1001
M 5	5.000	0.80	27	1720	1376	24	1530	1224	18	1145	916
M 6	6.000	1.00	27	1430	1430	24	1275	1275	18	955	955
M 8	8.000	1.25	27	1075	1344	24	955	1194	18	715	894
M 10	10.000	1.50	27	860	1290	24	765	1148	18	575	863
M 12	12.000	1.75	27	715	1251	24	635	1111	18	475	831
M 14	14.000	2.00	27	615	1230	24	545	1090	18	410	820
M 16	16.000	2.00	27	535	1070	24	475	950	18	360	720
M 18	18.000	2.50	27	475	1188	24	425	1063	18	320	800
M 20	20.000	2.50	27	430	1075	24	380	950	18	285	713
M 22	22.000	2.50	27	390	975	24	345	863	18	260	650
M 24	24.000	3.00	27	360	1080	24	320	960	18	240	720
M 2	2.000	0.40	21	3340	1336	18	2865	1146	15	2385	954
M 2.5	2.500	0.45	21	2675	1204	18	2290	1031	15	1910	860
M 3	3.000	0.50	21	2230	1115	18	1910	955	15	1590	795
M 4	4.000	0.70	21	1670	1169	18	1430	1001	15	1195	837
M 5	5.000	0.80	21	1335	1068	18	1145	916	15	955	764
M 6	6.000	1.00	21	1115	1115	18	955	955	15	795	795
M 8	8.000	1.25	21	835	1044	18	715	894	15	595	744
M 10	10.000	1.50	21	670	1005	18	575	863	15	475	713
M 12	12.000	1.75	21	555	971	18	475	831	15	400	700
M 14	14.000	2.00	21	475	950	18	410	820	15	340	680
M 16	16.000	2.00	21	420	840	18	360	720	15	300	600
M 18	18.000	2.50	21	370	925	18	320	800	15	265	663
M 20	20.000	2.50	21	335	838	18	285	713	15	240	600
M 22	22.000	2.50	21	305	763	18	260	650	15	215	538
M 24	24.000	3.00	21	280	840	18	240	720	15	200	600
M 2	2.000	0.40	20	3185	1274	18	2865	1146	16	2545	1018
M 2.5	2.500	0.45	20	2545	1145	18	2290	1031	16	2035	916
M 3	3.000	0.50	20	2120	1060	18	1910	955	16	1700	850
M 4	4.000	0.70	20	1590	1113	18	1430	1001	16	1275	893
M 5	5.000	0.80	20	1275	1020	18	1145	916	16	1020	816
M 6	6.000	1.00	20	1060	1060	18	955	955	16	850	850
M 8	8.000	1.25	20	795	994	18	715	894	16	635	794
M 10	10.000	1.50	20	635	953	18	575	863	16	510	765
M 12	12.000	1.75	20	530	928	18	475	831	16	425	744
M 14	14.000	2.00	20	455	910	18	410	820	16	365	730
M 16	16.000	2.00	20	400	800	18	360	720	16	320	640
M 18	18.000	2.50	20	355	888	18	320	800	16	285	713
M 20	20.000	2.50	20	320	800	18	285	713	16	255	638
M 22	22.000	2.50	20	290	725	18	260	650	16	230	575
M 24	24.000	3.00	20	265	795	18	240	720	16	210	630

Taps

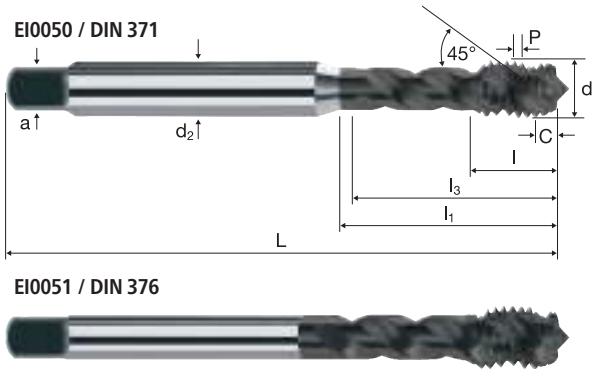


M

ISO 2
(6H)

HSS
PM/F

Form C



Al
Aluminium
> 99%

Al
Aluminium
Alloy

Al
Aluminium
Cast

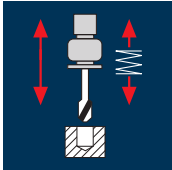
Cu
Copper

Plastic
Thermoplast

M
MF
G
UN
EG

Example: Order-Nº. EI0050 Article-Nº. 034 ø-Code											INTEGRAL
Ø Code	d	P	L	l	l ₁	l ₃	d ₂	a			EI0050
034	M 2	0.40	45	8.00	-	10.5	2.8	2.1	3	1.60	●
040	M 2.5	0.45	50	9.00	-	13.0	2.8	2.1	3	2.05	●
044	M 3	0.50	56	5.00	18.0	16.0	3.5	2.7	3	2.50	●
058	M 4	0.70	63	7.00	21.0	19.0	4.5	3.4	3	3.30	●
084	M 5	0.80	70	8.00	25.0	23.0	6.0	4.9	3	4.20	●
088	M 6	1.00	80	10.00	30.0	28.0	6.0	4.9	3	5.00	●
160	M 8	1.25	90	13.00	35.0	33.0	8.0	6.2	3	6.80	●
174	M 10	1.50	100	15.00	39.0	37.0	10.0	8.0	3	8.50	●

Example: Order-Nº. EI0051 Article-Nº. 240 ø-Code											INTEGRAL
Ø Code	d	P	L	l	l ₁	l ₃	d ₂	a			EI0051
240	M 12	1.75	110	18.00	50.0	48.0	9.0	7.0	3	10.20	●
244	M 14	2.00	110	20.00	58.0	56.0	11.0	9.0	4	12.00	●
246	M 16	2.00	110	20.00	58.0	56.0	12.0	9.0	4	14.00	●
312	M 18	2.50	125	25.00	65.0	63.0	14.0	11.0	4	15.50	●
314	M 20	2.50	140	25.00	72.0	70.0	16.0	12.0	4	17.50	●
316	M 22	2.50	140	25.00	72.0	70.0	18.0	14.5	4	19.50	●
320	M 24	3.00	160	30.00	74.0	72.0	18.0	14.5	4	21.00	●

Application	Material												
		M	d [mm]	P [mm]	v_c 1.0 x d	n [min ⁻¹]	v_f [100%]	v_c 1.5 x d	n [min ⁻¹]	v_f [100%]	v_c 2.0 x d	n [min ⁻¹]	v_f [100%]
		M 4	4.000	0.70	80	6365	4456	60	4775	3343	40	3185	2230
		M 5	5.000	0.80	80	5095	4076	60	3820	3056	40	2545	2036
		M 6	6.000	1.00	80	4245	4245	60	3185	3185	40	2120	2120
		M 8	8.000	1.25	80	3185	3981	60	2385	2981	40	1590	1988
		M 10	10.000	1.50	80	2545	3818	60	1910	2865	40	1275	1913
		M 12	12.000	1.75	80	2120	3710	60	1590	2783	40	1060	1855
		M 14	14.000	2.00	80	1820	3640	60	1365	2730	40	910	1820
		M 16	16.000	2.00	80	1590	3180	60	1195	2390	40	795	1590
CuAlFe (Ampco) 	M 4	4.000	0.70	10	795	557	8	635	445	7	555	389	
	M 5	5.000	0.80	10	635	508	8	510	408	7	445	356	
	M 6	6.000	1.00	10	530	530	8	425	425	7	370	370	
	M 8	8.000	1.25	10	400	500	8	320	400	7	280	350	
	M 10	10.000	1.50	10	320	480	8	255	383	7	225	338	
	M 12	12.000	1.75	10	265	464	8	210	368	7	185	324	
	M 14	14.000	2.00	10	225	450	8	180	360	7	160	320	
	M 16	16.000	2.00	10	200	400	8	160	320	7	140	280	

Incool



M

ISO 2
(6H)



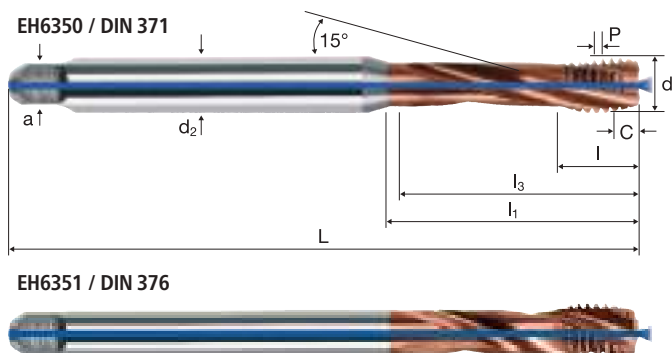
**HM
MG10**



A cross-sectional diagram of a butt joint. Two plates, each 10 mm thick, are joined by a square groove weld. The weld is a square groove weld with a depth of 10 mm. The plates are 10 mm thick. The weld is a square groove weld with a depth of 10 mm.



Form C



EH6351 / DIN 376

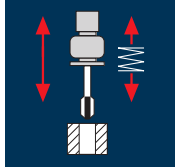
Al
Aluminium
Cast

Cu
Copper

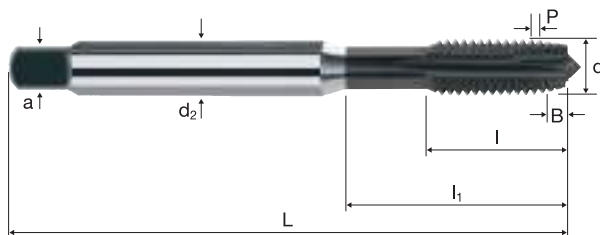
GG(G)

M
MF
G
UN
EG

[illegible][illegible]

Application	Material												
	Titanium alloys > 300 HB [Ti6Al4V] 	M	d [mm]	P [mm]	v_c 1.5 x d [min ⁻¹]	n [min ⁻¹]	v_f [100%]	v_c 2.0 x d [min ⁻¹]	n [min ⁻¹]	v_f [100%]	v_c 3.0 x d [min ⁻¹]	n [min ⁻¹]	v_f [100%]
		M 1.2	1.200	0.25	4	1060	265	3	795	199	2	530	133
		M 1.4	1.400	0.30	4	910	273	3	680	204	2	455	137
		M 1.6	1.600	0.35	4	795	278	3	595	208	2	400	140
		M 1.8	1.800	0.35	4	705	247	3	530	186	2	355	124
		M 2	2.000	0.40	4	635	254	3	475	190	2	320	128
		M 2.5	2.500	0.45	4	510	230	3	380	171	2	255	115
		M 3	3.000	0.50	5	530	265	4	425	213	3	320	160
		M 3.5	3.500	0.60	5	455	273	4	365	219	3	275	165
		M 4	4.000	0.70	5	400	280	4	320	224	3	240	168
	Titanium alloys > 300 HB [Ti6Al4V]	M 5	5.000	0.80	5	320	256	4	255	204	3	190	152
		M 6	6.000	1.00	5	265	265	4	210	210	3	160	160
		M 8	8.000	1.25	5	200	250	4	160	200	3	120	150
		M 10	10.000	1.50	5	160	240	4	125	188	3	95	143

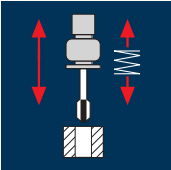
ISO 2
(6H)



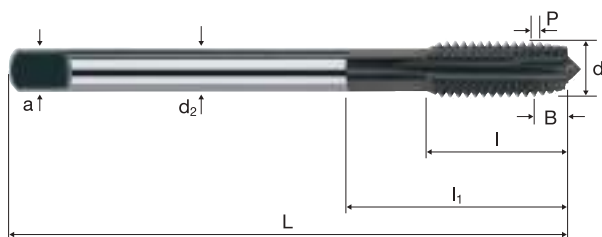
Ti
Titanium

M
MF
G
UN
EG

237

Application		Material													
		Titanium alloys > 300 HB [Ti6Al4V] 		M	d [mm]	P [mm]	v_c 1.5 x d	n [min ⁻¹]	v_f [100%]	v_c 2.0 x d	n [min ⁻¹]	v_f [100%]	v_c 3.0 x d	n [min ⁻¹]	v_f [100%]
				M 12	12.000	1.75	5	135	236	4	105	184	3	80	140
				M 14	14.000	2.00	5	115	230	4	90	180	3	70	140
				M 16	16.000	2.00	5	100	200	4	80	160	3	60	120
				M 18	18.000	2.50	5	90	225	4	70	175	3	55	138
				M 20	20.000	2.50	5	80	200	4	65	163	3	50	125
				M 22	22.000	2.50	5	70	175	4	60	150	3	45	113
				M 24	24.000	3.00	5	65	195	4	55	165	3	40	120

ISO 2
(6H)

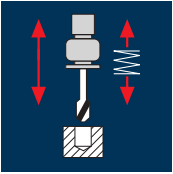


Ti
Titanium

M
MF
G
UN
EG

[illegible]

Application



Material

Titanium alloys
> 300 HB
[Ti6Al4V]

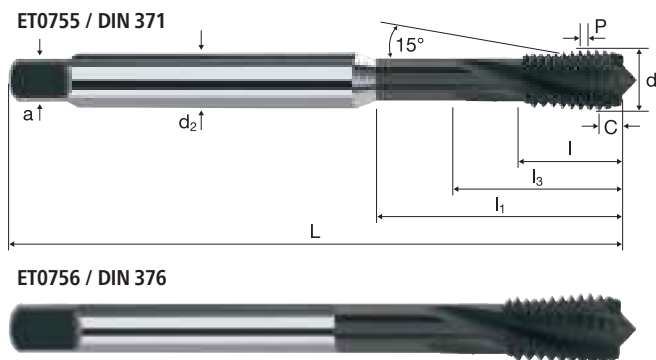


Titanium alloys
> 300 HB
[Ti6Al4V]



M	d [mm]	P [mm]	v _c 1.0xd	n [min ⁻¹]	v _f [100%]	v _c 1.5xd	n [min ⁻¹]	v _f [100%]
M 2	2.000	0.40	4	635	254	3	475	190
M 2.5	2.500	0.45	4	510	230	3	380	171
M 3	3.000	0.50	5	530	265	4	425	213
M 3.5	3.500	0.60	5	455	273	4	365	219
M 4	4.000	0.70	5	400	280	4	320	224
M 5	5.000	0.80	5	320	256	4	255	204
M 6	6.000	1.00	5	265	265	4	210	210
M 8	8.000	1.25	5	200	250	4	160	200
M 10	10.000	1.50	5	160	240	4	125	188
M 12	12.000	1.75	5	135	236	4	105	184
M 14	14.000	2.00	5	115	230	4	90	180
M 16	16.000	2.00	5	100	200	4	80	160
M 18	18.000	2.50	5	90	225	4	70	175
M 20	20.000	2.50	5	80	200	4	65	163
M 22	22.000	2.50	5	70	175	4	60	150
M 24	24.000	3.00	5	65	195	4	55	165

ISO 2
(6H)



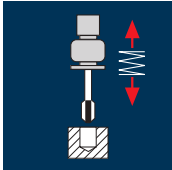
ET0756 / DIN 376

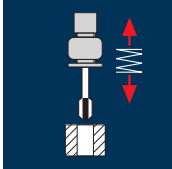
Ti
Titanium

M
MF
G
UN
EG

Example: Order-N°.											TRIBO
Article-N°.											ET0755
ø-Code											034
Ø Code	d	P	L	I	I ₁	I ₃	d ₂	a			
034	M 2	0.40	45	8.00	-	10.5	2.8	2.1	3	1.70*	●
040	M 2.5	0.45	50	9.00	-	13.0	2.8	2.1	3	2.10	●
044	M 3	0.50	56	5.00	18.0	16.0	3.5	2.7	3	2.60*	●
056	M 3.5	0.60	56	6.00	20.0	18.0	4.0	3.0	3	3.00	●
058	M 4	0.70	63	7.00	21.0	19.0	4.5	3.4	3	3.40	●
084	M 5	0.80	70	8.00	25.0	23.0	6.0	4.9	3	4.30	●
088	M 6	1.00	80	10.00	30.0	28.0	6.0	4.9	3	5.10	●
160	M 8	1.25	90	13.00	35.0	33.0	8.0	6.2	3	6.90	●
174	M 10	1.50	100	15.00	39.0	37.0	10.0	8.0	4	8.60	●

Ø Code	Example: Order-N°. Article-N°. ø-Code										TRIBO
	d	P	L	I	I ₁	I ₃	d ₂	a			ET0756
240	M 12	1.75	110	18.00	50.0	48.0	9.0	7.0	4	10.40	●
244	M 14	2.00	110	20.00	58.0	56.0	11.0	9.0	4	12.20	●
246	M 16	2.00	110	20.00	58.0	56.0	12.0	9.0	4	14.20	●
312	M 18	2.50	125	25.00	65.0	63.0	14.0	11.0	5	15.70	●
314	M 20	2.50	140	25.00	72.0	70.0	16.0	12.0	5	17.70	●
316	M 22	2.50	140	25.00	72.0	70.0	18.0	14.5	5	19.70	●
320	M 24	3.00	160	30.00	74.0	72.0	18.0	14.5	5	21.20	●
	* The given dimension core hole drill size is out of norm										

Application	Material																																																																																										
	Nickel base alloys hardened	<table><tr><th>M</th><th>d [mm]</th><th>P [mm]</th><th>v_c 1.0 x d</th><th>n [min⁻¹]</th><th>v_f [100%]</th><th>v_c 1.5 x d</th><th>n [min⁻¹]</th><th>v_f [100%]</th></tr><tr><td>M 3</td><td>3.000</td><td>0.50</td><td>2</td><td>210</td><td>105</td><td>2</td><td>210</td><td>105</td></tr><tr><td>M 4</td><td>4.000</td><td>0.70</td><td>2</td><td>160</td><td>112</td><td>2</td><td>160</td><td>112</td></tr><tr><td>M 5</td><td>5.000</td><td>0.80</td><td>2</td><td>125</td><td>100</td><td>2</td><td>125</td><td>100</td></tr><tr><td>M 6</td><td>6.000</td><td>1.00</td><td>2</td><td>105</td><td>105</td><td>2</td><td>105</td><td>105</td></tr><tr><td>M 8</td><td>8.000</td><td>1.25</td><td>2</td><td>80</td><td>100</td><td>2</td><td>80</td><td>100</td></tr><tr><td>M 10</td><td>10.000</td><td>1.50</td><td>2</td><td>65</td><td>98</td><td>2</td><td>65</td><td>98</td></tr><tr><td>M 12</td><td>12.000</td><td>1.75</td><td>2</td><td>55</td><td>96</td><td>2</td><td>55</td><td>96</td></tr><tr><td>M 16</td><td>16.000</td><td>2.00</td><td>2</td><td>40</td><td>80</td><td>2</td><td>40</td><td>80</td></tr></table>									M	d [mm]	P [mm]	v_c 1.0 x d	n [min ⁻¹]	v_f [100%]	v_c 1.5 x d	n [min ⁻¹]	v_f [100%]	M 3	3.000	0.50	2	210	105	2	210	105	M 4	4.000	0.70	2	160	112	2	160	112	M 5	5.000	0.80	2	125	100	2	125	100	M 6	6.000	1.00	2	105	105	2	105	105	M 8	8.000	1.25	2	80	100	2	80	100	M 10	10.000	1.50	2	65	98	2	65	98	M 12	12.000	1.75	2	55	96	2	55	96	M 16	16.000	2.00	2	40	80	2	40	80
	M	d [mm]	P [mm]	v_c 1.0 x d	n [min ⁻¹]	v_f [100%]	v_c 1.5 x d	n [min ⁻¹]	v_f [100%]																																																																																		
M 3	3.000	0.50	2	210	105	2	210	105																																																																																			
M 4	4.000	0.70	2	160	112	2	160	112																																																																																			
M 5	5.000	0.80	2	125	100	2	125	100																																																																																			
M 6	6.000	1.00	2	105	105	2	105	105																																																																																			
M 8	8.000	1.25	2	80	100	2	80	100																																																																																			
M 10	10.000	1.50	2	65	98	2	65	98																																																																																			
M 12	12.000	1.75	2	55	96	2	55	96																																																																																			
M 16	16.000	2.00	2	40	80	2	40	80																																																																																			
	Nickel base alloys not hardened	<table><tr><td>M 3</td><td>3.000</td><td>0.50</td><td>3</td><td>320</td><td>160</td><td>2</td><td>210</td><td>105</td></tr><tr><td>M 4</td><td>4.000</td><td>0.70</td><td>3</td><td>240</td><td>168</td><td>2</td><td>160</td><td>112</td></tr><tr><td>M 5</td><td>5.000</td><td>0.80</td><td>3</td><td>190</td><td>152</td><td>2</td><td>125</td><td>100</td></tr><tr><td>M 6</td><td>6.000</td><td>1.00</td><td>3</td><td>160</td><td>160</td><td>2</td><td>105</td><td>105</td></tr><tr><td>M 8</td><td>8.000</td><td>1.25</td><td>3</td><td>120</td><td>150</td><td>2</td><td>80</td><td>100</td></tr><tr><td>M 10</td><td>10.000</td><td>1.50</td><td>3</td><td>95</td><td>143</td><td>2</td><td>65</td><td>98</td></tr><tr><td>M 12</td><td>12.000</td><td>1.75</td><td>3</td><td>80</td><td>140</td><td>2</td><td>55</td><td>96</td></tr><tr><td>M 16</td><td>16.000</td><td>2.00</td><td>3</td><td>60</td><td>120</td><td>2</td><td>40</td><td>80</td></tr></table>									M 3	3.000	0.50	3	320	160	2	210	105	M 4	4.000	0.70	3	240	168	2	160	112	M 5	5.000	0.80	3	190	152	2	125	100	M 6	6.000	1.00	3	160	160	2	105	105	M 8	8.000	1.25	3	120	150	2	80	100	M 10	10.000	1.50	3	95	143	2	65	98	M 12	12.000	1.75	3	80	140	2	55	96	M 16	16.000	2.00	3	60	120	2	40	80									
M 3	3.000	0.50	3	320	160	2	210	105																																																																																			
M 4	4.000	0.70	3	240	168	2	160	112																																																																																			
M 5	5.000	0.80	3	190	152	2	125	100																																																																																			
M 6	6.000	1.00	3	160	160	2	105	105																																																																																			
M 8	8.000	1.25	3	120	150	2	80	100																																																																																			
M 10	10.000	1.50	3	95	143	2	65	98																																																																																			
M 12	12.000	1.75	3	80	140	2	55	96																																																																																			
M 16	16.000	2.00	3	60	120	2	40	80																																																																																			

Application	Material																																																																																										
	Nickel base alloys hardened	<table><tr><th>M</th><th>d [mm]</th><th>P [mm]</th><th>v_c 1.0 x d</th><th>n [min⁻¹]</th><th>v_f [100%]</th><th>v_c 1.5 x d</th><th>n [min⁻¹]</th><th>v_f [100%]</th></tr><tr><td>M 3</td><td>3.000</td><td>0.50</td><td>2</td><td>210</td><td>105</td><td>2</td><td>210</td><td>105</td></tr><tr><td>M 4</td><td>4.000</td><td>0.70</td><td>2</td><td>160</td><td>112</td><td>2</td><td>160</td><td>112</td></tr><tr><td>M 5</td><td>5.000</td><td>0.80</td><td>2</td><td>125</td><td>100</td><td>2</td><td>125</td><td>100</td></tr><tr><td>M 6</td><td>6.000</td><td>1.00</td><td>2</td><td>105</td><td>105</td><td>2</td><td>105</td><td>105</td></tr><tr><td>M 8</td><td>8.000</td><td>1.25</td><td>2</td><td>80</td><td>100</td><td>2</td><td>80</td><td>100</td></tr><tr><td>M 10</td><td>10.000</td><td>1.50</td><td>2</td><td>65</td><td>98</td><td>2</td><td>65</td><td>98</td></tr><tr><td>M 12</td><td>12.000</td><td>1.75</td><td>2</td><td>55</td><td>96</td><td>2</td><td>55</td><td>96</td></tr><tr><td>M 16</td><td>16.000</td><td>2.00</td><td>2</td><td>40</td><td>80</td><td>2</td><td>40</td><td>80</td></tr></table>									M	d [mm]	P [mm]	v_c 1.0 x d	n [min ⁻¹]	v_f [100%]	v_c 1.5 x d	n [min ⁻¹]	v_f [100%]	M 3	3.000	0.50	2	210	105	2	210	105	M 4	4.000	0.70	2	160	112	2	160	112	M 5	5.000	0.80	2	125	100	2	125	100	M 6	6.000	1.00	2	105	105	2	105	105	M 8	8.000	1.25	2	80	100	2	80	100	M 10	10.000	1.50	2	65	98	2	65	98	M 12	12.000	1.75	2	55	96	2	55	96	M 16	16.000	2.00	2	40	80	2	40	80
	M	d [mm]	P [mm]	v_c 1.0 x d	n [min ⁻¹]	v_f [100%]	v_c 1.5 x d	n [min ⁻¹]	v_f [100%]																																																																																		
M 3	3.000	0.50	2	210	105	2	210	105																																																																																			
M 4	4.000	0.70	2	160	112	2	160	112																																																																																			
M 5	5.000	0.80	2	125	100	2	125	100																																																																																			
M 6	6.000	1.00	2	105	105	2	105	105																																																																																			
M 8	8.000	1.25	2	80	100	2	80	100																																																																																			
M 10	10.000	1.50	2	65	98	2	65	98																																																																																			
M 12	12.000	1.75	2	55	96	2	55	96																																																																																			
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M 3	3.000	0.50	3	320	160	2	210	105																																																																																			
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M 6	6.000	1.00	3	160	160	2	105	105																																																																																			
M 8	8.000	1.25	3	120	150	2	80	100																																																																																			
M 10	10.000	1.50	3	95	143	2	65	98																																																																																			
M 12	12.000	1.75	3	80	140	2	55	96																																																																																			
M 16	16.000	2.00	3	60	120	2	40	80																																																																																			

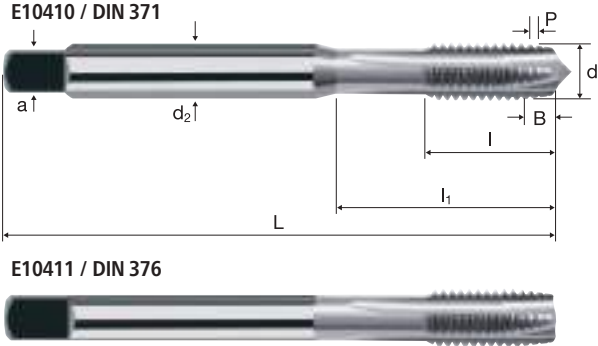


M

ISO 2
(6H)

HSS
PM/F

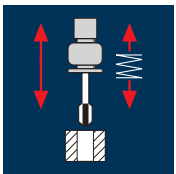
X - P
Form B



Nickel-Alloys

Example: Order-N°. E10410 Article-N°. 044 α-Code 044											E10410	
Ø Code	d	P	L	l	l ₁	d ₂	a					
044	M 3	0.50	56	10.00	18.0	3.5	2.7	3	2.60*	●		
058	M 4	0.70	63	12.00	21.0	4.5	3.4	3	3.40	●		
084	M 5	0.80	70	14.00	25.0	6.0	4.9	3	4.30	●		
088	M 6	1.00	80	16.00	30.0	6.0	4.9	3	5.10	●		
160	M 8	1.25	90	17.00	35.0	8.0	6.2	4	6.90	●		
174	M 10	1.50	100	20.00	39.0	10.0	8.0	4	8.60	●		

Example: Order-N°. E10411 Article-N°. 240 α-Code 240											E10411	
Ø Code	d	P	L	l	l ₁	d ₂	a					
240	M 12	1.75	110	24.00	49.0	9.0	7.0	4	10.40	●		
246	M 16	2.00	110	26.00	54.0	12.0	9.0	4	14.20	●		
* The given dimension core hole drill size is out of norm												

Application	Material	M	d [mm]	P [mm]	v_c 1.5 x d	n [min ⁻¹]	v_f [100%]	v_c 2.0 x d	n [min ⁻¹]	v_f [100%]	v_c 3.0 x d	n [min ⁻¹]	v_f [100%]
	Steel < 500 N/mm ² 	M 1	1.000	0.25	14	4455	1114	12	3820	955	10	3185	796
		M 1.2	1.200	0.25	14	3715	929	12	3185	796	10	2655	664
		M 1.4	1.400	0.30	14	3185	956	12	2730	819	10	2275	683
		M 1.6	1.600	0.35	14	2785	975	12	2385	835	10	1990	697
		M 1.8	1.800	0.35	14	2475	866	12	2120	742	10	1770	620
		M 2	2.000	0.40	14	2230	892	12	1910	764	10	1590	636
		M 2.2	2.200	0.45	14	2025	911	12	1735	781	10	1445	650
		M 2.3	2.300	0.40	14	1940	776	12	1660	664	10	1385	554
		M 2.5	2.500	0.45	14	1785	803	12	1530	689	10	1275	574
		M 2.6	2.600	0.45	18	2205	992	15	1835	826	12	1470	662
Steel < 500 N/mm ² 	M 3	3.000	0.50	18	1910	955	15	1590	795	12	1275	638	
	M 3.5	3.500	0.60	18	1635	981	15	1365	819	12	1090	654	
	M 4	4.000	0.70	18	1430	1001	15	1195	837	12	955	669	
	M 4.5	4.500	0.75	18	1275	956	15	1060	795	12	850	638	
	M 5	5.000	0.80	18	1145	916	15	955	764	12	765	612	
	M 6	6.000	1.00	18	955	955	15	795	795	12	635	635	
	M 8	8.000	1.25	18	715	894	15	595	744	12	475	594	
	M 10	10.000	1.50	18	575	863	15	475	713	12	380	570	
	M 1	1.000	0.25	12	3820	955	8	2545	636	6	1910	478	
	M 1.2	1.200	0.25	12	3185	796	8	2120	530	6	1590	398	
Steel 500 - 850 N/mm ² 	M 1.4	1.400	0.30	12	2730	819	8	1820	546	6	1365	410	
	M 1.6	1.600	0.35	12	2385	835	8	1590	557	6	1195	418	
	M 1.8	1.800	0.35	12	2120	742	8	1415	495	6	1060	371	
	M 2	2.000	0.40	12	1910	764	8	1275	510	6	955	382	
	M 2.2	2.200	0.45	12	1735	781	8	1155	520	6	870	392	
	M 2.3	2.300	0.40	12	1660	664	8	1105	442	6	830	332	
	M 2.5	2.500	0.45	12	1530	689	8	1020	459	6	765	344	
	M 2.6	2.600	0.45	15	1835	826	10	1225	551	8	980	441	
	M 3	3.000	0.50	15	1590	795	10	1060	530	8	850	425	
	M 3.5	3.500	0.60	15	1365	819	10	910	546	8	730	438	
Steel 500 - 850 N/mm ² 	M 4	4.000	0.70	15	1195	837	10	795	557	8	635	445	
	M 4.5	4.500	0.75	15	1060	795	10	705	529	8	565	424	
	M 5	5.000	0.80	15	955	764	10	635	508	8	510	408	
	M 6	6.000	1.00	15	795	795	10	530	530	8	425	425	
	M 8	8.000	1.25	15	595	744	10	400	500	8	320	400	
	M 10	10.000	1.50	15	475	713	10	320	480	8	255	383	
	M 1	1.000	0.25	12	3820	955	10	3185	796	8	2545	636	
	M 1.2	1.200	0.25	12	3185	796	10	2655	664	8	2120	530	
	M 1.4	1.400	0.30	12	2730	819	10	2275	683	8	1820	546	
	M 1.6	1.600	0.35	12	2385	835	10	1990	697	8	1590	557	
Wrought aluminium alloys Si < 6% hardened 	M 1.8	1.800	0.35	12	2120	742	10	1770	620	8	1415	495	
	M 2	2.000	0.40	12	1910	764	10	1590	636	8	1275	510	
	M 2.2	2.200	0.45	12	1735	781	10	1445	650	8	1155	520	
	M 2.3	2.300	0.40	12	1660	664	10	1385	554	8	1105	442	
	M 2.5	2.500	0.45	12	1530	689	10	1275	574	8	1020	459	
	M 2.6	2.600	0.45	15	1835	826	12	1470	662	10	1225	551	
	M 3	3.000	0.50	15	1590	795	12	1275	638	10	1060	530	
	M 3.5	3.500	0.60	15	1365	819	12	1090	654	10	910	546	
	M 4	4.000	0.70	15	1195	837	12	955	669	10	795	557	
	M 4.5	4.500	0.75	15	1060	795	12	850	638	10	705	529	
Wrought aluminium alloys Si < 6% hardened 	M 5	5.000	0.80	15	955	764	12	765	612	10	635	508	
	M 6	6.000	1.00	15	795	795	12	635	635	10	530	530	
	M 8	8.000	1.25	15	595	744	12	475	594	10	400	500	
	M 10	10.000	1.50	15	475	713	12	380	570	10	320	480	
	M 1	1.000	0.25	4	1275	319	3	955	239	2	635	159	
	M 1.2	1.200	0.25	4	1060	265	3	795	199	2	530	133	
	M 1.4	1.400	0.30	4	910	273	3	680	204	2	455	137	
	M 1.6	1.600	0.35	4	795	278	3	595	208	2	400	140	
	M 1.8	1.800	0.35	4	705	247	3	530	186	2	355	124	
	M 2	2.000	0.40	4	635	254	3	475	190	2	320	128	
Stainless steel [Cr-Ni/1.4301] 	M 2.2	2.200	0.45	4	580	261	3	435	196	2	290	131	
	M 2.3	2.300	0.40	4	555	222	3	415	166	2	275	110	
	M 2.5	2.500	0.45	4	510	230	3	380	171	2	255	115	
	M 2.6	2.600	0.45	5	610	275	4	490	221	3	365	164	
	M 3	3.000	0.50	5	530	265	4	425	213	3	320	160	
	M 3.5	3.500	0.60	5	455	273	4	365	219	3	275	165	
	M 4	4.000	0.70	5	400	280	4	320	224	3	240	168	
	M 4.5	4.500	0.75	5	355	266	4	285	214	3	210	158	
	M 5	5.000	0.80	5	320	256	4	255	204	3	190	152	
	M 6	6.000	1.00	5	265	265	4	210	210	3	160	160	
Stainless steel [Cr-Ni/1.4301] 	M 8	8.000	1.25	5	200	250	4	160	200	3	120	150	
	M 10	10.000	1.50	5	160	240	4	125	188	3	95	143	

Taps u-tap

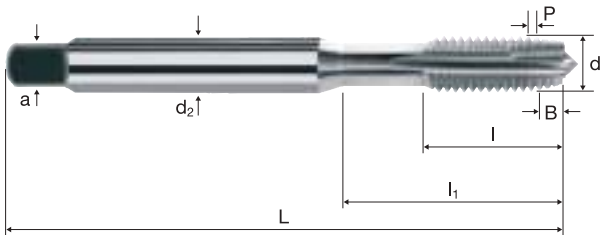


M

ISO 2
(6H)

HSS-E
Co5

Form B



Rm
<850
HRC
<24

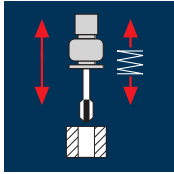
Inox
Stainless

GG(G)
Aluminium
Copper

M
MF
G
UN
EG

Example: Order-N°.											E10800	
Article-N°.												
ø-Code												
Ø Code	d	P	L	I	I ₁	d ₂	a					
010	M 1	0.25	40	5.50	-	2.5	2.1	2	0.80*	●		
012	M 1.2	0.25	40	5.50	-	2.5	2.1	2	1.00	●		
020	M 1.4	0.30	40	7.00	-	2.5	2.1	2	1.15*	●		
022	M 1.6	0.35	40	8.00	-	2.5	2.1	2	1.30	●		
024	M 1.7	0.35	40	8.00	-	2.5	2.1	2	1.40	●		
026	M 1.8	0.35	40	8.00	-	2.5	2.1	2	1.50	●		
034	M 2	0.40	45	8.00	-	2.8	2.1	2	1.60	●		
036	M 2.2	0.45	45	9.00	-	2.8	2.1	2	1.75	●		
038	M 2.3	0.40	45	9.00	-	2.8	2.1	2	1.90	●		
040	M 2.5	0.45	50	9.00	-	2.8	2.1	2	2.05	●		
042	M 2.6	0.45	50	9.00	-	2.8	2.1	2	2.15	●		
044	M 3	0.50	56	12.00	18.0	3.5	2.7	3	2.50	●		
056	M 3.5	0.60	56	12.00	20.0	4.0	3.0	3	2.90	●		
058	M 4	0.70	63	13.00	21.0	4.5	3.4	3	3.30	●		
061	M 4.5	0.75	70	14.00	25.0	6.0	4.9	3	3.75	●		
084	M 5	0.80	70	15.00	25.0	6.0	4.9	3	4.20	●		
088	M 6	1.00	80	17.00	30.0	6.0	4.9	3	5.00	●		
089	M 7	1.00	80	17.00	30.0	7.0	6.2	3	6.00	●		
160	M 8	1.25	90	20.00	35.0	8.0	6.2	3	6.80	●		
174	M 10	1.50	100	22.00	39.0	10.0	8.0	3	8.50	●		
≤ M 1.4 Tolerance ISO 1 (4H)												
* The given dimension core hole drill size is out of norm												

Application



Material

Steel
< 500 N/mm²



Steel
500 - 850 N/mm²



Wrought aluminium
alloys
Si < 6%
hardened

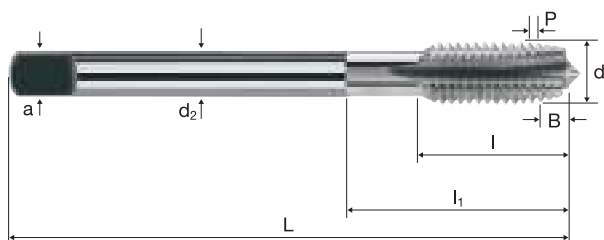


Stainless steel
[Cr-Ni/1.4301]



M	d [mm]	P [mm]	v_c 1.5 x d			v_c 2.0 x d			v_c 3.0 x d		
			n [min ⁻¹]	n [min ⁻¹]	v_f [100%]	n [min ⁻¹]	n [min ⁻¹]	v_f [100%]	n [min ⁻¹]	n [min ⁻¹]	v_f [100%]
M 12	12.000	1.75	18	475	831	15	400	700	12	320	560
M 14	14.000	2.00	18	410	820	15	340	680	12	275	550
M 16	16.000	2.00	18	360	720	15	300	600	12	240	480
M 18	18.000	2.50	18	320	800	15	265	663	12	210	525
M 20	20.000	2.50	18	285	713	15	240	600	12	190	475
M 22	22.000	2.50	18	260	650	15	215	538	12	175	438
M 24	24.000	3.00	18	240	720	15	200	600	12	160	480
M 12	12.000	1.75	15	400	700	10	265	464	8	210	368
M 14	14.000	2.00	15	340	680	10	225	450	8	180	360
M 16	16.000	2.00	15	300	600	10	200	400	8	160	320
M 18	18.000	2.50	15	265	663	10	175	438	8	140	350
M 20	20.000	2.50	15	240	600	10	160	400	8	125	313
M 22	22.000	2.50	15	215	538	10	145	363	8	115	288
M 24	24.000	3.00	15	200	600	10	135	405	8	105	315
M 12	12.000	1.75	15	400	700	12	320	560	10	265	464
M 14	14.000	2.00	15	340	680	12	275	550	10	225	450
M 16	16.000	2.00	15	300	600	12	240	480	10	200	400
M 18	18.000	2.50	15	265	663	12	210	525	10	175	438
M 20	20.000	2.50	15	240	600	12	190	475	10	160	400
M 22	22.000	2.50	15	215	538	12	175	438	10	145	363
M 24	24.000	3.00	15	200	600	12	160	480	10	135	405
M 12	12.000	1.75	5	135	236	4	105	184	3	80	140
M 14	14.000	2.00	5	115	230	4	90	180	3	70	140
M 16	16.000	2.00	5	100	200	4	80	160	3	60	120
M 18	18.000	2.50	5	90	225	4	70	175	3	55	138
M 20	20.000	2.50	5	80	200	4	65	163	3	50	125
M 22	22.000	2.50	5	70	175	4	60	150	3	45	113
M 24	24.000	3.00	5	65	195	4	55	165	3	40	120

ISO 2
(6H)

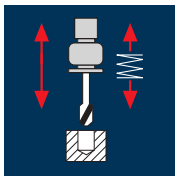
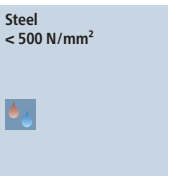
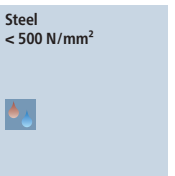
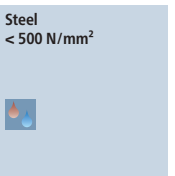
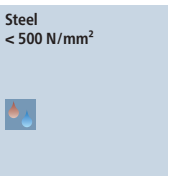
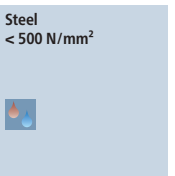
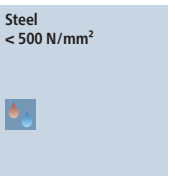
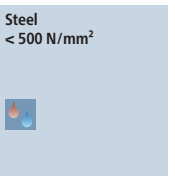


Inox Stainless

GG(G)
Aluminium
Copper

M
MF
G
UN
EG

[illegible]

Application	Material	M	d [mm]	P [mm]	v_c 1.0 x d	n [min ⁻¹]	v_f [100%]	v_c 1.5 x d	n [min ⁻¹]	v_f [100%]	v_c 2.0 x d	n [min ⁻¹]	v_f [100%]
	Steel < 500 N/mm ²	M 1.6	1.600	0.35	11	2190	767	10	1990	697	8	1590	557
		M 1.7	1.700	0.35	11	2060	721	10	1870	655	8	1500	525
		M 1.8	1.800	0.35	11	1945	681	10	1770	620	8	1415	495
		M 2	2.000	0.40	11	1750	700	10	1590	636	8	1275	510
		M 2.2	2.200	0.45	11	1590	716	10	1445	650	8	1155	520
		M 2.3	2.300	0.40	11	1520	608	10	1385	554	8	1105	442
		M 2.5	2.500	0.45	11	1400	630	10	1275	574	8	1020	459
		M 2.6	2.600	0.45	14	1715	772	12	1470	662	10	1225	551
		M 3	3.000	0.50	14	1485	743	12	1275	638	10	1060	530
		M 3.5	3.500	0.60	14	1275	765	12	1090	654	10	910	546
	Steel < 500 N/mm ²	M 4	4.000	0.70	14	1115	781	12	955	669	10	795	557
		M 4.5	4.500	0.75	14	990	743	12	850	638	10	705	529
		M 5	5.000	0.80	14	890	712	12	765	612	10	635	508
		M 6	6.000	1.00	14	745	745	12	635	635	10	530	530
		M 7	7.000	1.00	14	635	635	12	545	545	10	455	455
		M 8	8.000	1.25	14	555	694	12	475	594	10	400	500
		M 10	10.000	1.50	14	445	668	12	380	570	10	320	480
		M 1.6	1.600	0.35	8	1590	557	7	1395	488	6	1195	418
		M 1.7	1.700	0.35	8	1500	525	7	1310	459	6	1125	394
		M 1.8	1.800	0.35	8	1415	495	7	1240	434	6	1060	371
	Steel 500 - 850 N/mm ²	M 2	2.000	0.40	8	1275	510	7	1115	446	6	955	382
		M 2.2	2.200	0.45	8	1155	520	7	1015	457	6	870	392
		M 2.3	2.300	0.40	8	1105	442	7	970	388	6	830	332
		M 2.5	2.500	0.45	8	1020	459	7	890	401	6	765	344
		M 2.6	2.600	0.45	9	1100	495	8	980	441	7	855	385
		M 3	3.000	0.50	9	955	478	8	850	425	7	745	373
		M 3.5	3.500	0.60	9	820	492	8	730	438	7	635	381
		M 4	4.000	0.70	9	715	501	8	635	445	7	555	389
		M 4.5	4.500	0.75	9	635	476	8	565	424	7	495	371
		M 5	5.000	0.80	9	575	460	8	510	408	7	445	356
	Steel 500 - 850 N/mm ²	M 6	6.000	1.00	9	475	475	8	425	425	7	370	370
		M 7	7.000	1.00	9	410	410	8	365	365	7	320	320
		M 8	8.000	1.25	9	360	450	8	320	400	7	280	350
		M 10	10.000	1.50	9	285	428	8	255	383	7	225	338
		M 1.6	1.600	0.35	8	1590	557	6	1195	418	5	995	348
		M 1.7	1.700	0.35	8	1500	525	6	1125	394	5	935	327
		M 1.8	1.800	0.35	8	1415	495	6	1060	371	5	885	310
		M 2	2.000	0.40	8	1275	510	6	955	382	5	795	318
		M 2.2	2.200	0.45	8	1155	520	6	870	392	5	725	326
		M 2.3	2.300	0.40	8	1105	442	6	830	332	5	690	276
	Wrought aluminium alloys Si < 6% hardened	M 2.5	2.500	0.45	8	1020	459	6	765	344	5	635	286
		M 2.6	2.600	0.45	10	1225	551	8	980	441	6	735	331
		M 3	3.000	0.50	10	1060	530	8	850	425	6	635	318
		M 3.5	3.500	0.60	10	910	546	8	730	438	6	545	327
		M 4	4.000	0.70	10	795	557	8	635	445	6	475	333
		M 4.5	4.500	0.75	10	705	529	8	565	424	6	425	319
		M 5	5.000	0.80	10	635	508	8	510	408	6	380	304
		M 6	6.000	1.00	10	530	530	8	425	425	6	320	320
		M 7	7.000	1.00	10	455	455	8	365	365	6	275	275
		M 8	8.000	1.25	10	400	500	8	320	400	6	240	300
	Wrought aluminium alloys Si < 6% hardened	M 10	10.000	1.50	10	320	480	8	255	383	6	190	285
		M 1.6	1.600	0.35	3	595	208	2	400	140	2	400	140
		M 1.7	1.700	0.35	3	560	196	2	375	131	2	375	131
		M 1.8	1.800	0.35	3	530	186	2	355	124	2	355	124
		M 2	2.000	0.40	3	475	190	2	320	128	2	320	128
		M 2.2	2.200	0.45	3	435	196	2	290	131	2	290	131
		M 2.3	2.300	0.40	3	415	166	2	275	110	2	275	110
		M 2.5	2.500	0.45	3	380	171	2	255	115	2	255	115
		M 2.6	2.600	0.45	4	490	221	3	365	164	3	365	164
		M 3	3.000	0.50	4	425	213	3	320	160	3	320	160
	Stainless steel [Cr-Ni/1.4301]	M 3.5	3.500	0.60	4	365	219	3	275	165	3	275	165
		M 4	4.000	0.70	4	320	224	3	240	168	3	240	168
		M 4.5	4.500	0.75	4	285	214	3	210	158	3	210	158
		M 5	5.000	0.80	4	255	204	3	190	152	3	190	152
		M 6	6.000	1.00	4	210	210	3	160	160	3	160	160
		M 7	7.000	1.00	4	180	180	3	135	135	3	135	135
		M 8	8.000	1.25	4	160	200	3	120	150	3	120	150
		M 10	10.000	1.50	4	125	188	3	95	143	3	95	143
		M 3.5	3.500	0.60	4	365	219	3	275	165	3	275	165
		M 4	4.000	0.70	4	320	224	3	240	168	3	240	168
	Stainless steel [Cr-Ni/1.4301]	M 4.5	4.500	0.75	4	285	214	3	210	158	3	210	158
		M 5	5.000	0.80	4	255	204	3	190	152	3	190	152
		M 6	6.000	1.00	4	210	210	3	160	160	3	160	160
		M 7	7.000	1.00	4	180	180	3	135	135	3	135	135
		M 8	8.000	1.25	4	160	200	3	120	150	3	120	150
		M 10	10.000	1.50	4	125	188	3	95	143	3	95	143

Taps u-tap

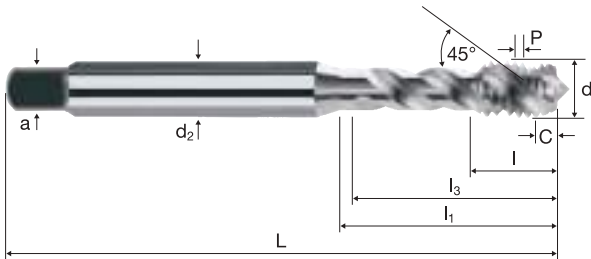


M

ISO 2
(6H)

HSS-E
Co5

Form C



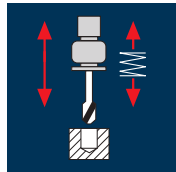
Rm
<850
HRC
<24

Inox
Stainless

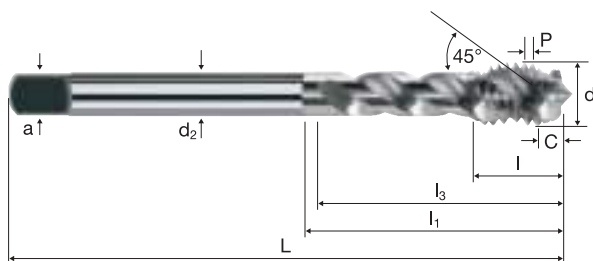
GG(G)
Aluminium
Copper

M
MF
G
UN
EG

Example: Order-N°. Article-N°. E10820 ø-Code 022											E10820	
Ø Code	d	P	L	I	I ₁	I ₃	d ₂	a				
022	M 1.6	0.35	40	8.00	-	9.0	2.5	2.1	3	1.30	●	
024	M 1.7	0.35	40	8.00	-	9.0	2.5	2.1	3	1.40	●	
026	M 1.8	0.35	40	8.00	-	9.0	2.5	2.1	3	1.50	●	
034	M 2	0.40	45	8.00	-	10.5	2.8	2.1	3	1.60	●	
036	M 2.2	0.45	45	9.00	-	12.5	2.8	2.1	3	1.75	●	
038	M 2.3	0.40	45	9.00	-	12.5	2.8	2.1	3	1.90	●	
040	M 2.5	0.45	50	9.00	-	13.0	2.8	2.1	3	2.05	●	
042	M 2.6	0.45	50	9.00	-	13.0	2.8	2.1	3	2.15	●	
044	M 3	0.50	56	4.00	18.0	16.0	3.5	2.7	3	2.50	●	
056	M 3.5	0.60	56	4.80	20.0	18.0	4.0	3.0	3	2.90	●	
058	M 4	0.70	63	5.60	21.0	19.0	4.5	3.4	3	3.30	●	
061	M 4.5	0.75	70	6.00	25.0	23.0	6.0	4.9	3	3.75	●	
084	M 5	0.80	70	6.40	25.0	23.0	6.0	4.9	3	4.20	●	
088	M 6	1.00	80	8.00	30.0	28.0	6.0	4.9	3	5.00	●	
089	M 7	1.00	80	8.00	30.0	28.0	7.0	6.2	3	6.00	●	
160	M 8	1.25	90	10.00	35.0	33.0	8.0	6.2	3	6.80	●	
174	M 10	1.50	100	12.00	39.0	37.0	10.0	8.0	3	8.50	●	

Application	Material	M	d [mm]	P [mm]	v_c 1.0 x d [min ⁻¹]	n [100%]	v_f [100%]	v_c 1.5 x d [min ⁻¹]	n [100%]	v_f [100%]	v_c 2.0 x d [min ⁻¹]	n [100%]	v_f [100%]	
	Steel < 500 N/mm ² 	M 12	12.000	1.75	14	370	648	12	320	560	10	265	464	
		M 14	14.000	2.00	14	320	640	12	275	550	10	225	450	
		M 16	16.000	2.00	14	280	560	12	240	480	10	200	400	
		M 18	18.000	2.50	14	250	625	12	210	525	10	175	438	
		M 20	20.000	2.50	14	225	563	12	190	475	10	160	400	
		M 22	22.000	2.50	14	205	513	12	175	438	10	145	363	
		M 24	24.000	3.00	14	185	555	12	160	480	10	135	405	
	Steel 500 - 850 N/mm ² 	M 12	12.000	1.75	9	240	420	8	210	368	7	185	324	
		M 14	14.000	2.00	9	205	410	8	180	360	7	160	320	
		M 16	16.000	2.00	9	180	360	8	160	320	7	140	280	
		M 18	18.000	2.50	9	160	400	8	140	350	7	125	313	
		M 20	20.000	2.50	9	145	363	8	125	313	7	110	275	
		M 22	22.000	2.50	9	130	325	8	115	288	7	100	250	
		M 24	24.000	3.00	9	120	360	8	105	315	7	95	285	
	Wrought aluminium alloys Si < 6% hardened 	M 12	12.000	1.75	10	265	464	8	210	368	6	160	280	
		M 14	14.000	2.00	10	225	450	8	180	360	6	135	270	
		M 16	16.000	2.00	10	200	400	8	160	320	6	120	240	
		M 18	18.000	2.50	10	175	438	8	140	350	6	105	263	
		M 20	20.000	2.50	10	160	400	8	125	313	6	95	238	
		M 22	22.000	2.50	10	145	363	8	115	288	6	85	213	
		M 24	24.000	3.00	10	135	405	8	105	315	6	80	240	
	Stainless steel [Cr-Ni/1.4301]  	M 12	12.000	1.75	4	105	184	3	80	140	3	80	140	
		M 14	14.000	2.00	4	90	180	3	70	140	3	70	140	
		M 16	16.000	2.00	4	80	160	3	60	120	3	60	120	
		M 18	18.000	2.50	4	70	175	3	55	138	3	55	138	
		M 20	20.000	2.50	4	65	163	3	50	125	3	50	125	
		M 22	22.000	2.50	4	60	150	3	45	113	3	45	113	
		M 24	24.000	3.00	4	55	165	3	40	120	3	40	120	

ISO 2
(6H)

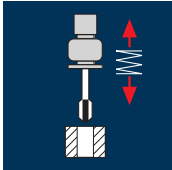


Inox Stainless

GG(G)
Aluminium
Copper

M
MF
G
UN
EG

[illegible]

Application	Material	M	d [mm]	P [mm]	v_c 1.5 x d	n [min ⁻¹]	v_f [100%]	v_c 2.0 x d	n [min ⁻¹]	v_f [100%]	v_c 3.0 x d	n [min ⁻¹]	v_f [100%]
	Steel < 500 N/mm ² 	M 3	3.000	0.50	8	850	425	6	635	318	4	425	213
		M 4	4.000	0.70	8	635	445	6	475	333	4	320	224
		M 5	5.000	0.80	8	510	408	6	380	304	4	255	204
		M 6	6.000	1.00	8	425	425	6	320	320	4	210	210
		M 8	8.000	1.25	8	320	400	6	240	300	4	160	200
		M 10	10.000	1.50	8	255	383	6	190	285	4	125	188
	Steel 500 - 850 N/mm ² 	M 3	3.000	0.50	5	530	265	4	425	213	3	320	160
		M 4	4.000	0.70	5	400	280	4	320	224	3	240	168
		M 5	5.000	0.80	5	320	256	4	255	204	3	190	152
		M 6	6.000	1.00	5	265	265	4	210	210	3	160	160
		M 8	8.000	1.25	5	200	250	4	160	200	3	120	150
		M 10	10.000	1.50	5	160	240	4	125	188	3	95	143
	Wrought aluminium alloys Si < 6% hardened 	M 3	3.000	0.50	8	850	425	6	635	318	4	425	213
		M 4	4.000	0.70	8	635	445	6	475	333	4	320	224
		M 5	5.000	0.80	8	510	408	6	380	304	4	255	204
		M 6	6.000	1.00	8	425	425	6	320	320	4	210	210
		M 8	8.000	1.25	8	320	400	6	240	300	4	160	200
		M 10	10.000	1.50	8	255	383	6	190	285	4	125	188
	Cast iron GG 	M 3	3.000	0.50	12	1275	638	10	1060	530	8	850	425
		M 4	4.000	0.70	12	955	669	10	795	557	8	635	445
		M 5	5.000	0.80	12	765	612	10	635	508	8	510	408
		M 6	6.000	1.00	12	635	635	10	530	530	8	425	425
		M 8	8.000	1.25	12	475	594	10	400	500	8	320	400
		M 10	10.000	1.50	12	380	570	10	320	480	8	255	383

Special long execution

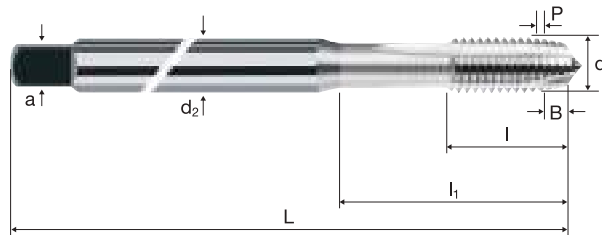


M

ISO 2
(6H)



HSS-E
Co5



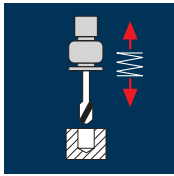
Rm
<850
HRC
<24

GG(G)
Aluminium

M
MF
G
UN
EG

[illegible]

Application



Material

Steel
< 500 N/mm²



Steel
500 - 850 N/mm²



Wrought aluminium
alloys
Si < 6%
hardened



Cast iron
GG



M	d [mm]	P [mm]	v_c 1.0 x d	n [min ⁻¹]	v_f [100%]	v_c 1.5 x d	n [min ⁻¹]	v_f [100%]	v_c 2.0 x d	n [min ⁻¹]	v_f [100%]
M 3	3.000	0.50	8	850	425	6	635	318	4	425	213
M 4	4.000	0.70	8	635	445	6	475	333	4	320	224
M 5	5.000	0.80	8	510	408	6	380	304	4	255	204
M 6	6.000	1.00	8	425	425	6	320	320	4	210	210
M 8	8.000	1.25	8	320	400	6	240	300	4	160	200
M 10	10.000	1.50	8	255	383	6	190	285	4	125	188
M 3	3.000	0.50	5	530	265	4	425	213	3	320	160
M 4	4.000	0.70	5	400	280	4	320	224	3	240	168
M 5	5.000	0.80	5	320	256	4	255	204	3	190	152
M 6	6.000	1.00	5	265	265	4	210	210	3	160	160
M 8	8.000	1.25	5	200	250	4	160	200	3	120	150
M 10	10.000	1.50	5	160	240	4	125	188	3	95	143
M 3	3.000	0.50	8	850	425	6	635	318	4	425	213
M 4	4.000	0.70	8	635	445	6	475	333	4	320	224
M 5	5.000	0.80	8	510	408	6	380	304	4	255	204
M 6	6.000	1.00	8	425	425	6	320	320	4	210	210
M 8	8.000	1.25	8	320	400	6	240	300	4	160	200
M 10	10.000	1.50	8	255	383	6	190	285	4	125	188
M 3	3.000	0.50	12	1275	638	10	1060	530	8	850	425
M 4	4.000	0.70	12	955	669	10	795	557	8	635	445
M 5	5.000	0.80	12	765	612	10	635	508	8	510	408
M 6	6.000	1.00	12	635	635	10	530	530	8	425	425
M 8	8.000	1.25	12	475	594	10	400	500	8	320	400
M 10	10.000	1.50	12	380	570	10	320	480	8	255	383

Taps

Special long execution

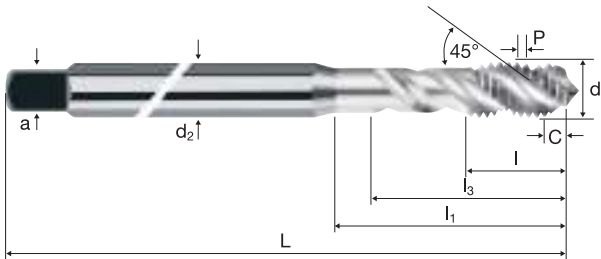


M

ISO 2
(6H)

HSS-E
Co5

Form C



Rm <850 HRC <24											GG(G) Aluminium
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Example: Order-N°. Article-N°. E10355 ø-Code 044												E10355	
Ø Code	d	P	L	l	l ₁	l ₃	d ₂	a					
044	M 3	0.50	90	6.00	18.0	14.0	3.5	2.7	3	2.50	●		
058	M 4	0.70	125	7.50	21.0	17.0	4.5	3.4	3	3.30	●		
084	M 5	0.80	140	8.50	25.0	21.0	6.0	4.9	3	4.20	●		
088	M 6	1.00	160	11.00	30.0	26.0	6.0	4.9	3	5.00	●		
160	M 8	1.25	180	14.00	35.0	31.0	8.0	6.2	3	6.80	●		
174	M 10	1.50	200	16.00	39.0	35.0	10.0	8.0	3	8.50	●		

Steel
< 500 N/mm²

256

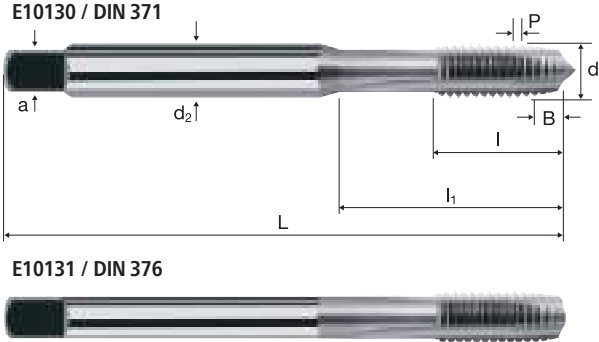


M-LH

ISO 2
(6H)

HSS-E
Co5

X - P
Form B



Rm
<850
HRC
<24

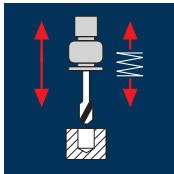
Inox
Stainless

GG(G)
Aluminium
Copper

M
MF
G
UN
EG

Example: Order-N°.											Article-N°.		a-Code			
											E10130		034			
Ø Code	d	P		L	l	l ₁	d ₂	a			E10130					
034	M 2	0.40	LH	45	8.00	13.5	2.8	2.1	3	1.60	●					
040	M 2.5	0.45	LH	50	9.00	14.5	2.8	2.1	3	2.05	●					
044	M 3	0.50	LH	56	10.00	18.0	3.5	2.7	3	2.50	●					
058	M 4	0.70	LH	63	12.00	21.0	4.5	3.4	3	3.30	●					
084	M 5	0.80	LH	70	14.00	25.0	6.0	4.9	3	4.20	●					
088	M 6	1.00	LH	80	16.00	30.0	6.0	4.9	3	5.00	●					
160	M 8	1.25	LH	90	17.00	35.0	8.0	6.2	3	6.80	●					
174	M 10	1.50	LH	100	20.00	39.0	10.0	8.0	3	8.50	●					

Example: Order-N°.											Article-N°.		a-Code			
											E10131		240			
Ø Code	d	P		L	l	l ₁	d ₂	a			E10131					
240	M 12	1.75	LH	110	24.00	49.0	9.0	7.0	4	10.20	●					
246	M 16	2.00	LH	110	26.00	54.0	12.0	9.0	4	14.00	●					
314	M 20	2.50	LH	140	32.00	62.0	16.0	12.0	4	17.50	●					
320	M 24	3.00	LH	160	36.00	73.0	18.0	14.5	4	21.00	●					

Application	Material	M-LH	d [mm]	P [mm]	v_c 1.0 x d	n [min ⁻¹]	v_f [100%]	v_c 1.5 x d	n [min ⁻¹]	v_f [100%]	v_c 2.0 x d	n [min ⁻¹]	v_f [100%]
	Steel < 500 N/mm ²	M 2	2.000	0.40	11	1750	700	10	1590	636	8	1275	510
		M 2.5	2.500	0.45	11	1400	630	10	1275	574	8	1020	459
		M 3	3.000	0.50	14	1485	743	12	1275	638	10	1060	530
		M 4	4.000	0.70	14	1115	781	12	955	669	10	795	557
		M 5	5.000	0.80	14	890	712	12	765	612	10	635	508
		M 6	6.000	1.00	14	745	745	12	635	635	10	530	530
		M 8	8.000	1.25	14	555	694	12	475	594	10	400	500
		M 10	10.000	1.50	14	445	668	12	380	570	10	320	480
		M 12	12.000	1.75	14	370	648	12	320	560	10	265	464
		M 16	16.000	2.00	14	280	560	12	240	480	10	200	400
	Steel < 500 N/mm ²	M 20	20.000	2.50	14	225	563	12	190	475	10	160	400
		M 24	24.000	3.00	14	185	555	12	160	480	10	135	405
	Steel 500 - 850 N/mm ²	M 2	2.000	0.40	7	1115	446	6	955	382	5	795	318
		M 2.5	2.500	0.45	7	890	401	6	765	344	5	635	286
		M 3	3.000	0.50	9	955	478	8	850	425	7	745	373
		M 4	4.000	0.70	9	715	501	8	635	445	7	555	389
		M 5	5.000	0.80	9	575	460	8	510	408	7	445	356
		M 6	6.000	1.00	9	475	475	8	425	425	7	370	370
		M 8	8.000	1.25	9	360	450	8	320	400	7	280	350
		M 10	10.000	1.50	9	285	428	8	255	383	7	225	338
		M 12	12.000	1.75	9	240	420	8	210	368	7	185	324
		M 16	16.000	2.00	9	180	360	8	160	320	7	140	280
	Steel 500 - 850 N/mm ²	M 20	20.000	2.50	9	145	363	8	125	313	7	110	275
		M 24	24.000	3.00	9	120	360	8	105	315	7	95	285
	Wrought aluminium alloys Si < 6% hardened	M 2	2.000	0.40	8	1275	510	6	955	382	5	795	318
		M 2.5	2.500	0.45	8	1020	459	6	765	344	5	635	286
		M 3	3.000	0.50	10	1060	530	8	850	425	6	635	318
		M 4	4.000	0.70	10	795	557	8	635	445	6	475	333
		M 5	5.000	0.80	10	635	508	8	510	408	6	380	304
		M 6	6.000	1.00	10	530	530	8	425	425	6	320	320
		M 8	8.000	1.25	10	400	500	8	320	400	6	240	300
		M 10	10.000	1.50	10	320	480	8	255	383	6	190	285
		M 12	12.000	1.75	10	265	464	8	210	368	6	160	280
		M 16	16.000	2.00	10	200	400	8	160	320	6	120	240
	Wrought aluminium alloys Si < 6% hardened	M 20	20.000	2.50	10	160	400	8	125	313	6	95	238
		M 24	24.000	3.00	10	135	405	8	105	315	6	80	240
 	Stainless steel [Cr-Ni/1.4301]	M 2	2.000	0.40	3	475	190	2	320	128	2	320	128
		M 2.5	2.500	0.45	3	380	171	2	255	115	2	255	115
		M 3	3.000	0.50	4	425	213	3	320	160	3	320	160
		M 4	4.000	0.70	4	320	224	3	240	168	3	240	168
		M 5	5.000	0.80	4	255	204	3	190	152	3	190	152
		M 6	6.000	1.00	4	210	210	3	160	160	3	160	160
		M 8	8.000	1.25	4	160	200	3	120	150	3	120	150
		M 10	10.000	1.50	4	125	188	3	95	143	3	95	143
		M 12	12.000	1.75	4	105	184	3	80	140	3	80	140
		M 16	16.000	2.00	4	80	160	3	60	120	3	60	120
 	Stainless steel [Cr-Ni/1.4301]	M 20	20.000	2.50	4	65	163	3	50	125	3	50	125
		M 24	24.000	3.00	4	55	165	3	40	120	3	40	120

Taps

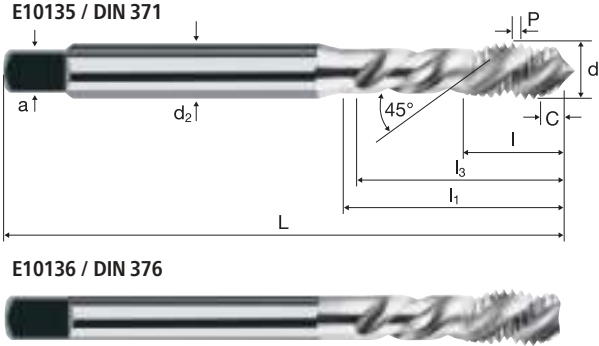


M-LH

ISO 2
(6H)

HSS-E
Co5

X - P
Form C



Rm
<850
HRC
<24

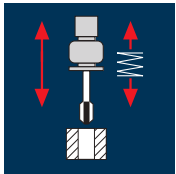
Inox
Stainless

GG(G)
Aluminium
Copper

M
MF
G
UN
EG

Example: Order-N°.												Article-N°.		α-Code			
												E10135		034		E10135	
Ø Code	d	P		L	l	l ₁	l ₃	d ₂	a								
034	M 2	0.40	LH	45	4.50	13.5	11.5	2.8	2.1	3	1.60	●					
040	M 2.5	0.45	LH	50	5.00	14.5	12.5	2.8	2.1	3	2.05	●					
044	M 3	0.50	LH	56	6.00	18.0	14.0	3.5	2.7	3	2.50	●					
058	M 4	0.70	LH	63	7.50	21.0	17.0	4.5	3.4	3	3.30	●					
084	M 5	0.80	LH	70	8.50	25.0	21.0	6.0	4.9	3	4.20	●					
088	M 6	1.00	LH	80	11.00	30.0	26.0	6.0	4.9	3	5.00	●					
160	M 8	1.25	LH	90	14.00	35.0	31.0	8.0	6.2	3	6.80	●					
174	M 10	1.50	LH	100	16.00	39.0	35.0	10.0	8.0	3	8.50	●					

Example: Order-N°.												Article-N°.		α-Code			
												E10136		240		E10136	
Ø Code	d	P		L	l	l ₁	l ₃	d ₂	a								
240	M 12	1.75	LH	110	18.50	49.0	45.0	9.0	7.0	3	10.20	●					
246	M 16	2.00	LH	110	20.00	54.0	50.0	12.0	9.0	4	14.00	●					
314	M 20	2.50	LH	140	25.00	62.0	58.0	16.0	12.0	4	17.50	●					
320	M 24	3.00	LH	160	30.00	73.0	69.0	18.0	14.5	4	21.00	●					

Application	Material	M	d [mm]	P [mm]	v_c 1.5 x d	n [min ⁻¹]	v_f [100%]	v_c 2.0 x d	n [min ⁻¹]	v_f [100%]	v_c 3.0 x d	n [min ⁻¹]	v_f [100%]
	Steel < 500 N/mm ²	M 2	2.000	0.40	14	2230	892	12	1910	764	10	1590	636
		M 2.5	2.500	0.45	14	1785	803	12	1530	689	10	1275	574
		M 3	3.000	0.50	18	1910	955	15	1590	795	12	1275	638
		M 4	4.000	0.70	18	1430	1001	15	1195	837	12	955	669
		M 5	5.000	0.80	18	1145	916	15	955	764	12	765	612
		M 6	6.000	1.00	18	955	955	15	795	795	12	635	635
		M 8	8.000	1.25	18	715	894	15	595	744	12	475	594
		M 10	10.000	1.50	18	575	863	15	475	713	12	380	570
		M 12	12.000	1.75	18	475	831	15	400	700	12	320	560
		M 16	16.000	2.00	18	360	720	15	300	600	12	240	480
	Steel < 500 N/mm ²	M 20	20.000	2.50	18	285	713	15	240	600	12	190	475
		M 24	24.000	3.00	18	240	720	15	200	600	12	160	480
	Steel 500 - 850 N/mm ²	M 2	2.000	0.40	12	1910	764	8	1275	510	6	955	382
		M 2.5	2.500	0.45	12	1530	689	8	1020	459	6	765	344
		M 3	3.000	0.50	15	1590	795	10	1060	530	8	850	425
		M 4	4.000	0.70	15	1195	837	10	795	557	8	635	445
		M 5	5.000	0.80	15	955	764	10	635	508	8	510	408
		M 6	6.000	1.00	15	795	795	10	530	530	8	425	425
		M 8	8.000	1.25	15	595	744	10	400	500	8	320	400
		M 10	10.000	1.50	15	475	713	10	320	480	8	255	383
		M 12	12.000	1.75	15	400	700	10	265	464	8	210	368
		M 16	16.000	2.00	15	300	600	10	200	400	8	160	320
	Steel 500 - 850 N/mm ²	M 20	20.000	2.50	15	240	600	10	160	400	8	125	313
		M 24	24.000	3.00	15	200	600	10	135	405	8	105	315
	Wrought aluminium alloys Si < 6% hardened	M 2	2.000	0.40	12	1910	764	10	1590	636	8	1275	510
		M 2.5	2.500	0.45	12	1530	689	10	1275	574	8	1020	459
		M 3	3.000	0.50	15	1590	795	12	1275	638	10	1060	530
		M 4	4.000	0.70	15	1195	837	12	955	669	10	795	557
		M 5	5.000	0.80	15	955	764	12	765	612	10	635	508
		M 6	6.000	1.00	15	795	795	12	635	635	10	530	530
		M 8	8.000	1.25	15	595	744	12	475	594	10	400	500
		M 10	10.000	1.50	15	475	713	12	380	570	10	320	480
		M 12	12.000	1.75	15	400	700	12	320	560	10	265	464
		M 16	16.000	2.00	15	300	600	12	240	480	10	200	400
	Wrought aluminium alloys Si < 6% hardened	M 20	20.000	2.50	15	240	600	12	190	475	10	160	400
		M 24	24.000	3.00	15	200	600	12	160	480	10	135	405
 	Stainless steel [Cr-Ni/1.4301]	M 2	2.000	0.40	4	635	254	3	475	190	2	320	128
		M 2.5	2.500	0.45	4	510	230	3	380	171	2	255	115
		M 3	3.000	0.50	5	530	265	4	425	213	3	320	160
		M 4	4.000	0.70	5	400	280	4	320	224	3	240	168
		M 5	5.000	0.80	5	320	256	4	255	204	3	190	152
		M 6	6.000	1.00	5	265	265	4	210	210	3	160	160
		M 8	8.000	1.25	5	200	250	4	160	200	3	120	150
		M 10	10.000	1.50	5	160	240	4	125	188	3	95	143
		M 12	12.000	1.75	5	135	236	4	105	184	3	80	140
		M 16	16.000	2.00	5	100	200	4	80	160	3	60	120
 	Stainless steel [Cr-Ni/1.4301]	M 20	20.000	2.50	5	80	200	4	65	163	3	50	125
		M 24	24.000	3.00	5	65	195	4	55	165	3	40	120

Taps

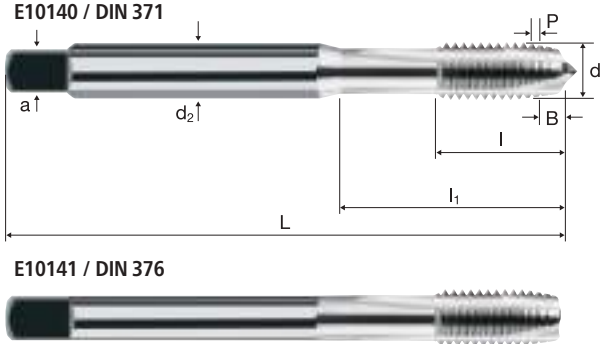


M

ISO 2
+0,1

HSS-E
Co5

X - P
Form B



Rm
<850
HRC
<24

Inox
Stainless

GG(G)
Aluminium
Copper

M

MF

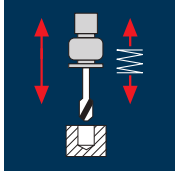
G

UN

EG

Example: Order-Nº. Article-Nº. E10140 α-Code 034										E10140	
Ø Code	d	P	L	l	l ₁	d ₂	a		Δ		
034	M 2	0.40	45	8.00	13.5	2.8	2.1	3	+0.100	●	
040	M 2.5	0.45	50	9.00	14.5	2.8	2.1	3	+0.100	●	
044	M 3	0.50	56	10.00	18.0	3.5	2.7	3	+0.100	●	
058	M 4	0.70	63	12.00	21.0	4.5	3.4	3	+0.100	●	
084	M 5	0.80	70	14.00	25.0	6.0	4.9	3	+0.100	●	
088	M 6	1.00	80	16.00	30.0	6.0	4.9	3	+0.100	●	
160	M 8	1.25	90	17.00	35.0	8.0	6.2	3	+0.100	●	
174	M 10	1.50	100	20.00	39.0	10.0	8.0	3	+0.100	●	

Example: Order-Nº. Article-Nº. E10141 α-Code 240										E10141	
Ø Code	d	P	L	l	l ₁	d ₂	a		Δ		
240	M 12	1.75	110	24.00	49.0	9.0	7.0	4	+0.100	●	
246	M 16	2.00	110	26.00	54.0	12.0	9.0	4	+0.100	●	
314	M 20	2.50	140	32.00	62.0	16.0	12.0	4	+0.100	●	
320	M 24	3.00	160	36.00	73.0	18.0	14.5	4	+0.100	●	

Application	Material	M	d [mm]	P [mm]	v_c 1.0 x d	n [min ⁻¹]	v_f [100%]	v_c 1.5 x d	n [min ⁻¹]	v_f [100%]	v_c 2.0 x d	n [min ⁻¹]	v_f [100%]
	Steel < 500 N/mm ²	M 2	2.000	0.40	12	1910	764	10	1590	636	8	1275	510
		M 2.5	2.500	0.45	12	1530	689	10	1275	574	8	1020	459
		M 3	3.000	0.50	14	1485	743	12	1275	638	10	1060	530
		M 4	4.000	0.70	14	1115	781	12	955	669	10	795	557
		M 5	5.000	0.80	14	890	712	12	765	612	10	635	508
		M 6	6.000	1.00	14	745	745	12	635	635	10	530	530
		M 8	8.000	1.25	14	555	694	12	475	594	10	400	500
		M 10	10.000	1.50	14	445	668	12	380	570	10	320	480
		M 12	12.000	1.75	14	370	648	12	320	560	10	265	464
		M 16	16.000	2.00	14	280	560	12	240	480	10	200	400
	Steel < 500 N/mm ²	M 20	20.000	2.50	14	225	563	12	190	475	10	160	400
		M 24	24.000	3.00	14	185	555	12	160	480	10	135	405
	Steel 500 - 850 N/mm ²	M 2	2.000	0.40	7	1115	446	6	955	382	5	795	318
		M 2.5	2.500	0.45	7	890	401	6	765	344	5	635	286
		M 3	3.000	0.50	9	955	478	8	850	425	7	745	373
		M 4	4.000	0.70	9	715	501	8	635	445	7	555	389
		M 5	5.000	0.80	9	575	460	8	510	408	7	445	356
		M 6	6.000	1.00	9	475	475	8	425	425	7	370	370
		M 8	8.000	1.25	9	360	450	8	320	400	7	280	350
		M 10	10.000	1.50	9	285	428	8	255	383	7	225	338
		M 12	12.000	1.75	9	240	420	8	210	368	7	185	324
		M 16	16.000	2.00	9	180	360	8	160	320	7	140	280
	Steel 500 - 850 N/mm ²	M 20	20.000	2.50	9	145	363	8	125	313	7	110	275
		M 24	24.000	3.00	9	120	360	8	105	315	7	95	285
	Wrought aluminium alloys Si < 6% hardened	M 2	2.000	0.40	8	1275	510	6	955	382	5	795	318
		M 2.5	2.500	0.45	8	1020	459	6	765	344	5	635	286
		M 3	3.000	0.50	10	1060	530	8	850	425	6	635	318
		M 4	4.000	0.70	10	795	557	8	635	445	6	475	333
		M 5	5.000	0.80	10	635	508	8	510	408	6	380	304
		M 6	6.000	1.00	10	530	530	8	425	425	6	320	320
		M 8	8.000	1.25	10	400	500	8	320	400	6	240	300
		M 10	10.000	1.50	10	320	480	8	255	383	6	190	285
		M 12	12.000	1.75	10	265	464	8	210	368	6	160	280
		M 16	16.000	2.00	10	200	400	8	160	320	6	120	240
	Wrought aluminium alloys Si < 6% hardened	M 20	20.000	2.50	10	160	400	8	125	313	6	95	238
		M 24	24.000	3.00	10	135	405	8	105	315	6	80	240
 	Stainless steel [Cr-Ni/1.4301]	M 2	2.000	0.40	3	475	190	2	320	128	2	320	128
		M 2.5	2.500	0.45	3	380	171	2	255	115	2	255	115
		M 3	3.000	0.50	4	425	213	3	320	160	3	320	160
		M 4	4.000	0.70	4	320	224	3	240	168	3	240	168
		M 5	5.000	0.80	4	255	204	3	190	152	3	190	152
		M 6	6.000	1.00	4	210	210	3	160	160	3	160	160
		M 8	8.000	1.25	4	160	200	3	120	150	3	120	150
		M 10	10.000	1.50	4	125	188	3	95	143	3	95	143
		M 12	12.000	1.75	4	105	184	3	80	140	3	80	140
		M 16	16.000	2.00	4	80	160	3	60	120	3	60	120
 	Stainless steel [Cr-Ni/1.4301]	M 20	20.000	2.50	4	65	163	3	50	125	3	50	125
		M 24	24.000	3.00	4	55	165	3	40	120	3	40	120

Taps

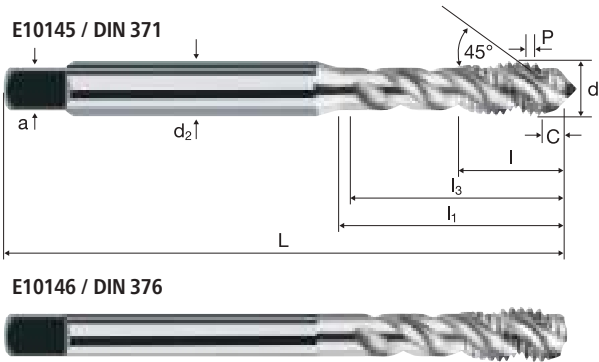


M

ISO 2
+0,1

HSS-E
Co5

X - P
Form C

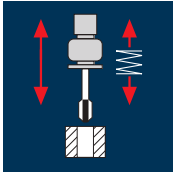


Rm <850 HRC <24								Inox Stainless		GG(G) Aluminium Copper
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Example: Order-Nº. E10145 Article-Nº. 034											E10145	
Ø Code	d	P	L	l	l ₁	l ₃	d ₂	a		Δ		
034	M 2	0.40	45	4.50	13.5	11.5	2.8	2.1	3	+0.100	●	
040	M 2.5	0.45	50	5.00	14.5	12.5	2.8	2.1	3	+0.100	●	
044	M 3	0.50	56	6.00	18.0	14.0	3.5	2.7	3	+0.100	●	
058	M 4	0.70	63	7.50	21.0	17.0	4.5	3.4	3	+0.100	●	
084	M 5	0.80	70	8.50	25.0	21.0	6.0	4.9	3	+0.100	●	
088	M 6	1.00	80	11.00	30.0	26.0	6.0	4.9	3	+0.100	●	
160	M 8	1.25	90	14.00	35.0	31.0	8.0	6.2	3	+0.100	●	
174	M 10	1.50	100	16.00	39.0	35.0	10.0	8.0	3	+0.100	●	

Example: Order-Nº. E10146 Article-Nº. 240											E10146	
Ø Code	d	P	L	l	l ₁	l ₃	d ₂	a		Δ		
240	M 12	1.75	110	18.50	49.0	45.0	9.0	7.0	3	+0.100	●	
246	M 16	2.00	110	20.00	54.0	50.0	12.0	9.0	4	+0.100	●	
314	M 20	2.50	140	25.00	62.0	58.0	16.0	12.0	4	+0.100	●	
320	M 24	3.00	160	30.00	73.0	69.0	18.0	14.5	4	+0.100	●	

Application



Material

Steel
500 - 850 N/mm²



Steel
500 - 850 N/mm²



Steel
850 - 1100 N/mm²



Steel
850 - 1100 N/mm²



Steel
1100 - 1300 N/mm²



Steel
1100 - 1300 N/mm²



M	d [mm]	P [mm]	v _c 1.5 x d			v _c 2.0 x d			v _c 3.0 x d		
			n [min ⁻¹]	n [min ⁻¹]	v _f [100%]	n [min ⁻¹]	n [min ⁻¹]	v _f [100%]	n [min ⁻¹]	n [min ⁻¹]	v _f [100%]
M 2	2.000	0.40	25	3980	1592	20	3185	1274	15	2385	954
M 2.5	2.500	0.45	25	3185	1433	20	2545	1145	15	1910	860
M 3	3.000	0.50	25	2655	1328	20	2120	1060	15	1590	795
M 4	4.000	0.70	25	1990	1393	20	1590	1113	15	1195	837
M 5	5.000	0.80	25	1590	1272	20	1275	1020	15	955	764
M 6	6.000	1.00	25	1325	1325	20	1060	1060	15	795	795
M 8	8.000	1.25	25	995	1244	20	795	994	15	595	744
M 10	10.000	1.50	25	795	1193	20	635	953	15	475	713
M 12	12.000	1.75	25	665	1164	20	530	928	15	400	700
M 16	16.000	2.00	25	495	990	20	400	800	15	300	600
M 20	20.000	2.50	25	400	1000	20	320	800	15	240	600
M 24	24.000	3.00	25	330	990	20	265	795	15	200	600
M 2	2.000	0.40	20	3185	1274	15	2385	954	12	1910	764
M 2.5	2.500	0.45	20	2545	1145	15	1910	860	12	1530	689
M 3	3.000	0.50	20	2120	1060	15	1590	795	12	1275	638
M 4	4.000	0.70	20	1590	1113	15	1195	837	12	955	669
M 5	5.000	0.80	20	1275	1020	15	955	764	12	765	612
M 6	6.000	1.00	20	1060	1060	15	795	795	12	635	635
M 8	8.000	1.25	20	795	994	15	595	744	12	475	594
M 10	10.000	1.50	20	635	953	15	475	713	12	380	570
M 12	12.000	1.75	20	530	928	15	400	700	12	320	560
M 16	16.000	2.00	20	400	800	15	300	600	12	240	480
M 20	20.000	2.50	20	320	800	15	240	600	12	190	475
M 24	24.000	3.00	20	265	795	15	200	600	12	160	480
M 2	2.000	0.40	7	1115	446	4	635	254	-	-	-
M 2.5	2.500	0.45	7	890	401	4	510	230	-	-	-
M 3	3.000	0.50	7	745	373	4	425	213	-	-	-
M 4	4.000	0.70	7	555	389	4	320	224	-	-	-
M 5	5.000	0.80	7	445	356	4	255	204	-	-	-
M 6	6.000	1.00	7	370	370	4	210	210	-	-	-
M 8	8.000	1.25	7	280	350	4	160	200	-	-	-
M 10	10.000	1.50	7	225	338	4	125	188	-	-	-
M 12	12.000	1.75	7	185	324	4	105	184	-	-	-
M 16	16.000	2.00	7	140	280	4	80	160	-	-	-
M 20	20.000	2.50	7	110	275	4	65	163	-	-	-
M 24	24.000	3.00	7	95	285	4	55	165	-	-	-

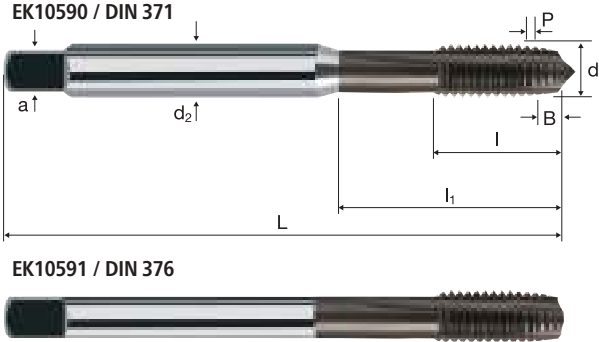
M

ISO 3
(6G)

HSS-E
Co5

DIN
371/376

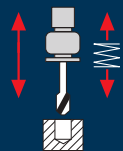
Form B



Rm <850 HRC < 24	Rm 850-1100 HRC 24- 34	Rm 1100-1300 HRC 34- 42							
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Example: Order-N°. EK10590 034										TiAlN
Article-N°. 034 α-Code										EK10590
Ø Code	d	P	L	l	l ₁	d ₂	a		Δ	
034	M 2	0.40	45	8.00	13.5	2.8	2.1	3	+0.015	●
040	M 2.5	0.45	50	9.00	14.5	2.8	2.1	3	+0.015	●
044	M 3	0.50	56	10.00	18.0	3.5	2.7	3	+0.016	●
058	M 4	0.70	63	12.00	21.0	4.5	3.4	3	+0.019	●
084	M 5	0.80	70	14.00	25.0	6.0	4.9	3	+0.020	●
088	M 6	1.00	80	16.00	30.0	6.0	4.9	3	+0.024	●
160	M 8	1.25	90	17.00	35.0	8.0	6.2	3	+0.025	●
174	M 10	1.50	100	20.00	39.0	10.0	8.0	3	+0.028	●

Example: Order-N°. EK10591 240										TiAlN
Article-N°. 240 α-Code										EK10591
Ø Code	d	P	L	l	l ₁	d ₂	a		Δ	
240	M 12	1.75	110	24.00	49.0	9.0	7.0	4	+0.032	●
246	M 16	2.00	110	26.00	54.0	12.0	9.0	4	+0.034	●
314	M 20	2.50	140	32.00	62.0	16.0	12.0	4	+0.036	●
320	M 24	3.00	160	36.00	73.0	18.0	14.5	4	+0.042	●

Application	Material												
	 Steel 500 - 850 N/mm ²	M	d [mm]	P [mm]	v_c 1.0 x d [min ⁻¹]	n [min ⁻¹]	v_f [100%]	v_c 1.5 x d [min ⁻¹]	n [min ⁻¹]	v_f [100%]	v_c 2.0 x d [min ⁻¹]	n [min ⁻¹]	v_f [100%]
		M 2	2.000	0.40	32	5095	2038	28	4455	1782	22	3500	1400
		M 2.5	2.500	0.45	32	4075	1834	28	3565	1604	22	2800	1260
		M 3	3.000	0.50	32	3395	1698	28	2970	1485	22	2335	1168
		M 4	4.000	0.70	32	2545	1782	28	2230	1561	22	1750	1225
		M 5	5.000	0.80	32	2035	1628	28	1785	1428	22	1400	1120
		M 6	6.000	1.00	32	1700	1700	28	1485	1485	22	1165	1165
		M 8	8.000	1.25	32	1275	1594	28	1115	1394	22	875	1094
		M 10	10.000	1.50	32	1020	1530	28	890	1335	22	700	1050
		M 12	12.000	1.75	32	850	1488	28	745	1304	22	585	1024
 Steel 500 - 850 N/mm ²	M 16 <td>16.000</td> <td>2.00</td> <td>32</td> <td>635</td> <td>1270</td> <td>28</td> <td>555</td> <td>1110</td> <td>22</td> <td>440</td> <td>880</td>	16.000	2.00	32	635	1270	28	555	1110	22	440	880	
	M 20	20.000	2.50	32	510	1275	28	445	1113	22	350	875	
	M 24	24.000	3.00	32	425	1275	28	370	1110	22	290	870	
 Steel 850 - 1100 N/mm ²	M 2	2.000	0.40	20	3185	1274	16	2545	1018	10	1590	636	
	M 2.5	2.500	0.45	20	2545	1145	16	2035	916	10	1275	574	
	M 3	3.000	0.50	20	2120	1060	16	1700	850	10	1060	530	
	M 4	4.000	0.70	20	1590	1113	16	1275	893	10	795	557	
	M 5	5.000	0.80	20	1275	1020	16	1020	816	10	635	508	
	M 6	6.000	1.00	20	1060	1060	16	850	850	10	530	530	
	M 8	8.000	1.25	20	795	994	16	635	794	10	400	500	
	M 10	10.000	1.50	20	635	953	16	510	765	10	320	480	
	M 12	12.000	1.75	20	530	928	16	425	744	10	265	464	
 Steel 850 - 1100 N/mm ²	M 16	16.000	2.00	20	400	800	16	320	640	10	200	400	
	M 20	20.000	2.50	20	320	800	16	255	638	10	160	400	
	M 24	24.000	3.00	20	265	795	16	210	630	10	135	405	

Taps

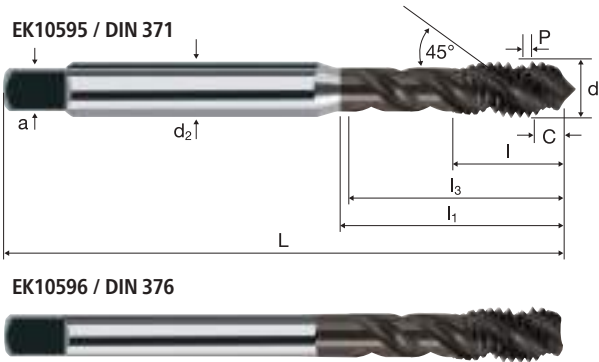


M

ISO 3
(6G)

HSS-E
Co5

Form C



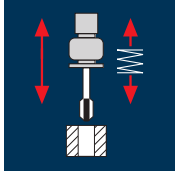
Rm
< 850
HRC
< 24

Rm
850-1100
HRC
24-34

M
MF
G
UN
EG

Example: Order-N°. EK10595 034											TiAlN
Article-N°. EK10595 α-Code 034											EK10595
Ø Code	d	P	L	l	l ₁	l ₃	d ₂	a		Δ	
034	M 2	0.40	45	4.50	13.5	11.5	2.8	2.1	3	+0.015	●
040	M 2.5	0.45	50	5.00	14.5	12.5	2.8	2.1	3	+0.015	●
044	M 3	0.50	56	6.00	18.0	14.0	3.5	2.7	3	+0.016	●
058	M 4	0.70	63	7.50	21.0	17.0	4.5	3.4	3	+0.019	●
084	M 5	0.80	70	8.50	25.0	21.0	6.0	4.9	3	+0.020	●
088	M 6	1.00	80	11.00	30.0	26.0	6.0	4.9	3	+0.024	●
160	M 8	1.25	90	14.00	35.0	31.0	8.0	6.2	3	+0.025	●
174	M 10	1.50	100	16.00	39.0	35.0	10.0	8.0	3	+0.028	●

Example: Order-N°. EK10596 240											TiAlN
Article-N°. EK10596 α-Code 240											EK10596
Ø Code	d	P	L	l	l ₁	l ₃	d ₂	a		Δ	
240	M 12	1.75	110	18.50	49.0	45.0	9.0	7.0	3	+0.032	●
246	M 16	2.00	110	20.00	54.0	50.0	12.0	9.0	4	+0.034	●
314	M 20	2.50	140	25.00	62.0	58.0	16.0	12.0	4	+0.036	●
320	M 24	3.00	160	30.00	73.0	69.0	18.0	14.5	4	+0.042	●

Application	Material	M	d [mm]	P [mm]	v_c 1.5 x d	n [min ⁻¹]	v_f [100%]	v_c 2.0 x d	n [min ⁻¹]	v_f [100%]	v_c 3.0 x d	n [min ⁻¹]	v_f [100%]
	Steel < 500 N/mm ²	M 2	2.000	0.40	14	2230	892	12	1910	764	10	1590	636
		M 2.5	2.500	0.45	14	1785	803	12	1530	689	10	1275	574
		M 3	3.000	0.50	18	1910	955	15	1590	795	12	1275	638
		M 4	4.000	0.70	18	1430	1001	15	1195	837	12	955	669
		M 5	5.000	0.80	18	1145	916	15	955	764	12	765	612
		M 6	6.000	1.00	18	955	955	15	795	795	12	635	635
		M 8	8.000	1.25	18	715	894	15	595	744	12	475	594
		M 10	10.000	1.50	18	575	863	15	475	713	12	380	570
		M 12	12.000	1.75	18	475	831	15	400	700	12	320	560
		M 16	16.000	2.00	18	360	720	15	300	600	12	240	480
	Steel < 500 N/mm ²	M 20	20.000	2.50	18	285	713	15	240	600	12	190	475
		M 24	24.000	3.00	18	240	720	15	200	600	12	160	480
	Steel 500 - 850 N/mm ²	M 2	2.000	0.40	12	1910	764	8	1275	510	6	955	382
		M 2.5	2.500	0.45	12	1530	689	8	1020	459	6	765	344
		M 3	3.000	0.50	15	1590	795	10	1060	530	8	850	425
		M 4	4.000	0.70	15	1195	837	10	795	557	8	635	445
		M 5	5.000	0.80	15	955	764	10	635	508	8	510	408
		M 6	6.000	1.00	15	795	795	10	530	530	8	425	425
		M 8	8.000	1.25	15	595	744	10	400	500	8	320	400
		M 10	10.000	1.50	15	475	713	10	320	480	8	255	383
		M 12	12.000	1.75	15	400	700	10	265	464	8	210	368
		M 16	16.000	2.00	15	300	600	10	200	400	8	160	320
	Steel 500 - 850 N/mm ²	M 20	20.000	2.50	15	240	600	10	160	400	8	125	313
		M 24	24.000	3.00	15	200	600	10	135	405	8	105	315
	Wrought aluminium alloys Si < 6% hardened	M 2	2.000	0.40	12	1910	764	10	1590	636	8	1275	510
		M 2.5	2.500	0.45	12	1530	689	10	1275	574	8	1020	459
		M 3	3.000	0.50	15	1590	795	12	1275	638	10	1060	530
		M 4	4.000	0.70	15	1195	837	12	955	669	10	795	557
		M 5	5.000	0.80	15	955	764	12	765	612	10	635	508
		M 6	6.000	1.00	15	795	795	12	635	635	10	530	530
		M 8	8.000	1.25	15	595	744	12	475	594	10	400	500
		M 10	10.000	1.50	15	475	713	12	380	570	10	320	480
		M 12	12.000	1.75	15	400	700	12	320	560	10	265	464
		M 16	16.000	2.00	15	300	600	12	240	480	10	200	400
	Wrought aluminium alloys Si < 6% hardened	M 20	20.000	2.50	15	240	600	12	190	475	10	160	400
		M 24	24.000	3.00	15	200	600	12	160	480	10	135	405
 	Stainless steel [Cr-Ni/1.4301]	M 2	2.000	0.40	4	635	254	3	475	190	2	320	128
		M 2.5	2.500	0.45	4	510	230	3	380	171	2	255	115
		M 3	3.000	0.50	5	530	265	4	425	213	3	320	160
		M 4	4.000	0.70	5	400	280	4	320	224	3	240	168
		M 5	5.000	0.80	5	320	256	4	255	204	3	190	152
		M 6	6.000	1.00	5	265	265	4	210	210	3	160	160
		M 8	8.000	1.25	5	200	250	4	160	200	3	120	150
		M 10	10.000	1.50	5	160	240	4	125	188	3	95	143
		M 12	12.000	1.75	5	135	236	4	105	184	3	80	140
		M 16	16.000	2.00	5	100	200	4	80	160	3	60	120
 	Stainless steel [Cr-Ni/1.4301]	M 20	20.000	2.50	5	80	200	4	65	163	3	50	125
		M 24	24.000	3.00	5	65	195	4	55	165	3	40	120

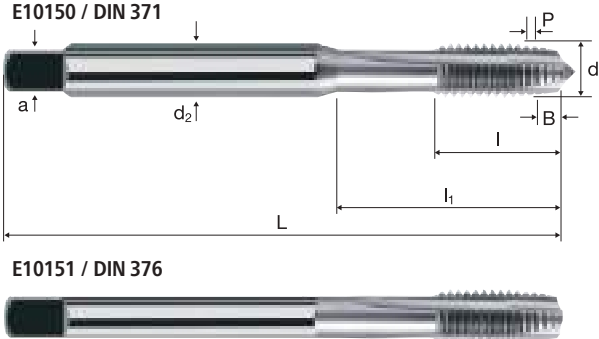


M

7G

HSS-E
Co5

X - P
Form B



Rm
<850
HRC
<24

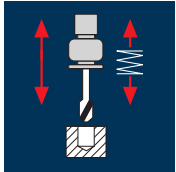
Inox
Stainless

GG(G)
Aluminium
Copper

M
MF
G
UN
EG

Example: Order-N°.										Article-N°.		a-Code			
										E10150		034		E10150	
Ø Code	d	P	L	l	l ₁	d ₂	a		Δ						
034	M 2	0.40	45	8.00	13.5	2.8	2.1	3	+0.030	●					
040	M 2.5	0.45	50	9.00	14.5	2.8	2.1	3	+0.030	●					
044	M 3	0.50	56	10.00	18.0	3.5	2.7	3	+0.032	●					
058	M 4	0.70	63	12.00	21.0	4.5	3.4	3	+0.038	●					
084	M 5	0.80	70	14.00	25.0	6.0	4.9	3	+0.040	●					
088	M 6	1.00	80	16.00	30.0	6.0	4.9	3	+0.048	●					
160	M 8	1.25	90	17.00	35.0	8.0	6.2	3	+0.050	●					
174	M 10	1.50	100	20.00	39.0	10.0	8.0	3	+0.056	●					

Example: Order-N°.										Article-N°.		a-Code			
										E10151		240		E10151	
Ø Code	d	P	L	l	l ₁	d ₂	a		Δ						
240	M 12	1.75	110	24.00	49.0	9.0	7.0	4	+0.064	●					
246	M 16	2.00	110	26.00	54.0	12.0	9.0	4	+0.068	●					
314	M 20	2.50	140	32.00	62.0	16.0	12.0	4	+0.072	●					
320	M 24	3.00	160	36.00	73.0	18.0	14.5	4	+0.085	●					

Application	Material	M	d [mm]	P [mm]	v_c 1.0 x d	n [min ⁻¹]	v_f [100%]	v_c 1.5 x d	n [min ⁻¹]	v_f [100%]	v_c 2.0 x d	n [min ⁻¹]	v_f [100%]
	Steel < 500 N/mm ²	M 2	2.000	0.40	11	1750	700	10	1590	636	8	1275	510
		M 2.5	2.500	0.45	11	1400	630	10	1275	574	8	1020	459
		M 3	3.000	0.50	14	1485	743	12	1275	638	10	1060	530
		M 4	4.000	0.70	14	1115	781	12	955	669	10	795	557
		M 5	5.000	0.80	14	890	712	12	765	612	10	635	508
		M 6	6.000	1.00	14	745	745	12	635	635	10	530	530
		M 8	8.000	1.25	14	555	694	12	475	594	10	400	500
		M 10	10.000	1.50	14	445	668	12	380	570	10	320	480
		M 12	12.000	1.75	14	370	648	12	320	560	10	265	464
		M 16	16.000	2.00	14	280	560	12	240	480	10	200	400
	Steel < 500 N/mm ²	M 20	20.000	2.50	14	225	563	12	190	475	10	160	400
		M 24	24.000	3.00	14	185	555	12	160	480	10	135	405
	Steel 500 - 850 N/mm ²	M 2	2.000	0.40	7	1115	446	6	955	382	5	795	318
		M 2.5	2.500	0.45	7	890	401	6	765	344	5	635	286
		M 3	3.000	0.50	9	955	478	8	850	425	7	745	373
		M 4	4.000	0.70	9	715	501	8	635	445	7	555	389
		M 5	5.000	0.80	9	575	460	8	510	408	7	445	356
		M 6	6.000	1.00	9	475	475	8	425	425	7	370	370
		M 8	8.000	1.25	9	360	450	8	320	400	7	280	350
		M 10	10.000	1.50	9	285	428	8	255	383	7	225	338
		M 12	12.000	1.75	9	240	420	8	210	368	7	185	324
		M 16	16.000	2.00	9	180	360	8	160	320	7	140	280
	Steel 500 - 850 N/mm ²	M 20	20.000	2.50	9	145	363	8	125	313	7	110	275
		M 24	24.000	3.00	9	120	360	8	105	315	7	95	285
	Wrought aluminium alloys Si < 6% hardened	M 2	2.000	0.40	8	1275	510	6	955	382	5	795	318
		M 2.5	2.500	0.45	8	1020	459	6	765	344	5	635	286
		M 3	3.000	0.50	10	1060	530	8	850	425	6	635	318
		M 4	4.000	0.70	10	795	557	8	635	445	6	475	333
		M 5	5.000	0.80	10	635	508	8	510	408	6	380	304
		M 6	6.000	1.00	10	530	530	8	425	425	6	320	320
		M 8	8.000	1.25	10	400	500	8	320	400	6	240	300
		M 10	10.000	1.50	10	320	480	8	255	383	6	190	285
		M 12	12.000	1.75	10	265	464	8	210	368	6	160	280
		M 16	16.000	2.00	10	200	400	8	160	320	6	120	240
	Wrought aluminium alloys Si < 6% hardened	M 20	20.000	2.50	10	160	400	8	125	313	6	95	238
		M 24	24.000	3.00	10	135	405	8	105	315	6	80	240
 	Stainless steel [Cr-Ni/1.4301]	M 2	2.000	0.40	3	475	190	2	320	128	2	320	128
		M 2.5	2.500	0.45	3	380	171	2	255	115	2	255	115
		M 3	3.000	0.50	4	425	213	3	320	160	3	320	160
		M 4	4.000	0.70	4	320	224	3	240	168	3	240	168
		M 5	5.000	0.80	4	255	204	3	190	152	3	190	152
		M 6	6.000	1.00	4	210	210	3	160	160	3	160	160
		M 8	8.000	1.25	4	160	200	3	120	150	3	120	150
		M 10	10.000	1.50	4	125	188	3	95	143	3	95	143
		M 12	12.000	1.75	4	105	184	3	80	140	3	80	140
		M 16	16.000	2.00	4	80	160	3	60	120	3	60	120
 	Stainless steel [Cr-Ni/1.4301]	M 20	20.000	2.50	4	65	163	3	50	125	3	50	125
		M 24	24.000	3.00	4	55	165	3	40	120	3	40	120

Taps

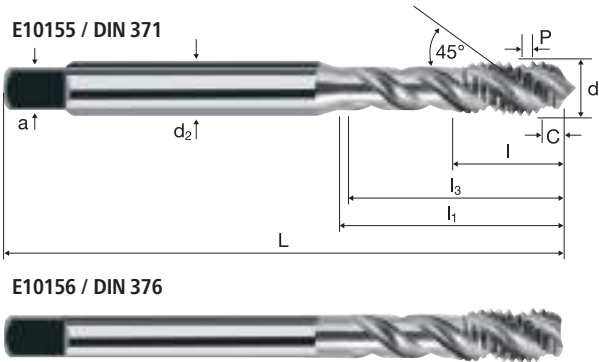


M

7G

HSS-E
Co5

X - P
Form C



Rm
<850
HRC
<24

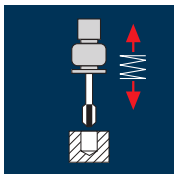
Inox
Stainless

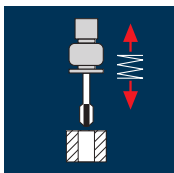
GG(G)
Aluminium
Copper

M
MF
G
UN
EG

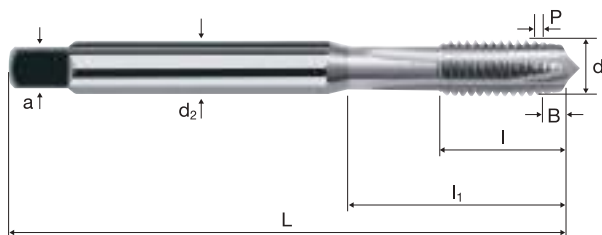
Example: Order-N°.											Article-N°.		α-Code			
											E10155		034			
Ø Code	d	P	L	l	l ₁	l ₃	d ₂	a		Δ						
034	M 2	0.40	45	4.50	13.5	-	2.8	2.1	3	+0.030	●					
040	M 2.5	0.45	50	5.00	14.5	12.5	2.8	2.1	3	+0.030	●					
044	M 3	0.50	56	6.00	18.0	14.0	3.5	2.7	3	+0.032	●					
058	M 4	0.70	63	7.50	21.0	17.0	4.5	3.4	3	+0.038	●					
084	M 5	0.80	70	8.50	25.0	21.0	6.0	4.9	3	+0.040	●					
088	M 6	1.00	80	11.00	30.0	26.0	6.0	4.9	3	+0.048	●					
160	M 8	1.25	90	14.00	35.0	31.0	8.0	6.2	3	+0.050	●					
174	M 10	1.50	100	16.00	39.0	35.0	10.0	8.0	3	+0.056	●					

Example: Order-N°.											Article-N°.		α-Code			
											E10156		240			
Ø Code	d	P	L	l	l ₁	l ₃	d ₂	a		Δ						
240	M 12	1.75	110	18.50	49.0	45.0	9.0	7.0	3	+0.064	●					
246	M 16	2.00	110	20.00	54.0	50.0	12.0	9.0	4	+0.068	●					
314	M 20	2.50	140	25.00	62.0	58.0	16.0	12.0	4	+0.072	●					
320	M 24	3.00	160	30.00	73.0	69.0	18.0	14.5	4	+0.085	●					

Application	Material	MJ	d [mm]	P [mm]	v_c 1.0 x d	n [min ⁻¹]	v_f [100%]	v_c 1.5 x d	n [min ⁻¹]	v_f [100%]
	Nickel base alloys hardened	MJ 3	3.000	0.50	2	210	105	2	210	105
		MJ 4	4.000	0.70	2	160	112	2	160	112
		MJ 5	5.000	0.80	2	125	100	2	125	100
		MJ 6	6.000	1.00	2	105	105	2	105	105
		MJ 8	8.000	1.00	2	80	80	2	80	80
		MJ 8	8.000	1.25	2	80	100	2	80	100
		MJ 10	10.000	1.25	2	65	81	2	65	81
		MJ 10	10.000	1.50	2	65	98	2	65	98
	Nickel base alloys not hardened	MJ 3	3.000	0.50	3	320	160	2	210	105
		MJ 4	4.000	0.70	3	240	168	2	160	112
		MJ 5	5.000	0.80	3	190	152	2	125	100
		MJ 6	6.000	1.00	3	160	160	2	105	105
		MJ 8	8.000	1.00	3	120	120	2	80	80
		MJ 8	8.000	1.25	3	120	150	2	80	100
		MJ 10	10.000	1.25	3	95	119	2	65	81
		MJ 10	10.000	1.50	3	95	143	2	65	98

Application	Material	MJ	d [mm]	P [mm]	v_c 1.0 x d	n [min ⁻¹]	v_f [100%]	v_c 1.5 x d	n [min ⁻¹]	v_f [100%]
	Nickel base alloys hardened	MJ 3	3.000	0.50	2	210	105	2	210	105
		MJ 4	4.000	0.70	2	160	112	2	160	112
		MJ 5	5.000	0.80	2	125	100	2	125	100
		MJ 6	6.000	1.00	2	105	105	2	105	105
		MJ 8	8.000	1.00	2	80	80	2	80	80
		MJ 8	8.000	1.25	2	80	100	2	80	100
		MJ 10	10.000	1.25	2	65	81	2	65	81
		MJ 10	10.000	1.50	2	65	98	2	65	98
	Nickel base alloys not hardened	MJ 3	3.000	0.50	3	320	160	2	210	105
		MJ 4	4.000	0.70	3	240	168	2	160	112
		MJ 5	5.000	0.80	3	190	152	2	125	100
		MJ 6	6.000	1.00	3	160	160	2	105	105
		MJ 8	8.000	1.00	3	120	120	2	80	80
		MJ 8	8.000	1.25	3	120	150	2	80	100
		MJ 10	10.000	1.25	3	95	119	2	65	81
		MJ 10	10.000	1.50	3	95	143	2	65	98

4H



Nickel-Alloys

M
MF
G
UN
EG

[illegible]



Metric fine thread MF

Tolerance ISO 2 (6H)

N° EK11200



HSS-E
Co5



Rm
850-1100
HRC
24-34

Ti
Titanium

277

N° EK11210



HSS-E
Co5



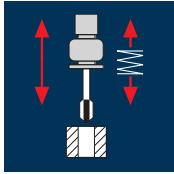
Rm
850-1100
HRC
24-34

Ti
Titanium

281

- M
- MF**
- G
- UN
- EG

Application



Material

Steel
500 - 850 N/mm²



Steel
500 - 850 N/mm²



Steel
850 - 1100 N/mm²



Steel
850 - 1100 N/mm²



Stainless steel
ferritic/martensitic



Stainless steel
ferritic/martensitic



Stainless steel
[Cr-Ni/1.4301]



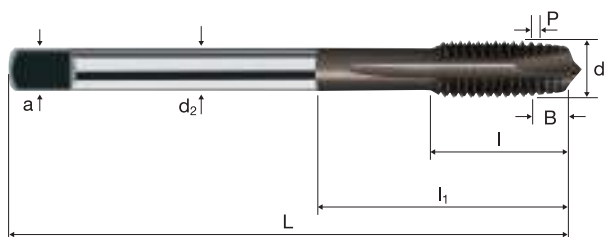
Stainless steel
[Cr-Ni/1.4301]



MF	d [mm]	P [mm]	v _c 1.5 x d			v _c 2.0 x d			v _c 3.0 x d		
			n [min ⁻¹]	f _r [100%]	v _f [100%]	n [min ⁻¹]	f _r [100%]	v _f [100%]	n [min ⁻¹]	f _r [100%]	v _f [100%]
M 3	3.000	0.35	25	2655	929	20	2120	742	15	1590	557
M 4	4.000	0.50	25	1990	995	20	1590	795	15	1195	598
M 5	5.000	0.50	25	1590	795	20	1275	638	15	955	478
M 6	6.000	0.50	25	1325	663	20	1060	530	15	795	398
M 6	6.000	0.75	25	1325	994	20	1060	795	15	795	596
M 8	8.000	0.75	25	995	746	20	795	596	15	595	446
M 10	10.000	0.75	25	795	596	20	635	476	15	475	356
M 8	8.000	1.00	25	995	995	20	795	795	15	595	595
M 9	9.000	1.00	25	885	885	20	705	705	15	530	530
M 10	10.000	1.00	25	795	795	20	635	635	15	475	475
M 10	10.000	1.25	25	795	994	20	635	794	15	475	594
M 3	3.000	0.35	20	2120	742	15	1590	557	12	1275	446
M 4	4.000	0.50	20	1590	795	15	1195	598	12	955	478
M 5	5.000	0.50	20	1275	638	15	955	478	12	765	383
M 6	6.000	0.50	20	1060	530	15	795	398	12	635	318
M 6	6.000	0.75	20	1060	795	15	795	596	12	635	476
M 8	8.000	0.75	20	795	596	15	595	446	12	475	356
M 10	10.000	0.75	20	635	476	15	475	356	12	380	285
M 8	8.000	1.00	20	795	795	15	595	595	12	475	475
M 9	9.000	1.00	20	705	705	15	530	530	12	425	425
M 10	10.000	1.00	20	635	635	15	475	475	12	380	380
M 10	10.000	1.25	20	635	794	15	475	594	12	380	475
M 3	3.000	0.35	12	1275	446	10	1060	371	8	850	298
M 4	4.000	0.50	12	955	478	10	795	398	8	635	318
M 5	5.000	0.50	12	765	383	10	635	318	8	510	255
M 6	6.000	0.50	12	635	318	10	530	265	8	425	213
M 6	6.000	0.75	12	635	476	10	530	398	8	425	319
M 8	8.000	0.75	12	475	356	10	400	300	8	320	240
M 10	10.000	0.75	12	380	285	10	320	240	8	255	191
M 8	8.000	1.00	12	475	475	10	400	400	8	320	320
M 9	9.000	1.00	12	425	425	10	355	355	8	285	285
M 10	10.000	1.00	12	380	380	10	320	320	8	255	255
M 10	10.000	1.25	12	380	475	10	320	400	8	255	319
M 3	3.000	0.35	7	745	261	5	530	186	4	425	149
M 4	4.000	0.50	7	555	278	5	400	200	4	320	160
M 5	5.000	0.50	7	445	223	5	320	160	4	255	128
M 6	6.000	0.50	7	370	185	5	265	133	4	210	105
M 6	6.000	0.75	7	370	278	5	265	199	4	210	158
M 8	8.000	0.75	7	280	210	5	200	150	4	160	120
M 10	10.000	0.75	7	225	169	5	160	120	4	125	94
M 8	8.000	1.00	7	280	280	5	200	200	4	160	160
M 9	9.000	1.00	7	250	250	5	175	175	4	140	140
M 10	10.000	1.00	7	225	225	5	160	160	4	125	125
M 10	10.000	1.25	7	225	281	5	160	200	4	125	156

P

ISO 2
(6H)



Rm
850-1100
HRC
24-34



Inox
Stainless

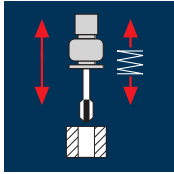


11

M
MF
G
UN
EG

277

Application



Material

Steel
500 - 850 N/mm²



Steel
500 - 850 N/mm²



Steel
850 - 1100 N/mm²



Steel
850 - 1100 N/mm²



Stainless steel
ferritic/martensitic



Stainless steel
ferritic/martensitic



Stainless steel
[Cr-Ni/1.4301]



Stainless steel
[Cr-Ni/1.4301]



MF	d [mm]	P [mm]	v _c 1.5 x d			v _c 2.0 x d			v _c 3.0 x d		
			n [min ⁻¹]	f _r [100%]		n [min ⁻¹]	f _r [100%]		n [min ⁻¹]	f _r [100%]	
M 12	12.000	1.00	25	665	665	20	530	530	15	400	400
M 14	14.000	1.00	25	570	570	20	455	455	15	340	340
M 16	16.000	1.00	25	495	495	20	400	400	15	300	300
M 18	18.000	1.00	25	440	440	20	355	355	15	265	265
M 20	20.000	1.00	25	400	400	20	320	320	15	240	240
M 12	12.000	1.25	25	665	831	20	530	663	15	400	500
M 14	14.000	1.25	25	570	713	20	455	569	15	340	425
M 12	12.000	1.50	25	665	998	20	530	795	15	400	600
M 14	14.000	1.50	25	570	855	20	455	683	15	340	510
M 16	16.000	1.50	25	495	743	20	400	600	15	300	450
M 18	18.000	1.50	25	440	660	20	355	533	15	265	398
M 20	20.000	1.50	25	400	600	20	320	480	15	240	360
M 22	22.000	1.50	25	360	540	20	290	435	15	215	323
M 24	24.000	1.50	25	330	495	20	265	398	15	200	300
M 12	12.000	1.00	20	530	530	15	400	400	12	320	320
M 14	14.000	1.00	20	455	455	15	340	340	12	275	275
M 16	16.000	1.00	20	400	400	15	300	300	12	240	240
M 18	18.000	1.00	20	355	355	15	265	265	12	210	210
M 20	20.000	1.00	20	320	320	15	240	240	12	190	190
M 12	12.000	1.25	20	530	663	15	400	500	12	320	400
M 14	14.000	1.25	20	455	569	15	340	425	12	275	344
M 12	12.000	1.50	20	530	795	15	400	600	12	320	480
M 14	14.000	1.50	20	455	683	15	340	510	12	275	413
M 16	16.000	1.50	20	400	600	15	300	450	12	240	360
M 18	18.000	1.50	20	355	533	15	265	398	12	210	315
M 20	20.000	1.50	20	320	480	15	240	360	12	190	285
M 22	22.000	1.50	20	290	435	15	215	323	12	175	263
M 24	24.000	1.50	20	265	398	15	200	300	12	160	240
M 12	12.000	1.00	12	320	320	10	265	265	8	210	210
M 14	14.000	1.00	12	275	275	10	225	225	8	180	180
M 16	16.000	1.00	12	240	240	10	200	200	8	160	160
M 18	18.000	1.00	12	210	210	10	175	175	8	140	140
M 20	20.000	1.00	12	190	190	10	160	160	8	125	125
M 12	12.000	1.25	12	320	400	10	265	331	8	210	263
M 14	14.000	1.25	12	275	344	10	225	281	8	180	225
M 12	12.000	1.50	12	320	480	10	265	398	8	210	315
M 14	14.000	1.50	12	275	413	10	225	338	8	180	270
M 16	16.000	1.50	12	240	360	10	200	300	8	160	240
M 18	18.000	1.50	12	210	315	10	175	263	8	140	210
M 20	20.000	1.50	12	190	285	10	160	240	8	125	188
M 22	22.000	1.50	12	175	263	10	145	218	8	115	173
M 24	24.000	1.50	12	160	240	10	135	203	8	105	158
M 12	12.000	1.00	7	185	185	5	135	135	4	105	105
M 14	14.000	1.00	7	160	160	5	115	115	4	90	90
M 16	16.000	1.00	7	140	140	5	100	100	4	80	80
M 18	18.000	1.00	7	125	125	5	90	90	4	70	70
M 20	20.000	1.00	7	110	110	5	80	80	4	65	65
M 12	12.000	1.25	7	185	231	5	135	169	4	105	131
M 14	14.000	1.25	7	160	200	5	115	144	4	90	113
M 12	12.000	1.50	7	185	278	5	135	203	4	105	158
M 14	14.000	1.50	7	160	240	5	115	173	4	90	135
M 16	16.000	1.50	7	140	210	5	100	150	4	80	120
M 18	18.000	1.50	7	125	188	5	90	135	4	70	105
M 20	20.000	1.50	7	110	165	5	80	120	4	65	98
M 22	22.000	1.50	7	100	150	5	70	105	4	60	90
M 24	24.000	1.50	7	95	143	5	65	98	4	55	83

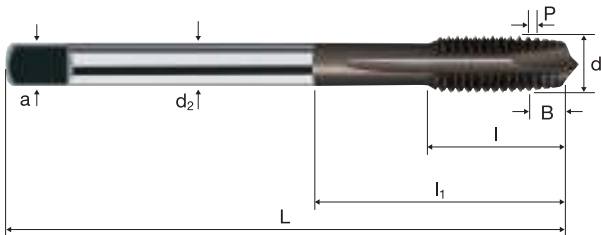
Taps



MF

ISO 2
(6H)

HSS-E
Co5



Rm
< 850
HRC
< 24

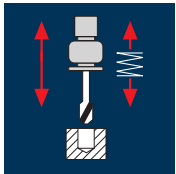
Rm
850-1100
HRC
24-34

Rm
1100-1300
HRC
34-42

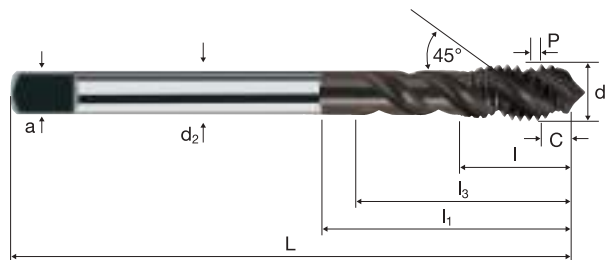
Inox
Stainless

M
MF
G
UN
EG

Example: Order-N°.											Article-N°. ø-Code	
											EK11200 094	
Ø Code	d	P	L	I	I ₁	d ₂	a				TiAlN	
											EK11200	
094	M 12	1.00	100	20.00	40.0	9.0	7.0	4	11.00		●	
096	M 14	1.00	100	20.00	40.0	11.0	9.0	4	13.00		●	
098	M 16	1.00	100	22.00	44.0	12.0	9.0	4	15.00		●	
100	M 18	1.00	110	25.00	44.0	14.0	11.0	4	17.00		●	
102	M 20	1.00	125	25.00	44.0	16.0	12.0	4	19.00		●	
162	M 10	1.25	100	20.00	39.0	7.0	5.5	3	8.80		●	
164	M 12	1.25	100	20.00	40.0	9.0	7.0	4	10.80		●	
166	M 14	1.25	100	20.00	40.0	11.0	9.0	4	12.80		●	
176	M 12	1.50	100	20.00	40.0	9.0	7.0	4	10.50		●	
178	M 14	1.50	100	20.00	40.0	11.0	9.0	4	12.50		●	
180	M 16	1.50	100	22.00	44.0	12.0	9.0	4	14.50		●	
182	M 18	1.50	110	25.00	44.0	14.0	11.0	4	16.50		●	
184	M 20	1.50	125	25.00	44.0	16.0	12.0	4	18.50		●	
186	M 22	1.50	125	25.00	44.0	18.0	14.5	4	20.50		●	
188	M 24	1.50	140	28.00	48.0	18.0	14.5	4	22.50		●	

Application	Material	MF	d [mm]	P [mm]	v_c 1.0 x d	n [min ⁻¹]	v_f [100%]	v_c 1.5 x d	n [min ⁻¹]	v_f [100%]	v_c 2.0 x d	n [min ⁻¹]	v_f [100%]
	Steel 500 - 850 N/mm ²	M 3	3.000	0.35	32	3395	1188	28	2970	1040	22	2335	817
		M 4	4.000	0.50	32	2545	1273	28	2230	1115	22	1750	875
		M 5	5.000	0.50	32	2035	1018	28	1785	893	22	1400	700
		M 6	6.000	0.50	32	1700	850	28	1485	743	22	1165	583
		M 6	6.000	0.75	32	1700	1275	28	1485	1114	22	1165	874
		M 8	8.000	0.75	32	1275	956	28	1115	836	22	875	656
		M 10	10.000	0.75	32	1020	765	28	890	668	22	700	525
		M 8	8.000	1.00	32	1275	1275	28	1115	1115	22	875	875
		M 9	9.000	1.00	32	1130	1130	28	990	990	22	780	780
		M 10	10.000	1.00	32	1020	1020	28	890	890	22	700	700
	Steel 500 - 850 N/mm ²	M 10	10.000	1.25	32	1020	1275	28	890	1113	22	700	875
													
	Steel 850 - 1100 N/mm ²	M 3	3.000	0.35	20	2120	742	16	1700	595	10	1060	371
		M 4	4.000	0.50	20	1590	795	16	1275	638	10	795	398
		M 5	5.000	0.50	20	1275	638	16	1020	510	10	635	318
		M 6	6.000	0.50	20	1060	530	16	850	425	10	530	265
		M 6	6.000	0.75	20	1060	795	16	850	638	10	530	398
		M 8	8.000	0.75	20	795	596	16	635	476	10	400	300
		M 10	10.000	0.75	20	635	476	16	510	383	10	320	240
		M 8	8.000	1.00	20	795	795	16	635	635	10	400	400
		M 9	9.000	1.00	20	705	705	16	565	565	10	355	355
		M 10	10.000	1.00	20	635	635	16	510	510	10	320	320
		M 10	10.000	1.25	20	635	794	16	510	638	10	320	400
	Steel 850 - 1100 N/mm ²												
													
	Stainless steel ferritic/martensitic	M 3	3.000	0.35	10	1060	371	8	850	298	6	635	222
	 	M 4	4.000	0.50	10	795	398	8	635	318	6	475	238
		M 5	5.000	0.50	10	635	318	8	510	255	6	380	190
		M 6	6.000	0.50	10	530	265	8	425	213	6	320	160
		M 6	6.000	0.75	10	530	398	8	425	319	6	320	240
		M 8	8.000	0.75	10	400	300	8	320	240	6	240	180
		M 10	10.000	0.75	10	320	240	8	255	191	6	190	143
		M 8	8.000	1.00	10	400	400	8	320	320	6	240	240
		M 9	9.000	1.00	10	355	355	8	285	285	6	210	210
		M 10	10.000	1.00	10	320	320	8	255	255	6	190	190
		M 10	10.000	1.25	10	320	400	8	255	319	6	190	238
	Stainless steel ferritic/martensitic												
	 												
	Stainless steel [Cr-Ni/1.4301]	M 3	3.000	0.35	5	530	186	4	425	149	3	320	112
	 	M 4	4.000	0.50	5	400	200	4	320	160	3	240	120
		M 5	5.000	0.50	5	320	160	4	255	128	3	190	95
		M 6	6.000	0.50	5	265	133	4	210	105	3	160	80
		M 6	6.000	0.75	5	265	199	4	210	158	3	160	120
		M 8	8.000	0.75	5	200	150	4	160	120	3	120	90
		M 10	10.000	0.75	5	160	120	4	125	94	3	95	71
		M 8	8.000	1.00	5	200	200	4	160	160	3	120	120
		M 9	9.000	1.00	5	175	175	4	140	140	3	105	105
		M 10	10.000	1.00	5	160	160	4	125	125	3	95	95
		M 10	10.000	1.25	5	160	200	4	125	156	3	95	119
	Stainless steel [Cr-Ni/1.4301]												
	 												

ISO 2
(6H)



Rm
850-1100
HRC
24-34

Inox
Stainless

M
MF
G
UN
EG

frais.com

Application	Material	MF	d [mm]	P [mm]	v_c 1.0x d	n [min ⁻¹]	v_f [100%]	v_c 1.5x d	n [min ⁻¹]	v_f [100%]	v_c 2.0x d	n [min ⁻¹]	v_f [100%]	
	Steel 500 - 850 N/mm ² 	M 12	12.000	1.00	32	850	850	28	745	745	22	585	585	
		M 14	14.000	1.00	32	730	730	28	635	635	22	500	500	
		M 16	16.000	1.00	32	635	635	28	555	555	22	440	440	
		M 18	18.000	1.00	32	565	565	28	495	495	22	390	390	
		M 20	20.000	1.00	32	510	510	28	445	445	22	350	350	
		M 12	12.000	1.25	32	850	1063	28	745	931	22	585	731	
		M 14	14.000	1.25	32	730	913	28	635	794	22	500	625	
		M 12	12.000	1.50	32	850	1275	28	745	1118	22	585	878	
		M 14	14.000	1.50	32	730	1095	28	635	953	22	500	750	
	Steel 500 - 850 N/mm ² 	M 16	16.000	1.50	32	635	953	28	555	833	22	440	660	
		M 18	18.000	1.50	32	565	848	28	495	743	22	390	585	
		M 20	20.000	1.50	32	510	765	28	445	668	22	350	525	
		M 22	22.000	1.50	32	465	698	28	405	608	22	320	480	
		M 24	24.000	1.50	32	425	638	28	370	555	22	290	435	
	Steel 850 - 1100 N/mm ² 	M 12	12.000	1.00	20	530	530	16	425	425	10	265	265	
		M 14	14.000	1.00	20	455	455	16	365	365	10	225	225	
		M 16	16.000	1.00	20	400	400	16	320	320	10	200	200	
		M 18	18.000	1.00	20	355	355	16	285	285	10	175	175	
		M 20	20.000	1.00	20	320	320	16	255	255	10	160	160	
		M 12	12.000	1.25	20	530	663	16	425	531	10	265	331	
		M 14	14.000	1.25	20	455	569	16	365	456	10	225	281	
		M 12	12.000	1.50	20	530	795	16	425	638	10	265	398	
		M 14	14.000	1.50	20	455	683	16	365	548	10	225	338	
	Steel 850 - 1100 N/mm ² 	M 16	16.000	1.50	20	400	600	16	320	480	10	200	300	
		M 18	18.000	1.50	20	355	533	16	285	428	10	175	263	
		M 20	20.000	1.50	20	320	480	16	255	383	10	160	240	
		M 22	22.000	1.50	20	290	435	16	230	345	10	145	218	
		M 24	24.000	1.50	20	265	398	16	210	315	10	135	203	
	Stainless steel ferritic/martensitic 	M 12	12.000	1.00	10	265	265	8	210	210	6	160	160	
		M 14	14.000	1.00	10	225	225	8	180	180	6	135	135	
		M 16	16.000	1.00	10	200	200	8	160	160	6	120	120	
		M 18	18.000	1.00	10	175	175	8	140	140	6	105	105	
		M 20	20.000	1.00	10	160	160	8	125	125	6	95	95	
		M 12	12.000	1.25	10	265	331	8	210	263	6	160	200	
		M 14	14.000	1.25	10	225	281	8	180	225	6	135	169	
		M 12	12.000	1.50	10	265	398	8	210	315	6	160	240	
		M 14	14.000	1.50	10	225	338	8	180	270	6	135	203	
	Stainless steel ferritic/martensitic 	M 16	16.000	1.50	10	200	300	8	160	240	6	120	180	
		M 18	18.000	1.50	10	175	263	8	140	210	6	105	158	
		M 20	20.000	1.50	10	160	240	8	125	188	6	95	143	
		M 22	22.000	1.50	10	145	218	8	115	173	6	85	128	
		M 24	24.000	1.50	10	135	203	8	105	158	6	80	120	
	Stainless steel [Cr-Ni/1.4301] 	M 12	12.000	1.00	5	135	135	4	105	105	3	80	80	
		M 14	14.000	1.00	5	115	115	4	90	90	3	70	70	
		M 16	16.000	1.00	5	100	100	4	80	80	3	60	60	
		M 18	18.000	1.00	5	90	90	4	70	70	3	55	55	
		M 20	20.000	1.00	5	80	80	4	65	65	3	50	50	
		M 12	12.000	1.25	5	135	169	4	105	131	3	80	100	
		M 14	14.000	1.25	5	115	144	4	90	113	3	70	88	
		M 12	12.000	1.50	5	135	203	4	105	158	3	80	120	
		M 14	14.000	1.50	5	115	173	4	90	135	3	70	105	
	Stainless steel [Cr-Ni/1.4301] 	M 16	16.000	1.50	5	100	150	4	80	120	3	60	90	
		M 18	18.000	1.50	5	90	135	4	70	105	3	55	83	
		M 20	20.000	1.50	5	80	120	4	65	98	3	50	75	
		M 22	22.000	1.50	5	70	105	4	60	90	3	45	68	
		M 24	24.000	1.50	5	65	98	4	55	83	3	40	60	

Taps

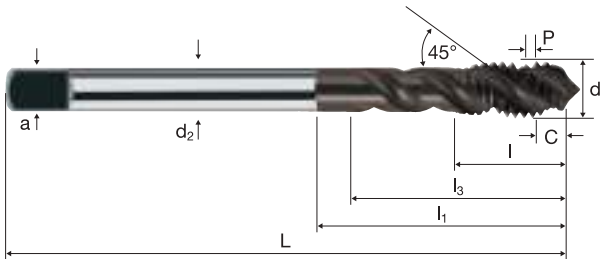


MF

ISO 2
(6H)

HSS-E
Co5

X - P
Form C



Rm
< 850
HRC
< 24

Rm
850-1100
HRC
24-34

Inox
Stainless

M
MF
G
UN
EG

											TiAlN	
											EK11210	
Ø Code	d	P	L	l	l ₁	l ₃	d ₂	a				
094	M 12	1.00	100	11.00	40.0	36.0	9.0	7.0	3	11.00		●
096	M 14	1.00	100	11.00	40.0	36.0	11.0	9.0	3	13.00		●
098	M 16	1.00	100	11.00	44.0	40.0	12.0	9.0	4	15.00		●
100	M 18	1.00	110	12.00	44.0	40.0	14.0	11.0	4	17.00		●
102	M 20	1.00	125	12.00	44.0	40.0	16.0	12.0	4	19.00		●
162	M 10	1.25	100	14.00	39.0	35.0	7.0	5.5	3	8.80		●
164	M 12	1.25	100	15.00	40.0	36.0	9.0	7.0	3	10.80		●
166	M 14	1.25	100	15.00	40.0	36.0	11.0	9.0	3	12.80		●
176	M 12	1.50	100	15.00	40.0	36.0	9.0	7.0	3	10.50		●
178	M 14	1.50	100	15.00	40.0	36.0	11.0	9.0	3	12.50		●
180	M 16	1.50	100	15.00	44.0	40.0	12.0	9.0	4	14.50		●
182	M 18	1.50	110	16.00	44.0	40.0	14.0	11.0	4	16.50		●
184	M 20	1.50	125	16.00	44.0	40.0	16.0	12.0	4	18.50		●
186	M 22	1.50	125	16.00	44.0	40.0	18.0	14.5	4	20.50		●
188	M 24	1.50	140	16.00	48.0	44.0	18.0	14.5	4	22.50		●



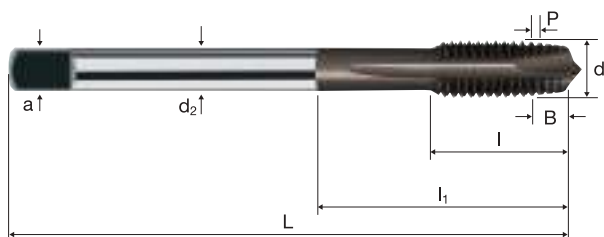
Whitworth pipe thread cylindrical G

G					
N° EK11400			HSS-E Co5	 Rm 850-1100 HRC 24-34	Inox Stainless 287
N° EK11410			HSS-E Co5	 Rm 850-1100 HRC 24-34	Inox Stainless 289

- M
- MF
- G
- UN
- EG

Application	Material	G	d [mm]	P [mm]	v_c 1.5 x d [min ⁻¹]	v_f [100%]	v_c 2.0 x d [min ⁻¹]	v_f [100%]	v_c 3.0 x d [min ⁻¹]	v_f [100%]
	Steel 500 - 850 N/mm²	G 1/8	9.728	0.91	25	820	744	20	655	594
		G 1/4	13.157	1.34	25	605	809	20	485	648
		G 3/8	16.662	1.34	25	480	642	20	380	508
		G 1/2	20.955	1.81	25	380	689	20	305	553
	Steel 850 - 1100 N/mm²	G 1/8	9.728	0.91	20	655	594	15	490	444
		G 1/4	13.157	1.34	20	485	648	15	365	488
		G 3/8	16.662	1.34	20	380	508	15	285	381
		G 1/2	20.955	1.81	20	305	553	15	230	417
	Steel 1100 - 1300 N/mm²	G 1/8	9.728	0.91	7	230	209	4	130	118
		G 1/4	13.157	1.34	7	170	227	4	95	127
		G 3/8	16.662	1.34	7	135	181	4	75	100
		G 1/2	20.955	1.81	7	105	191	4	60	109
	Stainless steel ferritic/martensitic	G 1/8	9.728	0.91	12	395	358	10	325	295
		G 1/4	13.157	1.34	12	290	388	10	240	321
		G 3/8	16.662	1.34	12	230	308	10	190	254
		G 1/2	20.955	1.81	12	180	327	10	150	272
	Stainless steel [Cr-Ni/1.4301]	G 1/8	9.728	0.91	7	230	209	5	165	150
		G 1/4	13.157	1.34	7	170	227	5	120	160
		G 3/8	16.662	1.34	7	135	181	5	95	127
		G 1/2	20.955	1.81	7	105	191	5	75	136
	Stainless steel [Cr-Ni-Mo-.../1.4571]	G 1/8	9.728	0.91	8	260	236	6	195	177
		G 1/4	13.157	1.34	8	195	261	6	145	194
		G 3/8	16.662	1.34	8	155	207	6	115	154
		G 1/2	20.955	1.81	8	120	218	6	90	163
	Heat resistant steel [17-4 PH]	G 1/8	9.728	0.91	5	165	150	4	130	118
		G 1/4	13.157	1.34	5	120	160	4	95	127
		G 3/8	16.662	1.34	5	95	127	4	75	100
		G 1/2	20.955	1.81	5	75	136	4	60	109

P



Rm
850-1100
HRC
24-34



114

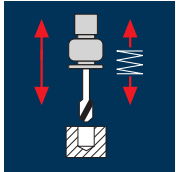
Inox
Stainless



10

M
MF
G
UN
EG

[illegible]

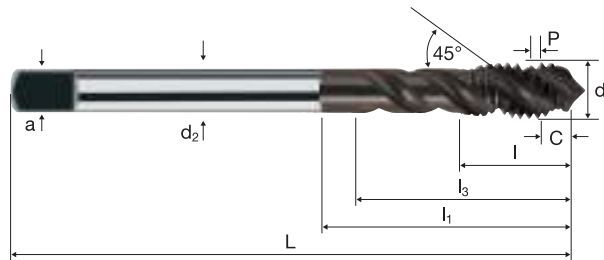
Application	Material	G	d [mm]	P [mm]	v_c 1.0 x d [min ⁻¹]	n [min ⁻¹]	v_f [100%]	v_c 1.5 x d [min ⁻¹]	n [min ⁻¹]	v_f [100%]	v_c 2.0 x d [min ⁻¹]	n [min ⁻¹]	v_f [100%]
	Steel 500 - 850 N/mm ² 	G 1/8	9.728	0.907	32	1045	948	28	915	830	22	720	653
		G 1/4	13.157	1.337	32	775	1036	28	675	902	22	530	709
		G 3/8	16.662	1.337	32	610	815	28	535	715	22	420	562
		G 1/2	20.955	1.814	32	485	880	28	425	771	22	335	608
	Steel 850 - 1100 N/mm ² 	G 1/8	9.728	0.907	20	655	594	16	525	476	10	325	295
		G 1/4	13.157	1.337	20	485	648	16	385	515	10	240	321
		G 3/8	16.662	1.337	20	380	508	16	305	408	10	190	254
		G 1/2	20.955	1.814	20	305	553	16	245	445	10	150	272
	Stainless steel ferritic/martensitic 	G 1/8	9.728	0.907	10	325	295	8	260	236	6	195	177
		G 1/4	13.157	1.337	10	240	321	8	195	261	6	145	194
		G 3/8	16.662	1.337	10	190	254	8	155	207	6	115	154
		G 1/2	20.955	1.814	10	150	272	8	120	218	6	90	163
	Stainless steel [Cr-Ni/1.4301] 	G 1/8	9.728	0.907	5	165	150	4	130	118	3	100	91
		G 1/4	13.157	1.337	5	120	160	4	95	127	3	75	100
		G 3/8	16.662	1.337	5	95	127	4	75	100	3	55	74
		G 1/2	20.955	1.814	5	75	136	4	60	109	3	45	82
	Stainless steel [Cr-Ni-Mo-.../1.4571] 	G 1/8	9.728	0.907	6	195	177	5	165	150	4	130	118
		G 1/4	13.157	1.337	6	145	194	5	120	160	4	95	127
		G 3/8	16.662	1.337	6	115	154	5	95	127	4	75	100
		G 1/2	20.955	1.814	6	90	163	5	75	136	4	60	109
	Heat resistant steel [17-4 PH] 	G 1/8	9.728	0.907	4	130	118	3	100	91	-	-	-
		G 1/4	13.157	1.337	4	95	127	3	75	100	-	-	-
		G 3/8	16.662	1.337	4	75	100	3	55	74	-	-	-
		G 1/2	20.955	1.814	4	60	109	3	45	82	-	-	-



A cross-sectional diagram of a butt joint. Two plates, each 10 mm thick, are joined by a square groove weld. The weld is a square groove weld with a depth of 10 mm. The plates are 10 mm thick. The weld is a square groove weld with a depth of 10 mm. The plates are 10 mm thick.



Form C



Rm
 < 850
HRC
 < 24

Rm
850-1100
HRC
24-34

Inox
Stainless

M
MF
G
UN
EG

[illegible]



Unified thread UNC

UNC, tolerance 2B

N° EK11670 / EK11671



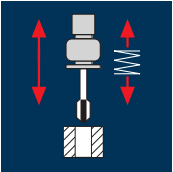
	HSS-E Co5		Rm 850-1100 HRC 24-34		293
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N° EK11680 / EK11681



	HSS-E Co5		Rm 850-1100 HRC 24-34		295
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- M
- MF
- G
- UN**
- EG

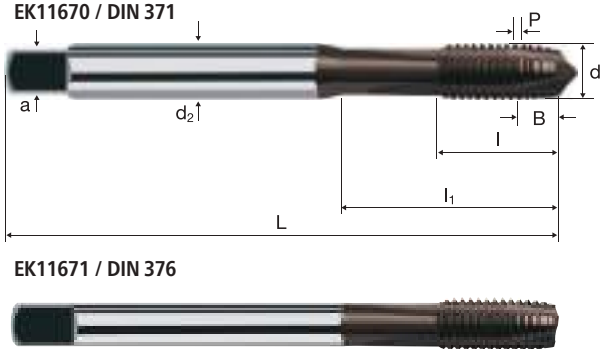
Application	Material	UNC	P(TPI)	d [mm]	P [mm]	v_c 1.5x d	n [min ⁻¹]	v_f [100%]	v_c 2.0x d	n [min ⁻¹]	v_f [100%]	v_c 3.0x d	n [min ⁻¹]	v_f [100%]	
	Steel 500 - 850 N/mm ² 	Nr.2	-56.0	2.184	0.454	20	2915	1323	16	2330	1058	12	1750	795	
		Nr.4	-40.0	2.845	0.635	20	2240	1422	16	1790	1137	12	1345	854	
		Nr.6	-32.0	3.505	0.794	20	1815	1441	16	1455	1155	12	1090	866	
		Nr.8	-32.0	4.166	0.794	20	1530	1215	16	1225	973	12	915	727	
		Nr.10	-24.0	4.826	1.058	20	1320	1397	16	1055	1116	12	790	836	
		Nr.12	-24.0	5.486	1.058	20	1160	1227	16	930	984	12	695	735	
		1/4	-20.0	6.350	1.270	20	1005	1276	16	800	1016	12	600	762	
		5/16	-18.0	7.938	1.411	20	800	1129	16	640	903	12	480	677	
		3/8	-16.0	9.525	1.588	20	670	1064	16	535	850	12	400	635	
		7/16	-14.0	11.113	1.814	20	575	1043	16	460	834	12	345	626	
		1/2	-13.0	12.700	1.954	20	500	977	16	400	782	12	300	586	
		9/16	-12.0	14.288	2.117	20	445	942	16	355	752	12	265	561	
		5/8	-11.0	15.875	2.309	20	400	924	16	320	739	12	240	554	
		3/4	-10.0	19.050	2.540	20	335	851	16	265	673	12	200	508	
		7/8	-9.0	22.225	2.822	20	285	804	16	230	649	12	170	480	
	Steel 500 - 850 N/mm ²														
		Nr.2	-56.0	2.184	0.454	16	2330	1058	12	1750	795	10	1455	661	
		Nr.4	-40.0	2.845	0.635	16	1790	1137	12	1345	854	10	1120	711	
		Nr.6	-32.0	3.505	0.794	16	1455	1155	12	1090	866	10	910	723	
		Nr.8	-32.0	4.166	0.794	16	1225	973	12	915	727	10	765	607	
		Nr.10	-24.0	4.826	1.058	16	1055	1116	12	790	836	10	660	698	
		Nr.12	-24.0	5.486	1.058	16	930	984	12	695	735	10	580	614	
		1/4	-20.0	6.350	1.270	16	800	1016	12	600	762	10	500	635	
		5/16	-18.0	7.938	1.411	16	640	903	12	480	677	10	400	564	
		3/8	-16.0	9.525	1.588	16	535	850	12	400	635	10	335	532	
		7/16	-14.0	11.113	1.814	16	460	834	12	345	626	10	285	517	
		1/2	-13.0	12.700	1.954	16	400	782	12	300	586	10	250	489	
		9/16	-12.0	14.288	2.117	16	355	752	12	265	561	10	225	476	
5/8	-11.0	15.875	2.309	16	320	739	12	240	554	10	200	462			
3/4	-10.0	19.050	2.540	16	265	673	12	200	508	10	165	419			
7/8	-9.0	22.225	2.822	16	230	649	12	170	480	10	145	409			
	Steel 850 - 1100 N/mm ²														
		Nr.2	-56.0	2.184	0.454	5	730	331	3	435	198	-	-	-	
		Nr.4	-40.0	2.845	0.635	5	560	356	3	335	213	-	-	-	
		Nr.6	-32.0	3.505	0.794	5	455	361	3	270	214	-	-	-	
		Nr.8	-32.0	4.166	0.794	5	380	302	3	230	183	-	-	-	
		Nr.10	-24.0	4.826	1.058	5	330	349	3	200	212	-	-	-	
		Nr.12	-24.0	5.486	1.058	5	290	307	3	175	185	-	-	-	
		1/4	-20.0	6.350	1.270	5	250	318	3	150	191	-	-	-	
		5/16	-18.0	7.938	1.411	5	200	282	3	120	169	-	-	-	
		3/8	-16.0	9.525	1.588	5	165	262	3	100	159	-	-	-	
		7/16	-14.0	11.113	1.814	5	145	263	3	85	154	-	-	-	
		1/2	-13.0	12.700	1.954	5	125	244	3	75	147	-	-	-	
		9/16	-12.0	14.288	2.117	5	110	233	3	65	138	-	-	-	
5/8	-11.0	15.875	2.309	5	100	231	3	60	139	-	-	-			
3/4	-10.0	19.050	2.540	5	85	216	3	50	127	-	-	-			
7/8	-9.0	22.225	2.822	5	70	198	3	45	127	-	-	-			
	Steel 1100 - 1300 N/mm ²														

UNC

2B

HSS-E
Co5

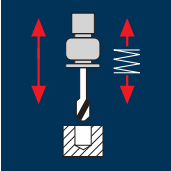
X - P
Form B



Rm <850 HRC <24	Rm 850-1100 HRC 24-34	Rm 1100-1300 HRC 34-42								
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Example: Order-N°.											Article-N°. α-Code		TiAlN	
											EK11670 701		EK11670	
Ø Code	d	P(TPI)	d (mm)	L	l	l ₁	d ₂	a						
701	Nr.2	-56.0	2.184	45	9.00	14.5	2.8	2.1	3	1.85			●	
703	Nr.4	-40.0	2.845	56	11.00	18.0	3.5	2.7	3	2.35			●	
705	Nr.6	-32.0	3.505	56	12.00	20.0	4.0	3.0	3	2.85			●	
706	Nr.8	-32.0	4.166	63	12.00	21.0	4.5	3.4	3	3.50			●	
707	Nr.10	-24.0	4.826	70	14.00	25.0	6.0	4.9	3	3.90			●	
708	Nr.12	-24.0	5.486	80	16.00	30.0	6.0	4.9	3	4.50			●	
709	1/4	-20.0	6.350	80	16.00	30.0	7.0	5.5	3	5.10			●	
710	5/16	-18.0	7.938	90	18.00	35.0	8.0	6.2	3	6.60			●	
711	3/8	-16.0	9.525	100	20.00	39.0	10.0	8.0	3	8.00			●	

Example: Order-N°.											Article-N°. α-Code		TiAlN	
											EK11671 712		EK11671	
Ø Code	d	P(TPI)	d (mm)	L	l	l ₁	d ₂	a						
712	7/16	-14.0	11.113	100	22.00	42.0	8.0	6.2	3	9.40			●	
713	1/2	-13.0	12.700	110	25.00	49.0	9.0	7.0	4	10.80			●	
714	9/16	-12.0	14.288	110	28.00	53.0	11.0	9.0	4	12.20			●	
715	5/8	-11.0	15.875	110	30.00	53.0	12.0	9.0	4	13.50			●	
716	3/4	-10.0	19.050	125	33.00	62.0	14.0	11.0	4	16.50			●	
717	7/8	-9.0	22.225	140	35.00	62.0	18.0	14.5	4	19.50			●	

Application	Material	UNC	P(TPI)	d [mm]	P [mm]	v_c 1.0 x d	n [min ⁻¹]	v_f [100%]	v_c 1.5 x d	n [min ⁻¹]	v_f [100%]	v_c 2.0 x d	n [min ⁻¹]	v_f [100%]
	Steel 500 - 850 N/mm ²	Nr.2	-56.0	2.184	0.454	25	3645	1655	22	3205	1455	18	2625	1192
		Nr.4	-40.0	2.845	0.635	25	2795	1775	22	2460	1562	18	2015	1280
		Nr.6	-32.0	3.505	0.794	25	2270	1802	22	2000	1588	18	1635	1298
		Nr.8	-32.0	4.166	0.794	25	1910	1517	22	1680	1334	18	1375	1092
		Nr.10	-24.0	4.826	1.058	25	1650	1746	22	1450	1534	18	1185	1254
		Nr.12	-24.0	5.486	1.058	25	1450	1534	22	1275	1349	18	1045	1106
		1/4	-20.0	6.350	1.270	25	1255	1594	22	1105	1403	18	900	1143
		5/16	-18.0	7.938	1.411	25	1000	1411	22	880	1242	18	720	1016
		3/8	-16.0	9.525	1.588	25	835	1326	22	735	1167	18	600	953
		7/16	-14.0	11.113	1.814	25	715	1297	22	630	1143	18	515	934
	Steel 500 - 850 N/mm ²	1/2	-13.0	12.700	1.954	25	625	1221	22	550	1075	18	450	879
		9/16	-12.0	14.288	2.117	25	555	1175	22	490	1037	18	400	847
		5/8	-11.0	15.875	2.309	25	500	1155	22	440	1016	18	360	831
		3/4	-10.0	19.050	2.540	25	420	1067	22	370	940	18	300	762
		7/8	-9.0	22.225	2.822	25	360	1016	22	315	889	18	260	734
	Steel 850 - 1100 N/mm ²	Nr.2	-56.0	2.184	0.454	16	2330	1058	13	1895	860	8	1165	529
		Nr.4	-40.0	2.845	0.635	16	1790	1137	13	1455	924	8	895	568
		Nr.6	-32.0	3.505	0.794	16	1455	1155	13	1180	937	8	725	576
		Nr.8	-32.0	4.166	0.794	16	1225	973	13	995	790	8	610	484
		Nr.10	-24.0	4.826	1.058	16	1055	1116	13	855	905	8	530	561
		Nr.12	-24.0	5.486	1.058	16	930	984	13	755	799	8	465	492
		1/4	-20.0	6.350	1.270	16	800	1016	13	650	826	8	400	508
		5/16	-18.0	7.938	1.411	16	640	903	13	520	734	8	320	452
		3/8	-16.0	9.525	1.588	16	535	850	13	435	691	8	265	421
		7/16	-14.0	11.113	1.814	16	460	834	13	370	671	8	230	417
	Steel 850 - 1100 N/mm ²	1/2	-13.0	12.700	1.954	16	400	782	13	325	635	8	200	391
		9/16	-12.0	14.288	2.117	16	355	752	13	290	614	8	180	381
		5/8	-11.0	15.875	2.309	16	320	739	13	260	600	8	160	369
		3/4	-10.0	19.050	2.540	16	265	673	13	215	546	8	135	343
		7/8	-9.0	22.225	2.822	16	230	649	13	185	522	8	115	325

UNC

2B



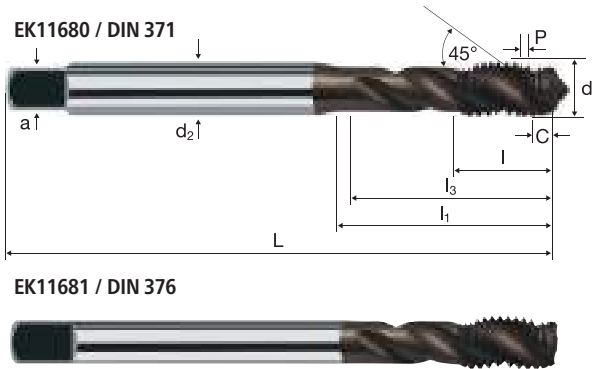
HSS-E
Co5







X - P
Form C



Rm
< 850
HRC
< 24

Rm
850-1100
HRC
24-34

M
MF
G
UN
EG

Example: Order-N°.												Article-N°. ø-Code		TiAlN	
												EK11680		EK11680	
Ø Code	d	P(TPI)	d (mm)	L	l	l ₁	l ₃	d ₂	a						
701	Nr.2	-56.0	2.184	45	5.00	14.5	12.5	2.8	2.1	3	1.85			●	
703	Nr.4	-40.0	2.845	56	7.00	18.0	14.0	3.5	2.7	3	2.35			●	
705	Nr.6	-32.0	3.505	56	8.00	20.0	16.0	4.0	3.0	3	2.85			●	
706	Nr.8	-32.0	4.166	63	8.00	21.0	17.0	4.5	3.4	3	3.50			●	
707	Nr.10	-24.0	4.826	70	11.00	25.0	21.0	6.0	4.9	3	3.90			●	
708	Nr.12	-24.0	5.486	80	11.00	30.0	26.0	6.0	4.9	3	4.50			●	
709	1/4	-20.0	6.350	80	13.00	30.0	26.0	7.0	5.5	3	5.10			●	
710	5/16	-18.0	7.938	90	14.00	35.0	31.0	8.0	6.2	3	6.60			●	
711	3/8	-16.0	9.525	100	16.00	39.0	35.0	10.0	8.0	3	8.00			●	

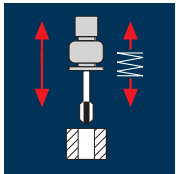
Example: Order-N°.												Article-N°. ø-Code		TiAlN	
												EK11681		EK11681	
Ø Code	d	P(TPI)	d (mm)	L	l	l ₁	l ₃	d ₂	a						
712	7/16	-14.0	11.113	100	18.00	42.0	38.0	8.0	6.2	3	9.40			●	
713	1/2	-13.0	12.700	110	20.00	49.0	45.0	9.0	7.0	3	10.80			●	
714	9/16	-12.0	14.288	110	21.00	53.0	49.0	11.0	9.0	3	12.20			●	
715	5/8	-11.0	15.875	110	24.00	53.0	49.0	12.0	9.0	4	13.50			●	
716	3/4	-10.0	19.050	125	25.00	62.0	58.0	14.0	11.0	4	16.50			●	
717	7/8	-9.0	22.225	140	28.00	62.0	58.0	18.0	14.5	4	19.50			●	



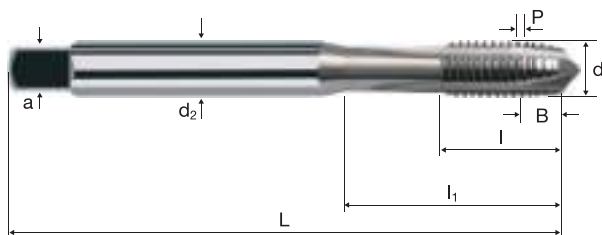
Metric coarse thread for inserts EG M

Tolerance 6H mod					
N° E11955			HSS-E Co5		Rm < 850 HRC < 24 Al Aluminium Alloy 299
N° E11965			HSS-E Co5		Rm < 850 HRC < 24 Al Aluminium Alloy 301

- M
- MF
- G
- UN
- EG

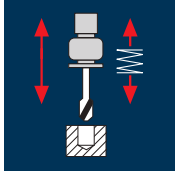
Application	Material	EG-M	d [mm]	P [mm]	v_c 1.5 x d	n [min ⁻¹]	v_f [100%]	v_c 2.0 x d	n [min ⁻¹]	v_f [100%]	v_c 3.0 x d	n [min ⁻¹]	v_f [100%]
	Steel < 500 N/mm ²	EGM 2	2.520	0.40	14	1770	708	12	1515	606	10	1265	506
		EGM 2.5	3.084	0.45	14	1445	650	12	1240	558	10	1030	464
		EGM 3	3.650	0.50	14	1220	610	12	1045	523	10	870	435
		EGM 4	4.910	0.70	14	910	637	12	780	546	10	650	455
		EGM 5	6.040	0.80	14	740	592	12	630	504	10	525	420
		EGM 6	7.300	1.00	14	610	610	12	525	525	10	435	435
		EGM 8	9.624	1.25	14	465	581	12	395	494	10	330	413
		EGM 10	11.948	1.50	14	375	563	12	320	480	10	265	398
		EGM 12	14.274	1.75	14	310	543	12	270	473	10	225	394
		EGM 14	16.598	2.00	14	270	540	12	230	460	10	190	380
	Steel < 500 N/mm ²	EGM 16	18.598	2.00	14	240	480	12	205	410	10	170	340
	Steel 500 - 850 N/mm ²	EGM 2	2.520	0.40	10	1265	506	8	1010	404	6	760	304
		EGM 2.5	3.084	0.45	10	1030	464	8	825	371	6	620	279
		EGM 3	3.650	0.50	10	870	435	8	700	350	6	525	263
		EGM 4	4.910	0.70	10	650	455	8	520	364	6	390	273
		EGM 5	6.040	0.80	10	525	420	8	420	336	6	315	252
		EGM 6	7.300	1.00	10	435	435	8	350	350	6	260	260
		EGM 8	9.624	1.25	10	330	413	8	265	331	6	200	250
		EGM 10	11.948	1.50	10	265	398	8	215	323	6	160	240
		EGM 12	14.274	1.75	10	225	394	8	180	315	6	135	236
		EGM 14	16.598	2.00	10	190	380	8	155	310	6	115	230
	Steel 500 - 850 N/mm ²	EGM 16	18.598	2.00	10	170	340	8	135	270	6	105	210
	Wrought aluminium alloys Si < 6% hardened	EGM 2	2.520	0.40	11	1390	556	9	1135	454	7	885	354
		EGM 2.5	3.084	0.45	11	1135	511	9	930	419	7	720	324
		EGM 3	3.650	0.50	11	960	480	9	785	393	7	610	305
		EGM 4	4.910	0.70	11	715	501	9	585	410	7	455	319
		EGM 5	6.040	0.80	11	580	464	9	475	380	7	370	296
		EGM 6	7.300	1.00	11	480	480	9	390	390	7	305	305
		EGM 8	9.624	1.25	11	365	456	9	300	375	7	230	288
		EGM 10	11.948	1.50	11	295	443	9	240	360	7	185	278
		EGM 12	14.274	1.75	11	245	429	9	200	350	7	155	271
		EGM 14	16.598	2.00	11	210	420	9	175	350	7	135	270
	Wrought aluminium alloys Si < 6% hardened	EGM 16	18.598	2.00	11	190	380	9	155	310	7	120	240
	Unalloyed copper	EGM 2	2.520	0.40	12	1515	606	10	1265	506	8	1010	404
		EGM 2.5	3.084	0.45	12	1240	558	10	1030	464	8	825	371
		EGM 3	3.650	0.50	12	1045	523	10	870	435	8	700	350
		EGM 4	4.910	0.70	12	780	546	10	650	455	8	520	364
		EGM 5	6.040	0.80	12	630	504	10	525	420	8	420	336
		EGM 6	7.300	1.00	12	525	525	10	435	435	8	350	350
		EGM 8	9.624	1.25	12	395	494	10	330	413	8	265	331
		EGM 10	11.948	1.50	12	320	480	10	265	398	8	215	323
		EGM 12	14.274	1.75	12	270	473	10	225	394	8	180	315
		EGM 14	16.598	2.00	12	230	460	10	190	380	8	155	310
	Unalloyed copper	EGM 16	18.598	2.00	12	205	410	10	170	340	8	135	270

6H
mod



GG(G)

[illegible]

Application	Material	EG-M	d [mm]	P [mm]	v_c 1.0 x d	n [min ⁻¹]	v_f [100%]	v_c 1.5 x d	n [min ⁻¹]	v_f [100%]	v_c 2.0 x d	n [min ⁻¹]	v_f [100%]
	Steel < 500 N/mm ²	EGM 2	2.520	0.40	11	1390	556	10	1265	506	8	1010	404
		EGM 2.5	3.084	0.45	11	1135	511	10	1030	464	8	825	371
		EGM 3	3.650	0.50	11	960	480	10	870	435	8	700	350
		EGM 4	4.910	0.70	11	715	501	10	650	455	8	520	364
		EGM 5	6.040	0.80	11	580	464	10	525	420	8	420	336
		EGM 6	7.300	1.00	11	480	480	10	435	435	8	350	350
		EGM 8	9.624	1.25	11	365	456	10	330	413	8	265	331
		EGM 10	11.948	1.50	11	295	443	10	265	398	8	215	323
		EGM 12	14.274	1.75	11	245	429	10	225	394	8	180	315
		EGM 14	16.598	2.00	11	210	420	10	190	380	8	155	310
	Steel < 500 N/mm ²	EGM 16	18.598	2.00	11	190	380	10	170	340	8	135	270
	Steel 500 - 850 N/mm ²	EGM 2	2.520	0.40	8	1010	404	7	885	354	6	760	304
		EGM 2.5	3.084	0.45	8	825	371	7	720	324	6	620	279
		EGM 3	3.650	0.50	8	700	350	7	610	305	6	525	263
		EGM 4	4.910	0.70	8	520	364	7	455	319	6	390	273
		EGM 5	6.040	0.80	8	420	336	7	370	296	6	315	252
		EGM 6	7.300	1.00	8	350	350	7	305	305	6	260	260
		EGM 8	9.624	1.25	8	265	331	7	230	288	6	200	250
		EGM 10	11.948	1.50	8	215	323	7	185	278	6	160	240
		EGM 12	14.274	1.75	8	180	315	7	155	271	6	135	236
		EGM 14	16.598	2.00	8	155	310	7	135	270	6	115	230
	Steel 500 - 850 N/mm ²	EGM 16	18.598	2.00	8	135	270	7	120	240	6	105	210
	Wrought aluminium alloys Si < 6% hardened	EGM 2	2.520	0.40	7	885	354	6	760	304	6	760	304
		EGM 2.5	3.084	0.45	7	720	324	6	620	279	6	620	279
		EGM 3	3.650	0.50	7	610	305	6	525	263	6	525	263
		EGM 4	4.910	0.70	7	455	319	6	390	273	6	390	273
		EGM 5	6.040	0.80	7	370	296	6	315	252	6	315	252
		EGM 6	7.300	1.00	7	305	305	6	260	260	6	260	260
		EGM 8	9.624	1.25	7	230	288	6	200	250	6	200	250
		EGM 10	11.948	1.50	7	185	278	6	160	240	6	160	240
		EGM 12	14.274	1.75	7	155	271	6	135	236	6	135	236
		EGM 14	16.598	2.00	7	135	270	6	115	230	6	115	230
	Wrought aluminium alloys Si < 6% hardened	EGM 16	18.598	2.00	7	120	240	6	105	210	6	105	210
	Unalloyed copper	EGM 2	2.520	0.40	10	1265	506	9	1135	454	8	1010	404
		EGM 2.5	3.084	0.45	10	1030	464	9	930	419	8	825	371
		EGM 3	3.650	0.50	10	870	435	9	785	393	8	700	350
		EGM 4	4.910	0.70	10	650	455	9	585	410	8	520	364
		EGM 5	6.040	0.80	10	525	420	9	475	380	8	420	336
		EGM 6	7.300	1.00	10	435	435	9	390	390	8	350	350
		EGM 8	9.624	1.25	10	330	413	9	300	375	8	265	331
		EGM 10	11.948	1.50	10	265	398	9	240	360	8	215	323
		EGM 12	14.274	1.75	10	225	394	9	200	350	8	180	315
		EGM 14	16.598	2.00	10	190	380	9	175	350	8	155	310
	Unalloyed copper	EGM 16	18.598	2.00	10	170	340	9	155	310	8	135	270

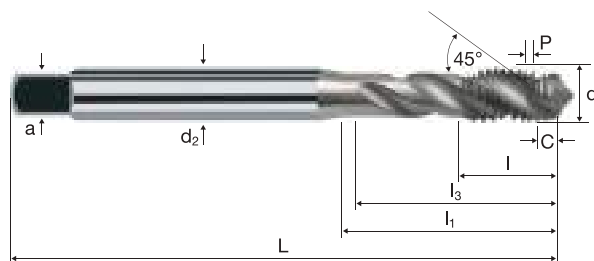
6H
mod



HSS-E
Co5



Form C



Rm
<850
HRC
<24

Al
Aluminium
> 99%

Al
Aluminium
Alloy

Al
Aluminium
Cast

Cu
Copper

Plastic Thermoplast

GG(G)

M
MF
G
UN
EG

[illegible]



Cold forming taps _M

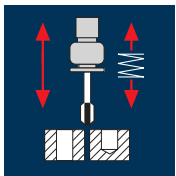
Tolerance ISO 2 (6H)

N° EF10060 / EF10061		duroform		HSS PM/F		Al Aluminium Alloy	Cu Copper	305
N° EH6100 / EH6101				HM MG10		Rm < 850-1100 HRC < 24-34	Al Aluminium Alloy	309
N° EL10080 / EL10081		Lightform Steel		HSS PM/F		Rm < 850 HRC < 24		311
N° EH10070 / EH10071				HSS PM/F		Rm < 850 HRC < 24		315

Tolerance ISO 3 (6G)

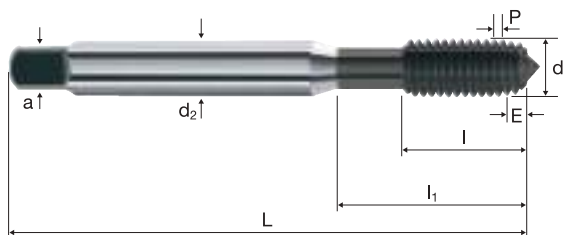
N° EH10040 / EH10041			HSS-E Co5		Rm < 850 HRC < 24		319
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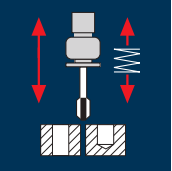
CF

Application	Material	M	d [mm]	P [mm]	v_c 1.5 x d	n [min ⁻¹]	v_f [100%]	v_c 2.0 x d	n [min ⁻¹]	v_f [100%]	v_c 3.0 x d	n [min ⁻¹]	v_f [100%]
	Unalloyed aluminium	M 1	1.000	0.25	25	7960	1990	20	6365	1591	15	4775	1194
		M 1.2	1.200	0.25	25	6630	1658	20	5305	1326	15	3980	995
		M 1.4	1.400	0.30	25	5685	1706	20	4545	1364	15	3410	1023
		M 1.6	1.600	0.35	25	4975	1741	20	3980	1393	15	2985	1045
		M 1.8	1.800	0.35	25	4420	1547	20	3535	1237	15	2655	929
		M 2	2.000	0.40	25	3980	1592	20	3185	1274	15	2385	954
		M 2.2	2.200	0.45	25	3615	1627	20	2895	1303	15	2170	977
		M 2.5	2.500	0.45	25	3185	1433	20	2545	1145	15	1910	860
		M 3	3.000	0.50	25	2655	1328	20	2120	1060	15	1590	795
		M 4	4.000	0.70	25	1990	1393	20	1590	1113	15	1195	837
Unalloyed aluminium		M 5	5.000	0.80	25	1590	1272	20	1275	1020	15	955	764
		M 6	6.000	1.00	25	1325	1325	20	1060	1060	15	795	795
		M 8	8.000	1.25	25	995	1244	20	795	994	15	595	744
		M 10	10.000	1.50	25	795	1193	20	635	953	15	475	713
Wrought aluminium alloys Si < 6% not hardened		M 1	1.000	0.25	30	9550	2388	25	7960	1990	20	6365	1591
		M 1.2	1.200	0.25	30	7960	1990	25	6630	1658	20	5305	1326
		M 1.4	1.400	0.30	30	6820	2046	25	5685	1706	20	4545	1364
		M 1.6	1.600	0.35	30	5970	2090	25	4975	1741	20	3980	1393
		M 1.8	1.800	0.35	30	5305	1857	25	4420	1547	20	3535	1237
		M 2	2.000	0.40	30	4775	1910	25	3980	1592	20	3185	1274
		M 2.2	2.200	0.45	30	4340	1953	25	3615	1627	20	2895	1303
		M 2.5	2.500	0.45	30	3820	1719	25	3185	1433	20	2545	1145
		M 3	3.000	0.50	30	3185	1593	25	2655	1328	20	2120	1060
		M 4	4.000	0.70	30	2385	1670	25	1990	1393	20	1590	1113
Wrought aluminium alloys Si < 6% not hardened		M 5	5.000	0.80	30	1910	1528	25	1590	1272	20	1275	1020
		M 6	6.000	1.00	30	1590	1590	25	1325	1325	20	1060	1060
		M 8	8.000	1.25	30	1195	1494	25	995	1244	20	795	994
		M 10	10.000	1.50	30	955	1433	25	795	1193	20	635	953
Unalloyed copper		M 1	1.000	0.25	15	4775	1194	10	3185	796	10	3185	796
		M 1.2	1.200	0.25	15	3980	995	10	2655	664	10	2655	664
		M 1.4	1.400	0.30	15	3410	1023	10	2275	683	10	2275	683
		M 1.6	1.600	0.35	15	2985	1045	10	1990	697	10	1990	697
		M 1.8	1.800	0.35	15	2655	929	10	1770	620	10	1770	620
		M 2	2.000	0.40	15	2385	954	10	1590	636	10	1590	636
		M 2.2	2.200	0.45	15	2170	977	10	1445	650	10	1445	650
		M 2.5	2.500	0.45	15	1910	860	10	1275	574	10	1275	574
		M 3	3.000	0.50	15	1590	795	10	1060	530	10	1060	530
		M 4	4.000	0.70	15	1195	837	10	795	557	10	795	557
Unalloyed copper		M 5	5.000	0.80	15	955	764	10	635	508	10	635	508
		M 6	6.000	1.00	15	795	795	10	530	530	10	530	530
		M 8	8.000	1.25	15	595	744	10	400	500	10	400	500
		M 10	10.000	1.50	15	475	713	10	320	480	10	320	480
Non ferrous metal A ₅ > 15%		M 1	1.000	0.25	15	4775	1194	10	3185	796	10	3185	796
		M 1.2	1.200	0.25	15	3980	995	10	2655	664	10	2655	664
		M 1.4	1.400	0.30	15	3410	1023	10	2275	683	10	2275	683
		M 1.6	1.600	0.35	15	2985	1045	10	1990	697	10	1990	697
		M 1.8	1.800	0.35	15	2655	929	10	1770	620	10	1770	620
		M 2	2.000	0.40	15	2385	954	10	1590	636	10	1590	636
		M 2.2	2.200	0.45	15	2170	977	10	1445	650	10	1445	650
		M 2.5	2.500	0.45	15	1910	860	10	1275	574	10	1275	574
		M 3	3.000	0.50	15	1590	795	10	1060	530	10	1060	530
		M 4	4.000	0.70	15	1195	837	10	795	557	10	795	557
Non ferrous metal A ₅ > 15%		M 5	5.000	0.80	15	955	764	10	635	508	10	635	508
		M 6	6.000	1.00	15	795	795	10	530	530	10	530	530
		M 8	8.000	1.25	15	595	744	10	400	500	10	400	500
		M 10	10.000	1.50	15	475	713	10	320	480	10	320	480

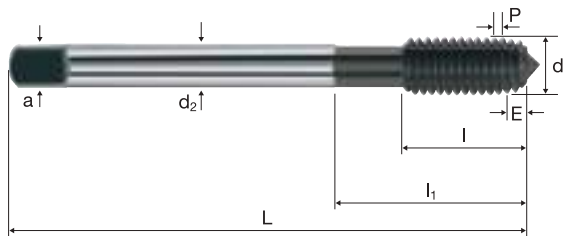
AI

ISO 2
(6H)

CF

Application	Material	M	d [mm]	P [mm]	v_c 1.5 x d	n [min ⁻¹]	v_f [100%]	v_c 2.0 x d	n [min ⁻¹]	v_f [100%]	v_c 3.0 x d	n [min ⁻¹]	v_f [100%]
	Unalloyed aluminium	M 12	12.000	1.75	25	665	1164	20	530	928	15	400	700
		M 14	14.000	2.00	25	570	1140	20	455	910	15	340	680
		M 16	16.000	2.00	25	495	990	20	400	800	15	300	600
Wrought aluminium alloys Si < 6% not hardened 		M 12	12.000	1.75	30	795	1391	25	665	1164	20	530	928
		M 14	14.000	2.00	30	680	1360	25	570	1140	20	455	910
		M 16	16.000	2.00	30	595	1190	25	495	990	20	400	800
Unalloyed copper		M 12	12.000	1.75	15	400	700	10	265	464	10	265	464
		M 14	14.000	2.00	15	340	680	10	225	450	10	225	450
		M 16	16.000	2.00	15	300	600	10	200	400	10	200	400
Non ferrous metal A _s > 15% 		M 12	12.000	1.75	15	400	700	10	265	464	10	265	464
		M 14	14.000	2.00	15	340	680	10	225	450	10	225	450
		M 16	16.000	2.00	15	300	600	10	200	400	10	200	400

ISO 2
(6H)



Al
Aluminium
> 99%

Al
Aluminium
Alloy

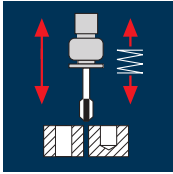
Cu
Copper

CuZn Brass

[illegible]

CF

Application



Material

Steel
 $< 850 \text{ N/mm}^2$
 $A_s > 10\%$



Steel
 $850 - 1100 \text{ N/mm}^2$
 $A_s > 10\%$



Unalloyed aluminium



Wrought aluminium
 alloys
 $\text{Si} < 6\%$
 not hardened



Unalloyed copper



Non ferrous metal
 $A_s > 15\%$



Stainless steel
 ferritic/martensitic
 $A_s > 10\%$



Stainless steel
 [Cr-Ni/1.4301]



M	d [mm]	P [mm]	v_c 1.0 x d			v_c 1.5 x d			v_c 2.0 x d		
			n [min ⁻¹]	v_f [100%]		n [min ⁻¹]	v_f [100%]		n [min ⁻¹]	v_f [100%]	
M 3	3.000	0.50	35	3715	1858	30	3185	1593	25	2655	1328
M 4	4.000	0.70	35	2785	1950	30	2385	1670	25	1990	1393
M 5	5.000	0.80	35	2230	1784	30	1910	1528	25	1590	1272
M 6	6.000	1.00	35	1855	1855	30	1590	1590	25	1325	1325
M 8	8.000	1.25	35	1395	1744	30	1195	1494	25	995	1244
M 10	10.000	1.50	35	1115	1673	30	955	1433	25	795	1193
M 12	12.000	1.75	35	930	1628	30	795	1391	25	665	1164
M 3	3.000	0.50	30	3185	1593	25	2655	1328	20	2120	1060
M 4	4.000	0.70	30	2385	1670	25	1990	1393	20	1590	1113
M 5	5.000	0.80	30	1910	1528	25	1590	1272	20	1275	1020
M 6	6.000	1.00	30	1590	1590	25	1325	1325	20	1060	1060
M 8	8.000	1.25	30	1195	1494	25	995	1244	20	795	994
M 10	10.000	1.50	30	955	1433	25	795	1193	20	635	953
M 12	12.000	1.75	30	795	1391	25	665	1164	20	530	928
M 3	3.000	0.50	50	5305	2653	40	4245	2123	30	3185	1593
M 4	4.000	0.70	50	3980	2786	40	3185	2230	30	2385	1670
M 5	5.000	0.80	50	3185	2548	40	2545	2036	30	1910	1528
M 6	6.000	1.00	50	2655	2655	40	2120	2120	30	1590	1590
M 8	8.000	1.25	50	1990	2488	40	1590	1988	30	1195	1494
M 10	10.000	1.50	50	1590	2385	40	1275	1913	30	955	1433
M 12	12.000	1.75	50	1325	2319	40	1060	1855	30	795	1391
M 3	3.000	0.50	80	8490	4245	60	6365	3183	40	4245	2123
M 4	4.000	0.70	80	6365	4456	60	4775	3343	40	3185	2230
M 5	5.000	0.80	80	5095	4076	60	3820	3056	40	2545	2036
M 6	6.000	1.00	80	4245	4245	60	3185	3185	40	2120	2120
M 8	8.000	1.25	80	3185	3981	60	2385	2981	40	1590	1988
M 10	10.000	1.50	80	2545	3818	60	1910	2865	40	1275	1913
M 12	12.000	1.75	80	2120	3710	60	1590	2783	40	1060	1855
M 3	3.000	0.50	60	6365	3183	40	4245	2123	30	3185	1593
M 4	4.000	0.70	60	4775	3343	40	3185	2230	30	2385	1670
M 5	5.000	0.80	60	3820	3056	40	2545	2036	30	1910	1528
M 6	6.000	1.00	60	3185	3185	40	2120	2120	30	1590	1590
M 8	8.000	1.25	60	2385	2981	40	1590	1988	30	1195	1494
M 10	10.000	1.50	60	1910	2865	40	1275	1913	30	955	1433
M 12	12.000	1.75	60	1590	2783	40	1060	1855	30	795	1391
M 3	3.000	0.50	50	5305	2653	30	3185	1593	25	2655	1328
M 4	4.000	0.70	50	3980	2786	30	2385	1670	25	1990	1393
M 5	5.000	0.80	50	3185	2548	30	1910	1528	25	1590	1272
M 6	6.000	1.00	50	2655	2655	30	1590	1590	25	1325	1325
M 8	8.000	1.25	50	1990	2488	30	1195	1494	25	995	1244
M 10	10.000	1.50	50	1590	2385	30	955	1433	25	795	1193
M 12	12.000	1.75	50	1325	2319	30	795	1391	25	665	1164
M 3	3.000	0.50	30	3185	1593	25	2655	1328	20	2120	1060
M 4	4.000	0.70	30	2385	1670	25	1990	1393	20	1590	1113
M 5	5.000	0.80	30	1910	1528	25	1590	1272	20	1275	1020
M 6	6.000	1.00	30	1590	1590	25	1325	1325	20	1060	1060
M 8	8.000	1.25	30	1195	1494	25	995	1244	20	795	994
M 10	10.000	1.50	30	955	1433	25	795	1193	20	635	953
M 12	12.000	1.75	30	795	1391	25	665	1164	20	530	928
M 3	3.000	0.50	30	3185	1593	25	2655	1328	20	2120	1060
M 4	4.000	0.70	30	2385	1670	25	1990	1393	20	1590	1113
M 5	5.000	0.80	30	1910	1528	25	1590	1272	20	1275	1020
M 6	6.000	1.00	30	1590	1590	25	1325	1325	20	1060	1060
M 8	8.000	1.25	30	1195	1494	25	995	1244	20	795	994
M 10	10.000	1.50	30	955	1433	25	795	1193	20	635	953
M 12	12.000	1.75	30	795	1391	25	665	1164	20	530	928

Cold forming taps duroform

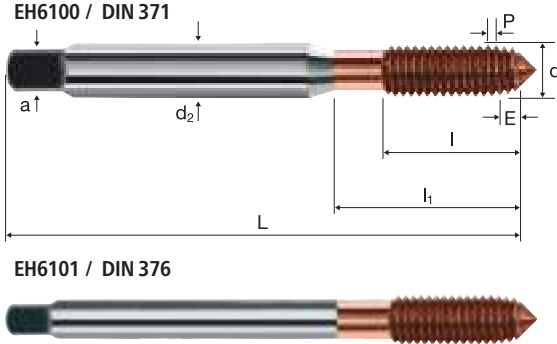


M

ISO 2
(6H)

HM
MG10

Form E



Rm
<850
HRC
<24

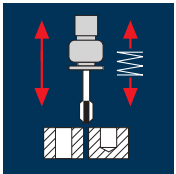
Rm
850-1100
HRC
24-34

Inox
Stainless

Aluminium
Copper

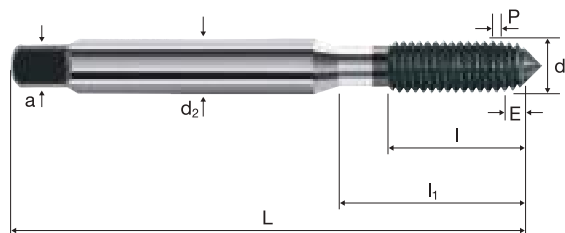
Example: Order-N°.										Article-N°.		a-Code						AICrTiN	
										EH6100		044						EH6100	
Ø Code	d	P	L	l	l ₁	d ₂	a												
044	M 3	0.50	56	12.00	18.0	3.5	2.7	3	2.80									●	
058	M 4	0.70	63	13.00	21.0	4.5	3.4	4	3.70									●	
084	M 5	0.80	70	15.00	25.0	6.0	4.9	4	4.60									●	
088	M 6	1.00	80	17.00	30.0	6.0	4.9	4	5.50									●	
160	M 8	1.25	90	20.00	35.0	8.0	6.2	5	7.40									●	
174	M 10	1.50	100	22.00	39.0	10.0	8.0	5	9.30									●	

Example: Order-N°.										Article-N°.		a-Code						AICrTiN	
										EH6101		240						EH6101	
Ø Code	d	P	L	l	l ₁	d ₂	a												
240	M 12	1.75	110	24.00	50.0	9.0	7.0	7	11.20									●	

Application	Material	M	d [mm]	P [mm]	v_c 1.5x d	n [min ⁻¹]	v_f [100%]	v_c 2.0x d	n [min ⁻¹]	v_f [100%]	v_c 3.0x d	n [min ⁻¹]	v_f [100%]
	Steel < 850 N/mm ² A _s > 10% 	M 1	1.000	0.25	20	6365	1591	15	4775	1194	10	3185	796
		M 1.2	1.200	0.25	20	5305	1326	15	3980	995	10	2655	664
		M 1.4	1.400	0.30	20	4545	1364	15	3410	1023	10	2275	683
		M 1.6	1.600	0.35	20	3980	1393	15	2985	1045	10	1990	697
		M 1.8	1.800	0.35	20	3535	1237	15	2655	929	10	1770	620
		M 2	2.000	0.40	20	3185	1274	15	2385	954	10	1590	636
		M 2.2	2.200	0.45	20	2895	1303	15	2170	977	10	1445	650
		M 2.5	2.500	0.45	20	2545	1145	15	1910	860	10	1275	574
		M 3	3.000	0.50	20	2120	1060	15	1590	795	10	1060	530
Steel < 850 N/mm ² A _s > 10% 	M 4	4.000	0.70	20	1590	1113	15	1195	837	10	795	557	
	M 5	5.000	0.80	20	1275	1020	15	955	764	10	635	508	
	M 6	6.000	1.00	20	1060	1060	15	795	795	10	530	530	
	M 8	8.000	1.25	20	795	994	15	595	744	10	400	500	
	M 10	10.000	1.50	20	635	953	15	475	713	10	320	480	
Steel 850 - 1100 N/mm ² A _s > 10% 	M 1	1.000	0.25	15	4775	1194	10	3185	796	-	-	-	
	M 1.2	1.200	0.25	15	3980	995	10	2655	664	-	-	-	
	M 1.4	1.400	0.30	15	3410	1023	10	2275	683	-	-	-	
	M 1.6	1.600	0.35	15	2985	1045	10	1990	697	-	-	-	
	M 1.8	1.800	0.35	15	2655	929	10	1770	620	-	-	-	
	M 2	2.000	0.40	15	2385	954	10	1590	636	-	-	-	
	M 2.2	2.200	0.45	15	2170	977	10	1445	650	-	-	-	
	M 2.5	2.500	0.45	15	1910	860	10	1275	574	-	-	-	
	M 3	3.000	0.50	15	1590	795	10	1060	530	-	-	-	
Steel 850 - 1100 N/mm ² A _s > 10% 	M 4	4.000	0.70	15	1195	837	10	795	557	-	-	-	
	M 5	5.000	0.80	15	955	764	10	635	508	-	-	-	
	M 6	6.000	1.00	15	795	795	10	530	530	-	-	-	
	M 8	8.000	1.25	15	595	744	10	400	500	-	-	-	
	M 10	10.000	1.50	15	475	713	10	320	480	-	-	-	
Stainless steel ferritic/martensitic A _s > 10% 	M 1	1.000	0.25	15	4775	1194	10	3185	796	-	-	-	
	M 1.2	1.200	0.25	15	3980	995	10	2655	664	-	-	-	
	M 1.4	1.400	0.30	15	3410	1023	10	2275	683	-	-	-	
	M 1.6	1.600	0.35	15	2985	1045	10	1990	697	-	-	-	
	M 1.8	1.800	0.35	15	2655	929	10	1770	620	-	-	-	
	M 2	2.000	0.40	15	2385	954	10	1590	636	-	-	-	
	M 2.2	2.200	0.45	15	2170	977	10	1445	650	-	-	-	
	M 2.5	2.500	0.45	15	1910	860	10	1275	574	-	-	-	
	M 3	3.000	0.50	15	1590	795	10	1060	530	-	-	-	
Stainless steel ferritic/martensitic A _s > 10% 	M 4	4.000	0.70	15	1195	837	10	795	557	-	-	-	
	M 5	5.000	0.80	15	955	764	10	635	508	-	-	-	
	M 6	6.000	1.00	15	795	795	10	530	530	-	-	-	
	M 8	8.000	1.25	15	595	744	10	400	500	-	-	-	
	M 10	10.000	1.50	15	475	713	10	320	480	-	-	-	
Stainless steel [Cr-Ni/1.4301] 	M 1	1.000	0.25	15	4775	1194	10	3185	796	-	-	-	
	M 1.2	1.200	0.25	15	3980	995	10	2655	664	-	-	-	
	M 1.4	1.400	0.30	15	3410	1023	10	2275	683	-	-	-	
	M1.6	1.600	0.35	15	2985	1045	10	1990	697	-	-	-	
	M 1.8	1.800	0.35	15	2655	929	10	1770	620	-	-	-	
	M 2	2.000	0.40	15	2385	954	10	1590	636	-	-	-	
	M 2.2	2.200	0.45	15	2170	977	10	1445	650	-	-	-	
	M 2.5	2.500	0.45	15	1910	860	10	1275	574	-	-	-	
	M 3	3.000	0.50	15	1590	795	10	1060	530	-	-	-	
Stainless steel [Cr-Ni/1.4301] 	M 4	4.000	0.70	15	1195	837	10	795	557	-	-	-	
	M 5	5.000	0.80	15	955	764	10	635	508	-	-	-	
	M 6	6.000	1.00	15	795	795	10	530	530	-	-	-	
	M 8	8.000	1.25	15	595	744	10	400	500	-	-	-	
	M 10	10.000	1.50	15	475	713	10	320	480	-	-	-	

St

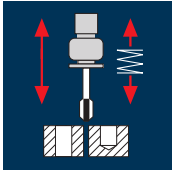
ISO 2
(6H)



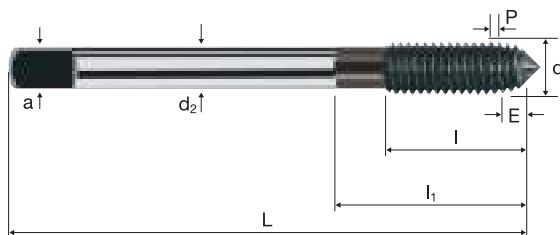
Rm
850-1100
HRC
24-34

Inox Stainless

CF

Application	Material												
	Steel < 850 N/mm ² A _s > 10%	M 12	12.000	1.75	20	530	928	15	400	700	10	265	464
		M 14	14.000	2.00	20	455	910	15	340	680	10	225	450
		M 16	16.000	2.00	20	400	800	15	300	600	10	200	400
	Steel 850 - 1100 N/mm ² A _s > 10%	M 12	12.000	1.75	15	400	700	10	265	464	-	-	-
		M 14	14.000	2.00	15	340	680	10	225	450	-	-	-
		M 16	16.000	2.00	15	300	600	10	200	400	-	-	-
	Stainless steel ferritic/martensitic A _s > 10%	M 12	12.000	1.75	15	400	700	10	265	464	-	-	-
		M 14	14.000	2.00	15	340	680	10	225	450	-	-	-
		M 16	16.000	2.00	15	300	600	10	200	400	-	-	-
	Stainless steel [Cr-Ni/1.4301]	M 12	12.000	1.75	15	400	700	10	265	464	-	-	-
		M 14	14.000	2.00	15	340	680	10	225	450	-	-	-
		M 16	16.000	2.00	15	300	600	10	200	400	-	-	-
													

ISO 2
(6H)



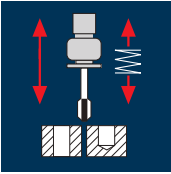
Rm
850-1100
HRC
24-34

Inox Stainless

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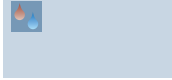
CF

Application

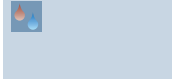


Material

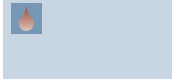
Steel
 $< 850 \text{ N/mm}^2$
 $A_5 > 10\%$



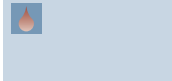
Steel
 $< 850 \text{ N/mm}^2$
 $A_5 > 10\%$



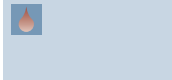
Steel
850 - 1100 N/mm²
A₅ > 10%



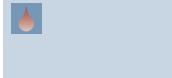
Steel
850 - 1100 N/mm²
A₅ > 10%



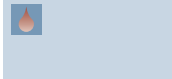
Stainless steel
ferritic/martensitic
 $A_5 > 10\%$



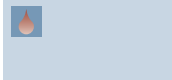
Stainless steel
ferritic/martensitic
 $A_5 > 10\%$



Stainless steel
[Cr-Ni/1.4301]



Stainless steel
[Cr-Ni/1.4301]

A small, stylized icon of a stainless steel component, possibly a nozzle or a small pipe fitting, with a blue and grey color scheme.

M	d [mm]	P [mm]	v _c 1.5×d	n [min ⁻¹]	v _f [100%]	v _c 2.0×d	n [min ⁻¹]	v _f [100%]	v _c 3.0×d	n [min ⁻¹]	v _f [100%]
M 1	1.000	0.25	20	6365	1591	15	4775	1194	10	3185	796
M 1.2	1.200	0.25	20	5305	1326	15	3980	995	10	2655	664
M 1.4	1.400	0.30	20	4545	1364	15	3410	1023	10	2275	683
M 1.6	1.600	0.35	20	3980	1393	15	2985	1045	10	1990	697
M 1.8	1.800	0.35	20	3535	1237	15	2655	929	10	1770	620
M 2	2.000	0.40	20	3185	1274	15	2385	954	10	1590	636
M 2.2	2.200	0.45	20	2895	1303	15	2170	977	10	1445	650
M 2.5	2.500	0.45	20	2545	1145	15	1910	860	10	1275	574
M 3	3.000	0.50	20	2120	1060	15	1590	795	10	1060	530
M 4	4.000	0.70	20	1590	1113	15	1195	837	10	795	557
M 5	5.000	0.80	20	1275	1020	15	955	764	10	635	508
M 6	6.000	1.00	20	1060	1060	15	795	795	10	530	530
M 8	8.000	1.25	20	795	994	15	595	744	10	400	500
M 10	10.000	1.50	20	635	953	15	475	713	10	320	480
M 1	1.000	0.25	15	4775	1194	10	3185	796	-	-	-
M 1.2	1.200	0.25	15	3980	995	10	2655	664	-	-	-
M 1.4	1.400	0.30	15	3410	1023	10	2275	683	-	-	-
M 1.6	1.600	0.35	15	2985	1045	10	1990	697	-	-	-
M 1.8	1.800	0.35	15	2655	929	10	1770	620	-	-	-
M 2	2.000	0.40	15	2385	954	10	1590	636	-	-	-
M 2.2	2.200	0.45	15	2170	977	10	1445	650	-	-	-
M 2.5	2.500	0.45	15	1910	860	10	1275	574	-	-	-
M 3	3.000	0.50	15	1590	795	10	1060	530	-	-	-
M 4	4.000	0.70	15	1195	837	10	795	557	-	-	-
M 5	5.000	0.80	15	955	764	10	635	508	-	-	-
M 6	6.000	1.00	15	795	795	10	530	530	-	-	-
M 8	8.000	1.25	15	595	744	10	400	500	-	-	-
M 10	10.000	1.50	15	475	713	10	320	480	-	-	-
M 1	1.000	0.25	15	4775	1194	10	3185	796	-	-	-
M 1.2	1.200	0.25	15	3980	995	10	2655	664	-	-	-
M 1.4	1.400	0.30	15	3410	1023	10	2275	683	-	-	-
M 1.6	1.600	0.35	15	2985	1045	10	1990	697	-	-	-
M 1.8	1.800	0.35	15	2655	929	10	1770	620	-	-	-
M 2	2.000	0.40	15	2385	954	10	1590	636	-	-	-
M 2.2	2.200	0.45	15	2170	977	10	1445	650	-	-	-
M 2.5	2.500	0.45	15	1910	860	10	1275	574	-	-	-
M 3	3.000	0.50	15	1590	795	10	1060	530	-	-	-
M 4	4.000	0.70	15	1195	837	10	795	557	-	-	-
M 5	5.000	0.80	15	955	764	10	635	508	-	-	-
M 6	6.000	1.00	15	795	795	10	530	530	-	-	-
M 8	8.000	1.25	15	595	744	10	400	500	-	-	-
M 10	10.000	1.50	15	475	713	10	320	480	-	-	-
M 1	1.000	0.25	15	4775	1194	10	3185	796	-	-	-
M 1.2	1.200	0.25	15	3980	995	10	2655	664	-	-	-
M 1.4	1.400	0.30	15	3410	1023	10	2275	683	-	-	-
M 1.6	1.600	0.35	15	2985	1045	10	1990	697	-	-	-
M 1.8	1.800	0.35	15	2655	929	10	1770	620	-	-	-
M 2	2.000	0.40	15	2385	954	10	1590	636	-	-	-
M 2.2	2.200	0.45	15	2170	977	10	1445	650	-	-	-
M 2.5	2.500	0.45	15	1910	860	10	1275	574	-	-	-
M 3	3.000	0.50	15	1590	795	10	1060	530	-	-	-
M 4	4.000	0.70	15	1195	837	10	795	557	-	-	-
M 5	5.000	0.80	15	955	764	10	635	508	-	-	-
M 6	6.000	1.00	15	795	795	10	530	530	-	-	-
M 8	8.000	1.25	15	595	744	10	400	500	-	-	-
M 10	10.000	1.50	15	475	713	10	320	480	-	-	-

Cold forming taps

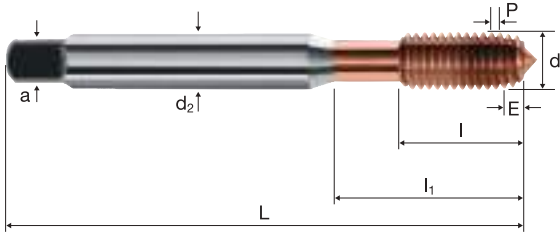


M

ISO 2
(6H)

HSS
PM/F

Form E

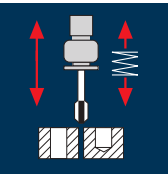


Rm
<850
HRC
<24

Rm
850-1100
HRC
24-34

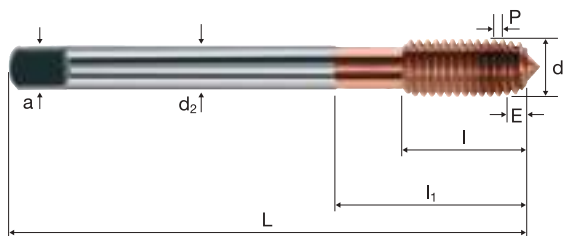
Inox
Stainless

Example: Order-N°. Article-N°. EH10070 ø-Code 010										AlCrTiN	
										EH10070	
Ø Code	d	P	L	I	I ₁	d ₂	a				
010*	M 1	0.25	40	5.50	-	2.5	2.1	3	0.87		●
012*	M 1.2	0.25	40	5.50	-	2.5	2.1	3	1.07		●
020*	M 1.4	0.30	40	7.00	-	2.5	2.1	3	1.25		●
022*	M 1.6	0.35	40	8.00	-	2.5	2.1	3	1.42		●
026*	M 1.8	0.35	40	8.00	-	2.5	2.1	3	1.62		●
034	M 2	0.40	45	8.00	-	2.8	2.1	3	1.80		●
036	M 2.2	0.45	45	9.00	-	2.8	2.1	3	2.00		●
040	M 2.5	0.45	50	9.00	-	2.8	2.1	3	2.30		●
044	M 3	0.50	56	12.00	18.0	3.5	2.7	3	2.80		●
058	M 4	0.70	63	13.00	21.0	4.5	3.4	4	3.70		●
084	M 5	0.80	70	15.00	25.0	6.0	4.9	4	4.60		●
088	M 6	1.00	80	17.00	30.0	6.0	4.9	4	5.50		●
160	M 8	1.25	90	20.00	35.0	8.0	6.2	5	7.40		●
174	M 10	1.50	100	22.00	39.0	10.0	8.0	5	9.30		●
	</										

Application	Material												
	Steel < 850 N/mm ² A _s > 10% 	M 12	12.000	1.75	20	530	928	15	400	700	10	265	464
		M 14	14.000	2.00	20	455	910	15	340	680	10	225	450
		M 16	16.000	2.00	20	400	800	15	300	600	10	200	400
	Steel 850 - 1100 N/mm ² A _s > 10% 	M 12	12.000	1.75	15	400	700	10	265	464	-	-	-
		M 14	14.000	2.00	15	340	680	10	225	450	-	-	-
		M 16	16.000	2.00	15	300	600	10	200	400	-	-	-
	Stainless steel ferritic/martensitic A _s > 10% 	M 12	12.000	1.75	15	400	700	10	265	464	-	-	-
		M 14	14.000	2.00	15	340	680	10	225	450	-	-	-
		M 16	16.000	2.00	15	300	600	10	200	400	-	-	-
	Stainless steel [Cr-Ni/1.4301] 	M 12	12.000	1.75	15	400	700	10	265	464	-	-	-
		M 14	14.000	2.00	15	340	680	10	225	450	-	-	-
		M 16	16.000	2.00	15	300	600	10	200	400	-	-	-

St

ISO 2
(6H)



Rm
850-1100
HRC
24-34

Inox
Stainless

CF

Application	Material	M	d [mm]	P [mm]	v_c 1.5x d	n [min ⁻¹]	v_f [100%]	v_c 2.0x d	n [min ⁻¹]	v_f [100%]	v_c 3.0x d	n [min ⁻¹]	v_f [100%]	
	Steel < 850 N/mm ² A _s > 10%	M 2	2.000	0.40	20	3185	1274	15	2385	954	10	1590	636	
		M 2.5	2.500	0.45	20	2545	1145	15	1910	860	10	1275	574	
		M 3	3.000	0.50	20	2120	1060	15	1590	795	10	1060	530	
		M 4	4.000	0.70	20	1590	1113	15	1195	837	10	795	557	
		M 5	5.000	0.80	20	1275	1020	15	955	764	10	635	508	
		M 6	6.000	1.00	20	1060	1060	15	795	795	10	530	530	
		M 8	8.000	1.25	20	795	994	15	595	744	10	400	500	
		M 10	10.000	1.50	20	635	953	15	475	713	10	320	480	
		M 12	12.000	1.75	20	530	928	15	400	700	10	265	464	
		M 14	14.000	2.00	20	455	910	15	340	680	10	225	450	
		M 16	16.000	2.00	20	400	800	15	300	600	10	200	400	
	Steel < 850 N/mm ² A _s > 10%													
	Steel 850 - 1100 N/mm ² A _s > 10%	M 2	2.000	0.40	15	2385	954	10	1590	636	-	-	-	
		M 2.5	2.500	0.45	15	1910	860	10	1275	574	-	-	-	
		M 3	3.000	0.50	15	1590	795	10	1060	530	-	-	-	
		M 4	4.000	0.70	15	1195	837	10	795	557	-	-	-	
		M 5	5.000	0.80	15	955	764	10	635	508	-	-	-	
		M 6	6.000	1.00	15	795	795	10	530	530	-	-	-	
		M 8	8.000	1.25	15	595	744	10	400	500	-	-	-	
		M 10	10.000	1.50	15	475	713	10	320	480	-	-	-	
		M 12	12.000	1.75	15	400	700	10	265	464	-	-	-	
		M 14	14.000	2.00	15	340	680	10	225	450	-	-	-	
		M 16	16.000	2.00	15	300	600	10	200	400	-	-	-	
	Steel 850 - 1100 N/mm ² A _s > 10%													
	Stainless steel ferritic/martensitic A _s > 10%	M 2	2.000	0.40	15	2385	954	10	1590	636	-	-	-	
		M 2.5	2.500	0.45	15	1910	860	10	1275	574	-	-	-	
		M 3	3.000	0.50	15	1590	795	10	1060	530	-	-	-	
		M 4	4.000	0.70	15	1195	837	10	795	557	-	-	-	
		M 5	5.000	0.80	15	955	764	10	635	508	-	-	-	
		M 6	6.000	1.00	15	795	795	10	530	530	-	-	-	
		M 8	8.000	1.25	15	595	744	10	400	500	-	-	-	
		M 10	10.000	1.50	15	475	713	10	320	480	-	-	-	
		M 12	12.000	1.75	15	400	700	10	265	464	-	-	-	
		M 14	14.000	2.00	15	340	680	10	225	450	-	-	-	
		M 16	16.000	2.00	15	300	600	10	200	400	-	-	-	
	Stainless steel ferritic/martensitic A _s > 10%													
	Stainless steel [Cr-Ni/1.4301]	M 2	2.000	0.40	15	2385	954	10	1590	636	-	-	-	
		M 2.5	2.500	0.45	15	1910	860	10	1275	574	-	-	-	
		M 3	3.000	0.50	15	1590	795	10	1060	530	-	-	-	
		M 4	4.000	0.70	15	1195	837	10	795	557	-	-	-	
		M 5	5.000	0.80	15	955	764	10	635	508	-	-	-	
		M 6	6.000	1.00	15	795	795	10	530	530	-	-	-	
		M 8	8.000	1.25	15	595	744	10	400	500	-	-	-	
		M 10	10.000	1.50	15	475	713	10	320	480	-	-	-	
		M 12	12.000	1.75	15	400	700	10	265	464	-	-	-	
		M 14	14.000	2.00	15	340	680	10	225	450	-	-	-	
		M 16	16.000	2.00	15	300	600	10	200	400	-	-	-	
	Stainless steel [Cr-Ni/1.4301]													

Cold forming taps

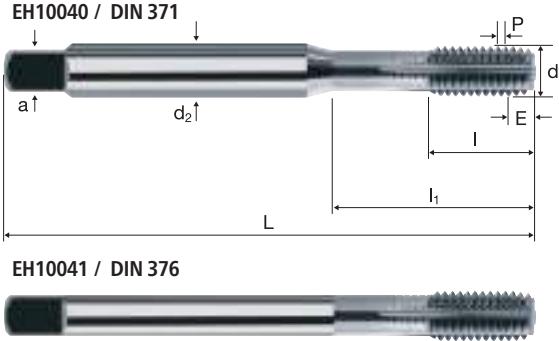


M

ISO 3
(6G)

HSS
PM/F

Form E



Rm <850
HRC <24

Rm 850-1100
HRC 24-34

Inox
Stainless

Example: Order-N°.										Article-N°.		α-Code										TiCN
																						EH10040
Ø Code	d	P	L	l	l ₁	d ₂	a															
034	M 2	0.40	45	8.00	13.5	2.8	2.1	4	1.80													●
040	M 2.5	0.45	50	9.00	14.5	2.8	2.1	4	2.30													●
044	M 3	0.50	56	10.00	18.0	3.5	2.7	4	2.80													●
058	M 4	0.70	63	12.00	21.0	4.5	3.4	4	3.70													●
084	M 5	0.80	70	14.00	25.0	6.0	4.9	5	4.60													●
088	M 6	1.00	80	16.00	30.0	6.0	4.9	5	5.50													●
160	M 8	1.25	90	17.00	35.0	8.0	6.2	5	7.40													●
174	M 10	1.50	100	20.00	39.0	10.0	8.0	5	9.30													●

Example: Order-N°.										Article-N°.		α-Code										TiCN
																						EH10041
Ø Code	d	P	L	l	l ₁	d ₂	a															
240	M 12	1.75	110	24.00	49.0	9.0	7.0	7	11.20													●
244	M 14	2.00	110	26.00	53.0	11.0	9.0	7	13.10													●
246	M 16	2.00	110	26.00	54.0	12.0	9.0	8	15.10													●



ToolSchool recommends

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Drilling tool information

324 – 329

Thread cutting tool information

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General information

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ToolSchool – Recommendation



FRAISA offers you highly innovative products; products that are always state-of-the-art and right at the cutting edge of technological development.

For this reason, we would like to use our **“ToolSchool Recommendation”** concept to draw your attention to the latest technologies now incorporated in our product catalog and, of course, to the advantages they bring.

Our **“ToolSchool Recommendation”** clearly demonstrates how you can and should switch from the products you have been using until now to the new cutting-edge products from FRAISA. The  logo has been used in this catalog to highlight selected products that offer a particularly good opportunity to upgrade from an existing tool to the latest technology.

By switching from “old” to “new”, you benefit from increased productivity, cost reductions and genuine competitive advantages in the marketplace.

With our ToolSchool concept, you can be sure you always have the very latest technology to hand. This will strengthen your position in comparison to all your competitors.

FRAISA’s ToolSchool stands for longstanding, field-proven experience and expertise. ToolSchool stands for application know-how and customer value. You can count on that.

Latest FRAISA technology for:

- **Greater efficiency**
- **Lower costs**
- **Improved competitiveness**

Existing technology		Latest technology	
Article	Page	Article	Page
B62015 / B63015	35	B82005 / B83005 Supradrill®	19

Legend to the product page of drilling tools

Tool technologies



Drilling tools with four chamfers (Two friction and two guide lands)

- Improved straightness of the hole
- Improved hole quality and alignment
- Less deviation of the hole when drilling through cross holes
- Precise holes with good surface and maximum support of the tool upon exit



Drilling tool with optimised polished flutes and internal cooling

- Reduction of friction and therefore less adhesion, improved chip formation and lower heat generation



Drilling tool with optimised polished flutes, without internal cooling

- Reduction of friction and therefore less adhesion, improved chip formation and lower heat generation



Drilling tool with shank of h5 tolerance

- High concentricity and roundness
- Optimal for modern precision chucks



Tool with special edge conditioning

- Conditioning of the main cutting edge for increased stability
- Increase the mechanical and thermal load on the cutting edge
- General increase in the tool life

Cutting tool substrate material

**HM
XA**

Fine grain carbide. Hardness 1950 HV. Co content 8%. Characterised by a particularly high level of abrasion resistance.

**HM
MGX**

High-performance fine grain carbide with ultrafine tungsten carbides. Hardness 1610 HV. Co content 10%.

**HM
MG10**

Fine grain carbide. Hardness 1600 HV. Co content 10%.

**HM
MGD²**

Fine grain carbide with high bending and shear strength combined with good elasticity.

HM

Universal fine grain carbide.

HSS

High-performance substrate material, conventionally melted HSS alloy.

Legend to the product page of drilling tools

Internal cooling



Drills with internal cooling show improved chip formation and better chip removal which in turn results in an improved tool life.



Drills without internal cooling.

Point angle and helix angle



The point angle influences decisively the spectrum of materials that can be drilled. Further, small point angles bring a better centering behaviour; large point angles reduce the torque.



The helix angle influences decisively the rake angle on the major cutting edge (drill point) of the drill. Therefore, large helix angles are used for soft materials, small helix angles for hard and brittle materials.

Versions and dimensions of spiral flute drills

Spiral flute drills carbide, 3xd

The dimensions of this tool correspond to DIN 6537 K «Spiral flute drills carbide with offset cylindrical shank».

Spiral flute drills carbide, 5xd

The dimensions of this tool correspond to DIN 6537 L «Spiral flute drills carbide with offset cylindrical shank».

Spiral flute drills carbide and deep hole drills carbide, greater than 5xd

According to company standard.

Spiral flute drills carbide 8xd, optimised

According to company standard, but with optimised l/d ratio for optimum tool stability.

Special versions and dimensions

90°

Indication of the point angle for center drills or counterbores.
Counterbores 90° to DIN 335.

Drilling depths

Indication of the nominal drilling depth. (Example: 5xd: five times drill diameter).

The nominal drilling depth does not correspond to the maximum depth! The maximum drilling depth is specified under L_{max} .

Legend to the product page of drilling tools

Shape of the shank / Shank versions

-  Full carbide tools with a cylindrical shank: shank version in accordance with DIN 6535 HA
-  Full carbide tools with a cylindrical shank and a side clamping surface. Shank version in accordance with DIN 6535 HB
-  Carbide Micro drills and Deep hole drills with cylindrical shank: Shank design to company standard.

Application suitability

-  A blue background means that the tool is particularly suitable for this material.
-  A light blue background means that the tool has good to adequate suitability for this material.

Rm < 850 HRC < 24	Rm 850-1100 HRC 24-34	Rm 1100-1300 HRC 34-42	Rm 1300-1500 HRC 42-48	HRC 48-56	HRC 56-60	HRC > 60	Inox Stainless	Ti Titanium	
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Additional material which can be machined is stated in the additional field 

Abbreviations

- d_1 Diameter of the cutting edge [mm]
- d_2 Diameter of the shank [mm]
- d_3 Face-surface diameter on rose countersinks [mm]
- l_1 Total length of the tool [mm]
- l_2 Length of the chip groove [mm]
- l_3 Length of the 2nd step (Step drills) [mm]
- l_4 Length of the shank [mm]
- L_{max} Maximum drilling depth of the tool
- L_k Drill depth for chamfered edge (Step drills)

Technical notes regarding use of drilling tools

Lubrication and coolant pressure

Basically, when drilling work with lubricant. The goal is more efficient chip removal and heat reduction. Hardened steel or abrasive materials can be cooled by using air or treated with MQL (minimal quantity lubrication).

If the coolant is applied externally, ensure the correct positioning of the coolant jet. This should be in the flute (directed parallel to the helix angle) and the entrance to the hole.

The use of internal cooling (internal coolant supply) can increase tool life. It is necessary, depending on the tool diameter, to apply a minimum coolant pressure.

The following table provides a guideline for the recommended FRAISA coolant pressure for IKZ drills:

Required coolant pressure for spiral fl ute drills with internal coolant emulsion						
Versions	< ø 3 mm	ø 3-5 mm	ø 5-8 mm	ø 8-12 mm	ø 12-16 mm	ø 16-20 mm
up to 5xd	60 bar	50 bar	30 bar	25 bar	20 bar	15 bar
8xd – 30xd	80 bar	60 bar	40 bar	30 bar	25 bar	20 bar
Required coolant pressure for spiral flute drills with internal coolant/MQL (minimal quantity lubrication)						
Versions	< ø 3 mm	ø 3-5 mm	ø 5-8 mm	ø 8-12 mm	ø 12-16 mm	ø 16-20 mm
up to 5xd	12 bar	10 bar	9 bar	8 bar	8 bar	7 bar
8xd – 30xd	14 bar	12 bar	10 bar	9 bar	9 bar	8 bar

Concentricity

The concentricity of the drilling process is an important process influencing variable. The eccentricity should be as small as possible, as this greatly influences the development of tool wear. The rotation should be controlled especially for hole diameters less than 6 mm. The control measurement is made when the drilling tool is in the clamped condition and in the machine spindle.

The following table provides a guideline from FRAISA for the recommended maximum eccentricity:

Maximum eccentricity of spiral flute drills						
Diameter range	< ø 1 mm	ø 1-3 mm	ø 3-6 mm	ø 6-10 mm	ø 10-16 mm	ø 16-20 mm
Maximum eccentricity	3 µm	5 µm	10 µm	15 µm	20 µm	25 µm

Centering and pilot hole

Drilling tools must always be set at right angles to the workpiece. If drilling is required on an inclined surface, an additional machining operation may be necessary to align the workpiece surface at a right angle to the drilling tool.

The point angle of the center drill should always be larger than the point angle of the subsequent spiral flute drill. Thus, an optimum centering of the drill and lower development of tool wear is achieved.

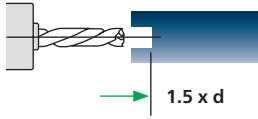
The following recommendation is from FRAISA for centering and pilot holes:

Versions	Cutting material	Recommendation
up to 5xd	HM	No
up to 5xd	HSS	Yes
8xd	HM	Optional. An improvement of positional accuracy can be achieved by centering.
12xd – 30xd	HM	Yes, a pilot hole is required (see page «Technical notes regarding use of deep hole drills»)

Technical notes regarding use of deep hole drills

FRAISA SA recommends the following drilling strategy to increase both service life and reliability:

Step 1

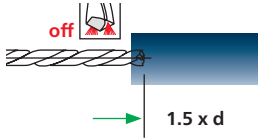


Pilot hole = $1.5 \times d$.

e.g. Supradrill® U 3xd. B62011.

The pilot hole must be free of chips prior to insertion of the deep-hole drill!

Step 2

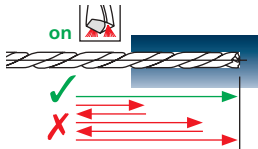


Insert the tool into the hole at max. 300 1/min

and $v_f = 1000 \text{ mm/min}$.

Without cooling up to 1 mm from the bottom of the pilot hole.

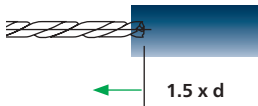
Step 3



Coolant supply on.

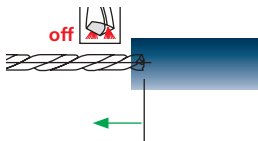
Drill using recommended cutting data and without chip breaking. When drilling **through-holes**, reduce the feed rate by at least 25% before retracting from the hole.

Step 4



Retract the deep-hole drill with double the feed rate ($= 2 \times v_f$) – until $1.5 \times d$ after entering the hole. Position as stated in Step 2.

Step 5



Next reduce the spindle speed to max. 300 1/min.

Coolant feed is switched off.

Withdraw the drill from the drilled hole. (max. 1000 mm/min).

SAFETY NOTE

Outside of the drill hole, long deep-hole drills may only turn at a low speed (max. 300 1/min).

Higher spindle speeds can cause such tools to vibrate, leading to spontaneous failure.

Calculation formulas for cutting data

d₁	Diameter of the cutting edge [mm]
v_c	Cutting speed [m/min]
f	Feed per rotation [mm]
n	Spindle speed [min ⁻¹]
v_f	Feed rate [mm/min]
Q	Material removal rate [cm ³ /min]
T	Primary processing time for the maximum drill depth of the tool [sec]
L	Effective drill depth [mm]

Spindle speed	$n = \frac{v_c \cdot 1000}{d_1 \cdot \pi} \left[\frac{1}{\text{min}} \right]$
---------------	--

Cutting speed	$v_c = \frac{d_1 \cdot n \cdot \pi}{1000} \left[\frac{\text{m}}{\text{min}} \right]$
---------------	---

Feed rate	$v_f = f \cdot n \left[\frac{\text{mm}}{\text{min}} \right]$
-----------	---

Material removal rate	$Q = \frac{d_1^2 \cdot \pi \cdot v_f}{4 \cdot 1000} \left[\frac{\text{cm}^3}{\text{min}} \right]$
-----------------------	--

Primary processing time	$T = \frac{L}{v_f} \cdot 60 \left[\text{sec} \right]$
-------------------------	--

Thread cutting tool material codes

Taps



P

Steel 850 - 1100 N/mm²
Stainless steel

08

Steel < 850 N/mm²

11

Steel 850 - 1100 N/mm²

15

Steel 1100 - 1500 N/mm²

60

Hardened tool steel 48 - 60 HRC

In

Stainless steel

GG

Cast iron (lamellar/spheroidal)

Al

Aluminium

Ti

Titanium alloys

Ni

Nickel base alloys prec.-hardness

R

Universal Rigid

U

Universal

Cold forming taps



St

Steel

Al

Aluminium

U

Universal

Legend to the product page of thread cutting tools

Thread types

M	Metric coarse thread according to ISO DIN 965 (DIN 13)
MF	Metric fine thread according to ISO DIN 965 (DIN 13)
MJ	MJ thread for aerospace use according to DIN ISO 5855
G	Whitworth pipe thread according to DIN ISO 228
UNC	Unified coarse thread according to ASME B1.1
UNF	Unified fine thread according to ASME B1.1
NPT	Conical american coarse thread according to ANSI B1.20.1
NPTF	Conical american coarse thread according to ANSI B1.20.3
EG M	Metric coarse thread for inserts according to DIN 8140-2

Legend to the product page of thread cutting tools

Application classes / Tolerance positions

ISO 2 (6H)	Tools of application class 2 (ISO 2) are designed for the production of threads with the tolerance fields 4G, 5G, 6H.
ISO 1 (4H)	Tools of application class 1 (ISO 1) are designed for the production of threads with the tolerance fields 4H, 5H.
ISO 3 (6G)	Tools of application class 3 (ISO 3) are designed for the production of threads with the tolerance fields 6G, 7H, 8H.
7G	Tools of application class 7G are preventively designed for the production of threads with the tolerance fields 7G, 8G, where subsequent heat treatment may cause dimensional distortions.
ISO 2 +0,1	Tools of application class 2 (ISO 2) are designed for the production of threads with the tolerance fields 4G, 5G, 6H. For threads which will get a galvanic coating of 0.025 mm thickness the tools are designed with an increased thread tolerance of 0.1 mm.
4H	Tools of application class 4H are designed for the production of threads MJ with the tolerance field 4H (ASME B1.1).
2B	Tools of application 2B are designed for the production of threads with the tolerance field 2B.
6H mod	Tools of application 6H are designed for the production of threads for inserts.

Cutting tool substrate material

HSS PM/F	High-performance cutting tool substrate material, powder metallurgically produced HSS alloys.
HSS-E Co5	High-performance substrate material, conventionally melted HSS alloy. Co-content 5%.
HM MG10	Universal fine-grain carbide. Hardness 1600 HV. Co-content 10%.
HM	Universal fine-grain carbide.

Legend to the product page of thread cutting tools

Thread norm



The teeth profiles of the tool correspond to the specified norm (see «Thread types»).

Form of the shanks



Cylindrical shank execution according to the specified tool norms.



Cylindrical shank execution with flat according to the specified tool norms.



Cylindrical shank execution with square end according to the specified tool norms.



Cylindrical shank execution with square end similar to the specified tool norms.



Cylindrical shank execution with square end according to the specified tool norms.



Cylindrical shank execution with square end.

Bore forms

The thread core bore must have the correct diameter.
(General rule for threading: bore diameter = thread diameter - pitch)



The tool is suitable for the fabrication of blind hole threads.



The tool is suitable for the fabrication of through hole threads.



The tool is suitable for the fabrication of blind hole and through hole threads.



The tool is suitable for the production of conical through and blind hole threads.

Legend to the product page of thread cutting tools

Chamfer forms / Lead-in cone forms



Chamfer form for taps according to DIN 2197, table 4, type B.
The pitch number in the chamfer is between 3.5 and 5.



Chamfer form for taps according to DIN 2197, table 4, type C.
The pitch number in the chamfer is between 2 and 3.
Lead-in cone form for thread former according to DIN 2175, table 4: type C.
The length of the lead-in cone is between 2 to 3 times the pitch.



Lead-in cone form for thread former according to DIN 2175, table 4: type E.
The length of the lead-in cone is at most double the pitch.

Chip flow



Tool with chip flow in feed direction.



Tool with chip flow against the feed direction.



Tool for short chipping work piece materials.

Cold forming taps



Tool with polygon profile without lubrication grooves.



Tool with polygon profile with lubrication grooves.

Thread milling cutters



The tool is suitable for the fabrication of internal threads.



The tool is suitable for the fabrication of external threads.

Legend to the product page of thread cutting tools

Application suitability



A blue background means that the tool is particularly suitable for this material.



A light blue background means that the tool has good to adequate suitability for this material.



Additional material which can be machined is stated in the additional field

Cooling lubricants

For the process of thread cutting and in particular for thread forming a good lubrication is essential. Especially for deeper threads proper lubrication is very important.



Best results for threading can be achieved by using oil (lubrication effect). The machining with an emulsion of at least 5% is also possible.



Wet machining



Dry machining



Oil must be used as lubricant.

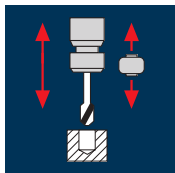


Oil with special additives must be used as lubricant.



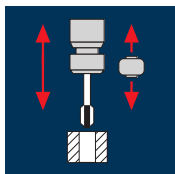
Choose diameter of the drill hole according to column critical material (see page «Core hole drill sizes»).

Technical notes regarding use of thread cutting tools



Thread cutting with micro-compensation or rigid tapping

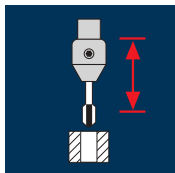
Modern CNC machine tools can synchronize the spindle speed and feed rate. Despite this, microscopic pitch errors can arise. These are compensated by micro-compensation or synchronous tapping attachments and facilitate better results in terms of tool life and quality.



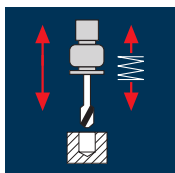
Rigid Tapping

Rigid tapping is designed for modern machines with synchronised spindle drives. All tools have a clamping flat and are used with conventional chucks.

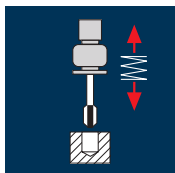
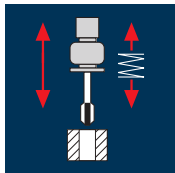
When using Rigid tapping, a sufficient approach distance must be programmed. If the distance is too small, the machine spindle may not be able to properly synchronize with the feed before entering the drillhole. This will result in a pitch error of the thread, even with synchronous working.



For some machines, it is possible that the recommended spindle speed for synchronous operation cannot be reached. In these cases it is necessary to operate at the highest possible spindle speed where synchronism of the machine is still guaranteed.



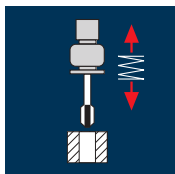
Thread cutting with functional performance of the compensation chuck or Rigid Tapping



Thread cutting with functional performance of the compensation chuck

A satisfactory compensation function of the chuck must be guaranteed (no jamming). Otherwise, despite the chuck, the thread may be miscut or pitch errors can arise. The torque level of the compensation chuck must be selected according to the thread type and the work piece material.

Programming of a too high RPM value can lead to problems. If a RPM is selected which cannot be reached (due to the inertia of the spindle), the result may be premature breakage of the tool or miscutting of the thread. A careful analysis often shows that high spindle speeds do not lead to overall significant time savings.



Technical notes regarding use of thread cutting tools



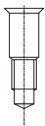
Hardness increase during drilling

For drilling, care has to be taken to ensure that a sharp, intact drill is used. If the wear is already too great, there is a risk that hardening of the periphery will occur during drilling. One result of this hardening may be the tap breaking.



Age or precipitation hardening and upsetting the countersink

When preparing for tapping, quality tools should be used which are adapted to the material. If the counterbore is too worn, the countersink will harden or be upset. This means the tap will encounter problems as soon as it starts to cut. This can lead to breakage right at the beginning. The countersink is important in guiding the tap.



Deeper threads

For deep threads, tools must be chosen with sufficiently long flutes. There is otherwise a risk of tool breakage due to chip build-up, because the chips cannot flow out of the hole. With Rigid Tapping, pecking in several steps can be programmed, in order to shorten the chips. Sufficient cooling is important.



Functional performance of the compensation chuck

A satisfactory compensation function of the chuck must be guaranteed (no jamming). Otherwise, despite the chuck, the thread may be miscut or pitch errors can arise. The torque level of the compensation chuck must be selected according to the thread diameter.



Correctly adjusted coolant jet

A specifically aimed coolant jet is important in tapping work. The direction should be from above, in the direction of the flutes, so that the cooling is also effective at depth. If the coolant jet is not aimed, the problem of heat development in the drillhole arises, with the risk of cold welding-together of the material, which in turn may lead to reduced service life and poor chip formation.



Safety clearance

When using Rigid Tapping, a sufficient approach distance must be programmed. If the clearance is too small, the problem arises of the machine spindle not synchronising with the feed before entering the drillhole. This results in pitch error of the thread, even with synchronous working.



Suitability of the machine

On a number of machines, there is a possibility that the recommended RPM cannot be applied. In this case, the RPM of the machine should be programmed accordingly.

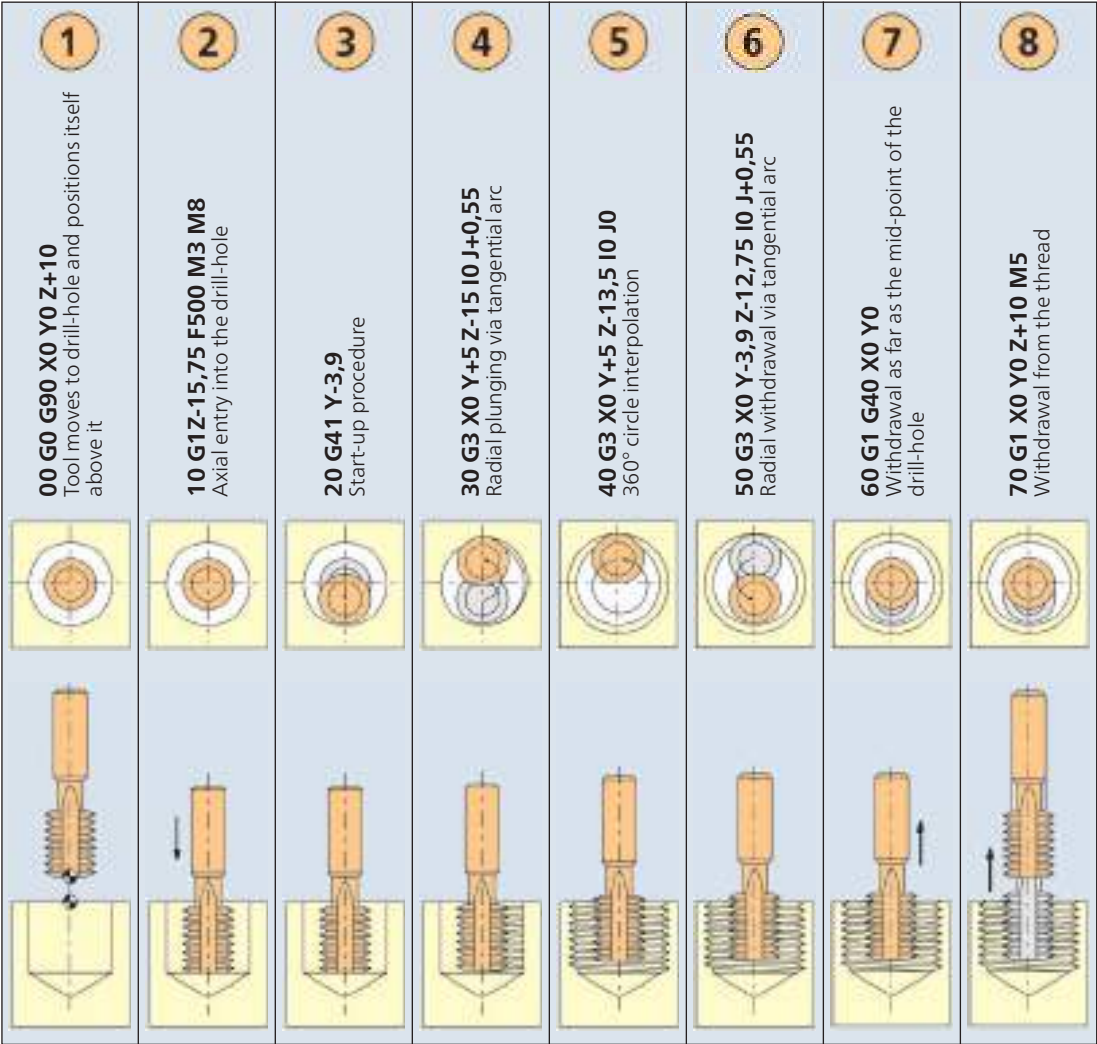


Inconstant RPM

Programming too high RPM can lead to problems: if a RPM is selected which cannot be achieved (due to the inertia of the machine), the result may be premature breakage of the tool or miscutting of the thread. If observed closely, it may often be seen that a high RPM does not in fact produce the time saving which was intended.

Technical notes regarding use of thread milling cutters

Thread milling cycle for M10 in ISO-code as an example

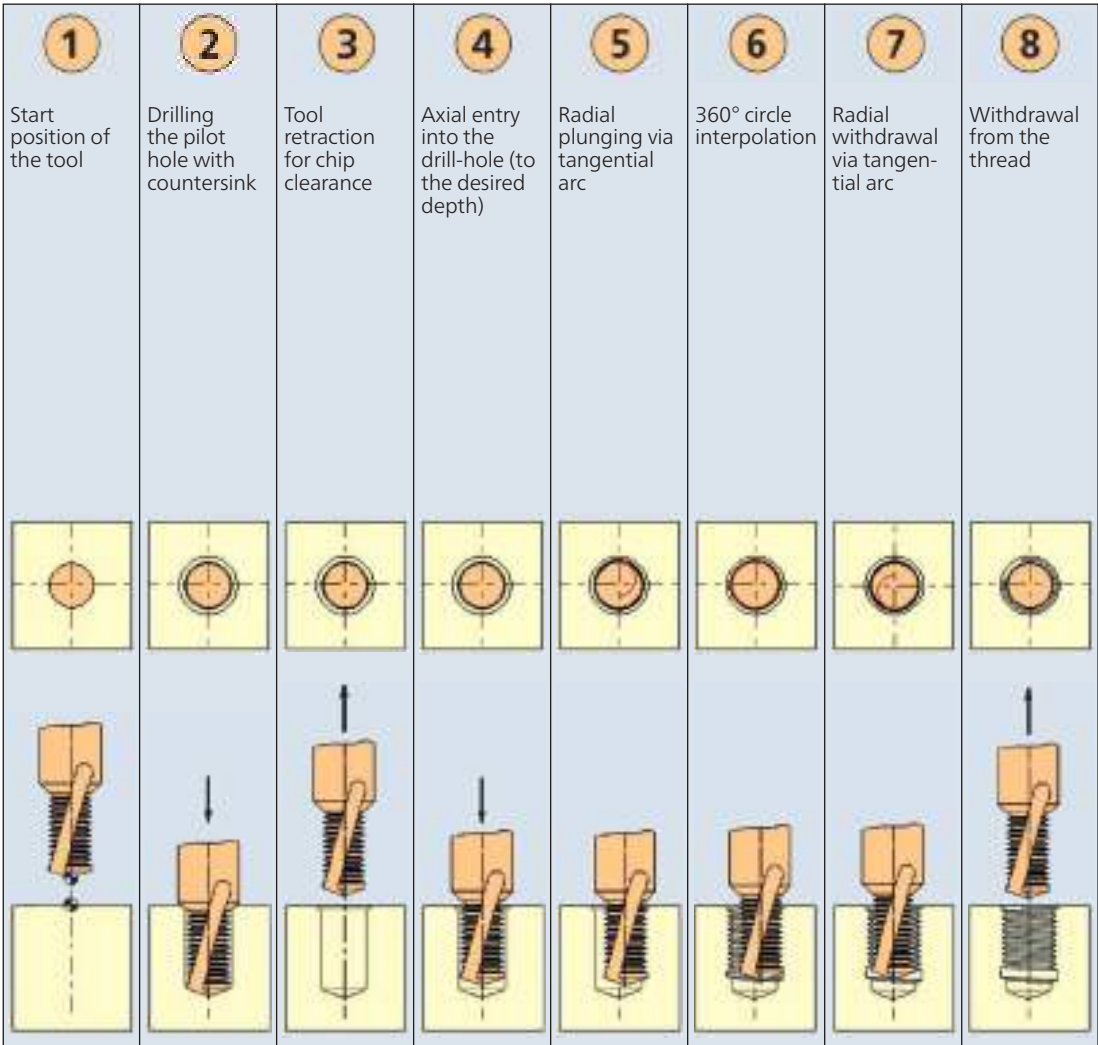


Meaning of the G and M commands used

G0	G1	G3	G40	G41	G90	G91	M3	M5	M8	M9
Linear motion at high speed	Linear motion with feed F in mm/min	Circular arc interpolation with mid-point (I, J)	Cancel too-radius correction	Tool-radius correction (tool to left of contour)	Absolute-measure-ment programming	Sequential-measure-ment programming	Spindle on (right-handed motion)	Spindle off	Cooling on	Cooling off

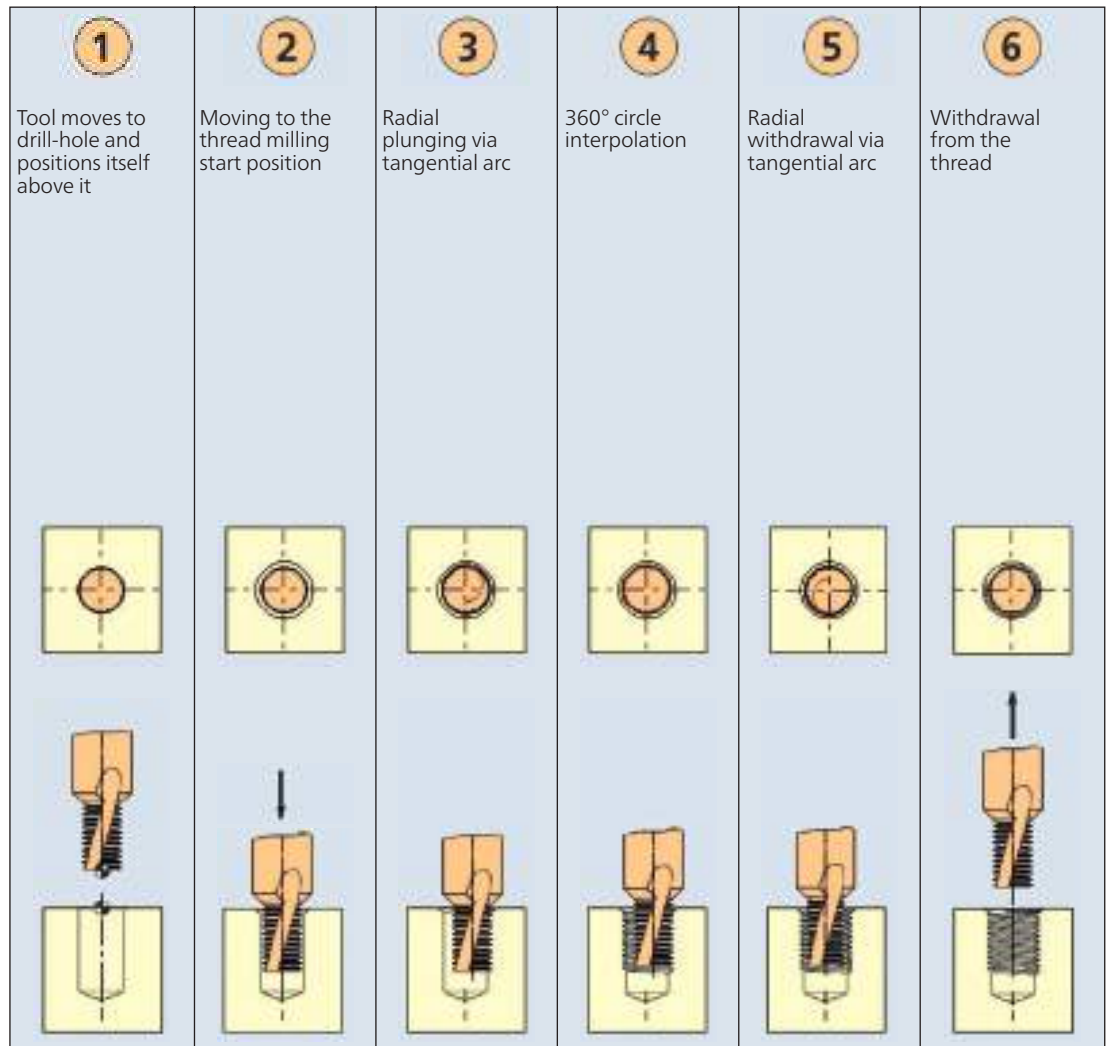
Technical notes regarding use of thread milling cutters

Thread milling cycle for drill / thread milling



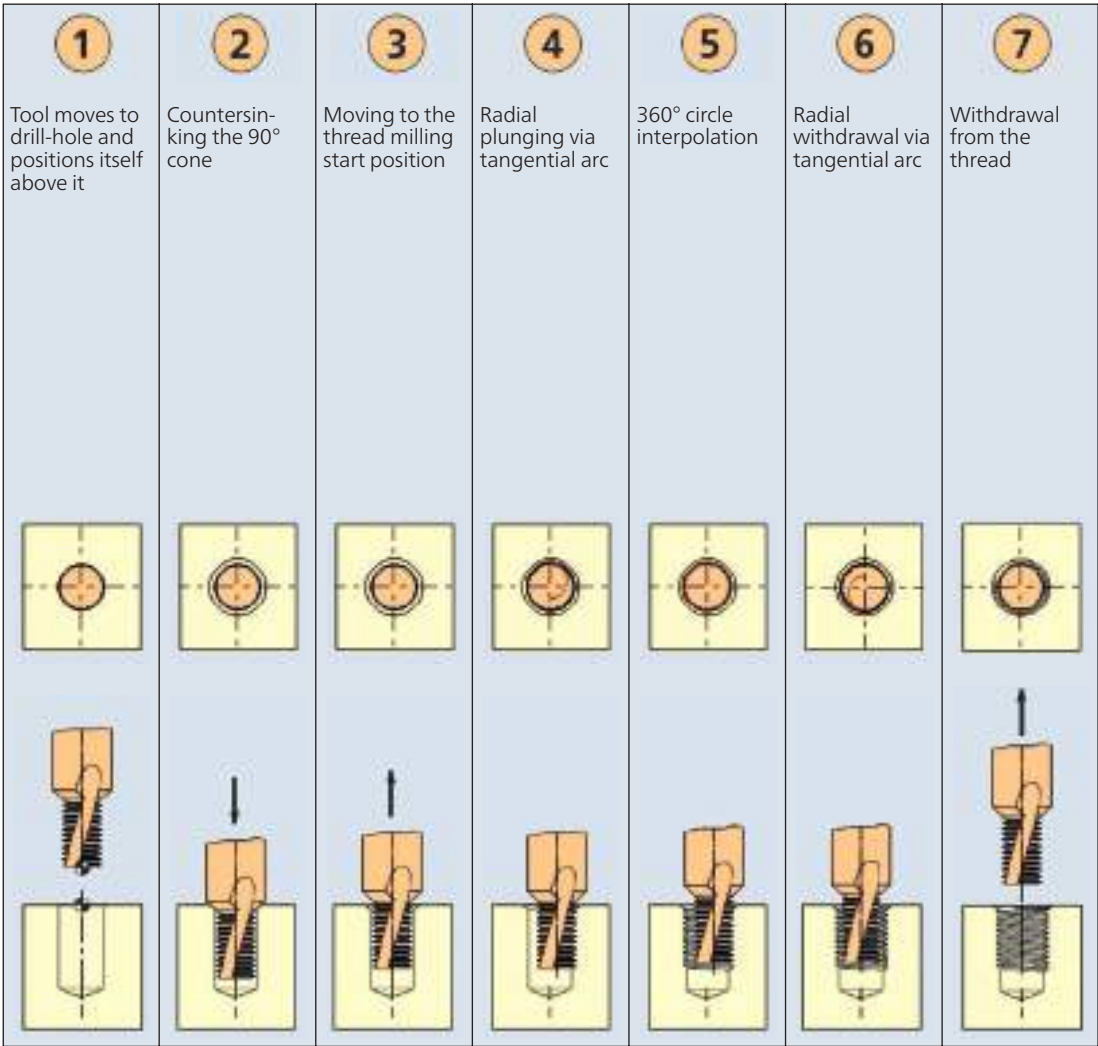
Technical notes regarding use of thread milling cutters

Thread milling cycle for thread milling cutters (recommended machining direction: up-cut milling)



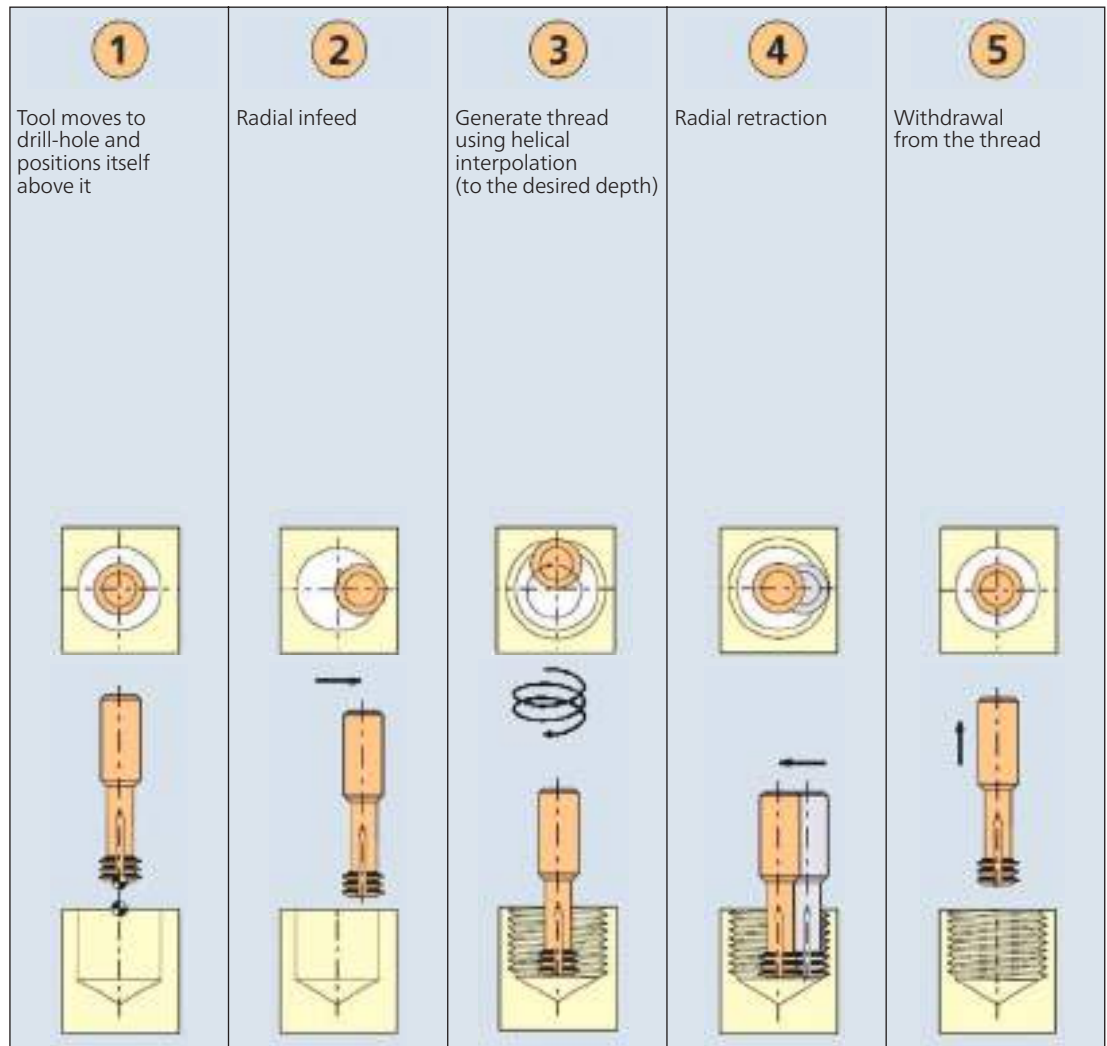
Technical notes regarding use of thread milling cutters

Thread milling cycle for thread milling cutter with chamfer



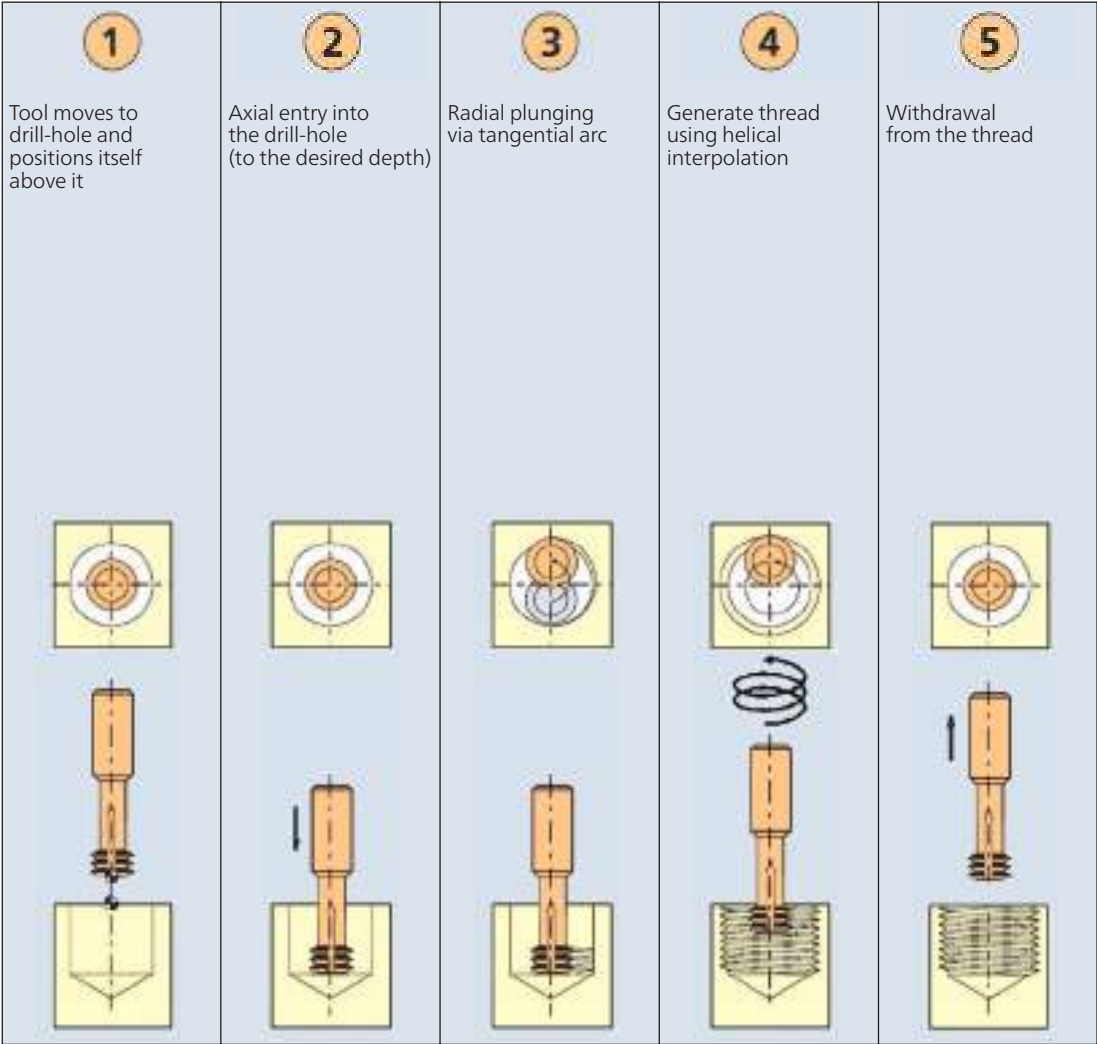
Technical notes regarding use of thread milling cutters

Thread milling cycle for thread milling cutter with chamfer (recommended machining direction)



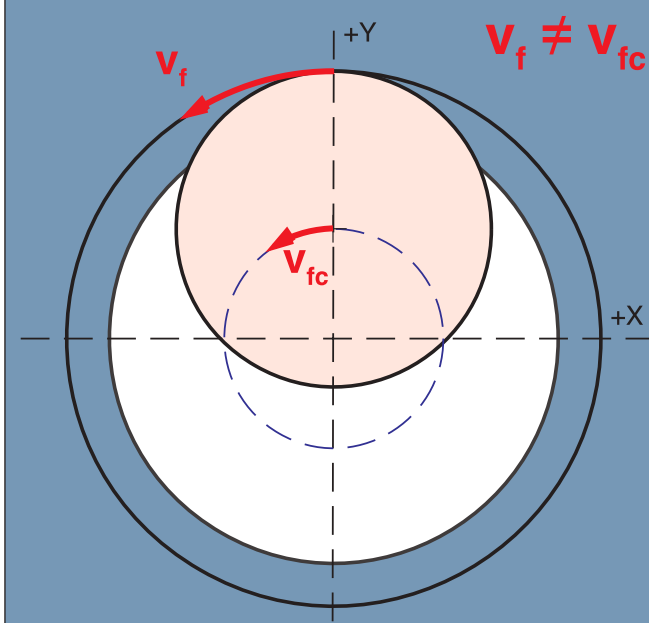
Technical notes regarding use of thread milling cutters

Thread milling cycle for right-handed thread clockwise-rotating with thread whirler



Technical notes regarding use of thread milling cutters

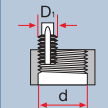
Specifying the feed speed



$v_f \neq v_{fc}$

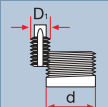
Conversion from feed v_f on the workpiece to the programming feed v_{fc} which is the feed in the tool centre:

For internal threads



$$v_{fc} = \frac{v_f \cdot (d - D_1)}{d}$$

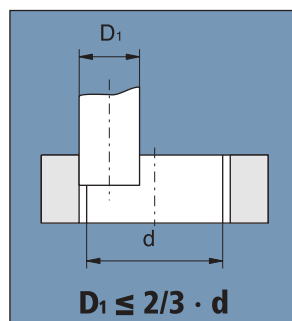
For external threads



$$v_{fc} = \frac{v_f \cdot (d + D_1)}{d}$$

Nominal thread diameter d

Avoiding profile distortions



In order to avoid profile distortions, the diameter of the thread milling cutter D_1 must not exceed $\frac{2}{3}$ of the nut core diameter d.

The overmeasure of the core drill-hole should be 0.1 to 0.3 mm.

The thread is thereby milled perfectly.

Formulas and abbreviations

a	Dimension of square end
d	Nominal diameter of the thread
d₁	Drilling diameter of the drill / thread milling cutter
d₂	Diameter of the shank
D₁	Diameter of the thread milling cutter
d/D₁	Ratio of diameters for the determination of the feed speed
R_k	Corrected milling cutter radius for ISO 2 (6H) thread tolerance (radius to be programmed in the machine control system)
f_z	Feed per tooth
l	Length of threaded section of the tap / thread former / thread milling cutter
l₁	Neck length of the tap / thread former / thread milling cutter
l₃	Flute length of the tap
L	Overall length of the tap / thread former / thread milling cutter
L_K	Countersinking depth of the thread milling cutter with chamfer
n	Spindle speed
P	Thread pitch
v_c	Cutting speed
v_f	Feed rate
v_{fc}	Feed speed in the tool centre
	Number of flutes on the tap and thread cutter
	Number of form edges of cold forming taps
Δ	Diameter differences of the thread flank, the thread outside and the thread core in the application class 2 (ISO 2) according to DIN 22857
R_m	Mechanical tensile strength
HRC	Hardness according to Rockwell C
HV	Hardness according to Vickers
HB	Hardness according to Brinell

Spindle speed	$n = \frac{v_c \cdot 1000}{d_1 \cdot \pi} \left[\frac{1}{\text{min}} \right]$
Cutting speed	$v_c = \frac{d \cdot \pi \cdot n}{1000} \left[\frac{\text{m}}{\text{min}} \right]$
Feed rate Taps	$v_f = P \cdot n \left[\frac{\text{mm}}{\text{min}} \right]$
Feed rate Thread milling cutters	$v_f = f_z \cdot z \cdot n \left[\frac{\text{mm}}{\text{min}} \right]$

Core hole drill sizes

M					
ø	P	Max. dimension	Standard	Critical material*	
1.0	0.25	0.785	0.75	0.80	*
1.2	0.25	0.985	0.95	1.00	*
1.4	0.30	1.142	1.10	1.15	*
1.6	0.35	1.321	1.25	1.30	
1.7	0.35	1.421	1.35	1.40	
1.8	0.35	1.521	1.45	1.50	
2.0	0.40	1.679	1.60	1.70	
2.2	0.45	1.838	1.75	1.85	*
2.3	0.40	1.979	1.90	1.95	
2.5	0.45	2.138	2.05	2.10	
2.6	0.45	2.238	2.15	2.20	
3.0	0.50	2.599	2.50	2.60	*
3.5	0.60	3.010	2.90	3.00	
4.0	0.70	3.422	3.30	3.40	
4.5	0.75	3.878	3.75	3.90	*
5.0	0.80	4.334	4.20	4.30	
6.0	1.00	5.153	5.00	5.10	
7.0	1.00	6.153	6.00	6.10	
8.0	1.25	6.912	6.80	6.90	
10.0	1.50	8.676	8.50	8.60	
12.0	1.75	10.441	10.20	10.40	
14.0	2.00	12.210	12.00	12.20	
16.0	2.00	14.210	14.00	14.20	
18.0	2.50	15.744	15.50	15.70	
20.0	2.50	17.744	17.50	17.70	
22.0	2.50	19.744	19.50	19.70	
24.0	3.00	21.252	21.00	21.20	
27.0	3.00	24.252	24.00	24.20	
30.0	3.50	26.771	26.50	26.70	
33.0	3.50	29.771	29.50	29.70	
36.0	4.00	32.270	32.00	32.20	
39.0	4.00	35.270	35.00	35.20	
42.0	4.50	37.799	37.50	37.70	

MF					
ø	P	Max. dimension	Standard	Critical material*	
2.5	0.35	2.221	2.15	2.20	
3.0	0.35	2.721	2.65	2.70	
3.5	0.35	3.221	3.15	3.20	
4.0	0.50	3.599	3.50	3.60	*
5.0	0.50	4.599	4.50	4.60	*
6.0	0.50	5.599	5.50	5.60	*
8.0	0.50	7.599	7.50	7.60	*
10.0	0.50	9.599	9.50	9.60	*
6.0	0.75	5.378	5.20	5.30	
7.0	0.75	6.378	6.25	6.30	
8.0	0.75	7.378	7.20	7.30	
10.0	0.75	9.378	9.20	9.30	
12.0	0.75	11.378	11.30	11.40	*
14.0	0.75	13.378	13.30	13.40	*
16.0	0.75	15.378	15.30	15.40	*
8.0	1.00	7.153	7.00	7.10	
9.0	1.00	8.153	8.00	8.10	
10.0	1.00	9.153	9.00	9.10	
12.0	1.00	11.153	11.00	11.10	
13.0	1.00	12.153	12.00	12.10	
14.0	1.00	13.153	13.00	13.10	
15.0	1.00	14.153	14.00	14.10	
16.0	1.00	15.153	15.00	15.10	
17.0	1.00	16.153	16.00	16.10	
18.0	1.00	17.153	17.00	17.10	
20.0	1.00	19.153	19.00	19.10	
10.0	1.25	8.912	8.80	8.90	
12.0	1.25	10.912	10.80	10.90	
14.0	1.25	12.912	12.80	12.90	
16.0	1.25	14.912	14.80	14.90	
12.0	1.50	10.676	10.50	10.70	*
14.0	1.50	12.676	12.50	12.70	*
16.0	1.50	14.676	14.50	14.70	*
18.0	1.50	16.676	16.50	16.70	*
20.0	1.50	18.676	18.50	18.70	*
22.0	1.50	20.676	20.50	20.70	*
24.0	1.50	22.676	22.50	22.70	*

* The given dimension is out of norm

Core hole drill sizes

MJ					
ø	P	Max. dimension	Standard	Critical material*	
2.0	0.40	1.722	1.65	1.70	
2.5	0.45	2.187	2.10	2.20	*
3.0	0.50	2.653	2.60	2.65	
4.0	0.70	3.498	3.40	3.50	*
5.0	0.80	4.421	4.30	4.40	
6.0	1.00	5.216	5.10	5.20	
8.0	1.00	7.216	7.10	7.20	
10.0	1.25	8.994	8.90	9.00	*

G					
ø	P	Max. dimension	Standard	Critical material*	
1/8	28	8.848	8.80	8.85	*
1/4	19	11.890	11.80	11.90	*
3/8	19	15.395	15.25	15.40	*
1/2	14	19.172	19.00	19.20	*
5/8	14	21.128	21.00	21.10	
3/4	14	24.658	24.50	24.60	

Rp					
ø	P	Max. dimension	Standard	Critical material*	
1/8	28	8.637	8.60	8.60	
1/4	19	11.549	11.50	11.50	
3/8	19	15.054	15.00	15.00	
1/2	14	18.773	18.50	18.70	
3/4	14	24.259	24.00	24.20	

Rc Rc 1:16 Conical reaming of the hole with a conical reamer 1:16						
ø	P(TPI)	ø	D max	D min	L min	
1/16	28	6.10	6.605	6.515	11.90	
1/8	28	8.10	8.615	8.525	11.90	
1/4	19	10.80	11.505	11.395	17.70	
3/8	19	14.30	15.005	14.895	18.10	
1/2	14	17.80	18.695	18.565	24.00	
3/4	14	23.00	24.185	24.055	25.30	

BSW					
ø	P	Max. dimension	Standard	Critical material*	
1/8	40	2.591	2.50	2.60	*
3/16	24	3.745	3.60	3.70	
1/4	20	5.156	5.10	5.10	
5/16	18	6.588	6.50	6.60	*
3/8	16	7.988	7.90	8.00	*
7/16	14	9.332	9.20	9.30	
1/2	12	10.589	10.50	10.60	*
5/8	11	13.558	13.50	13.50	
3/4	10	16.484	16.20	16.50	*
7/8	9	19.355	19.20	19.30	
1	8	22.1492	22.00	22.10	

W zyl. Cylindrical drilling					
ø	P	Max. dimension	Standard	Critical material*	
21.80	14	20.066	19.80	20.00	
24.32	14	22.586	22.30	22.50	

W

kon.

W kon 3:25 Conical reaming of the hole with a conical reamer 3:25



ø	P(TPI)	ø	D max	D min	L min
19.80	14	14.60	16.880	16.760	23.50
28.80	14	22.60	25.480	25.360	28.50

* The given dimension is out of norm

Core hole drill sizes

UNC						
ø	P	Max. dimension	Standard	Critical material*		
1	64	1.582	1.55	1.60	*	
2	56	1.872	1.85	1.90	*	
3	48	2.146	2.10	2.15	*	
4	40	2.385	2.35	2.40	*	
5	40	2.697	2.65	2.70	*	
6	32	2.896	2.85	2.90	*	
8	32	3.531	3.50	3.50		
10	24	3.962	3.90	4.00	*	
12	24	4.597	4.50	4.60	*	
1/4	20	5.258	5.10	5.20		
5/16	18	6.731	6.60	6.70		
3/8	16	8.153	8.00	8.10		
7/16	14	9.550	9.40	9.50		
1/2	13	11.024	10.80	11.00		
9/16	12	12.446	12.20	12.40		
5/8	11	13.868	13.50	13.80		
3/4	10	16.840	16.50	16.80		
7/8	9	19.761	19.50	19.70		
1	8	22.601	22.30	22.60		

UNF						
ø	P	Max. dimension	Standard	Critical material*		
0	80	1.306	1.25	1.30		
1	72	1.613	1.55	1.60		
2	64	1.913	1.85	1.90		
3	56	2.197	2.15	2.20	*	
4	48	2.459	2.40	2.45		
5	44	2.741	2.70	2.75	*	
6	40	3.023	2.95	3.00		
8	36	3.607	3.50	3.60		
10	32	4.166	4.10	4.20	*	
12	28	4.727	4.60	4.70		
1/4	28	5.588	5.50	5.60	*	
5/16	24	7.036	6.90	7.00		
3/8	24	8.636	8.50	8.60		
7/16	20	10.033	9.90	10.00		
1/2	20	11.608	11.50	11.60		
9/16	18	13.081	12.90	13.00		
5/8	18	14.681	14.50	14.70	*	
3/4	16	17.678	17.50	17.70	*	
7/8	14	20.675	20.50	20.70	*	
1	12	23.571	23.30	23.50		

UNJC						
ø	P	Max. dimension	Standard	Critical material*		
4	40	2.392	2.30	2.40	*	
6	32	2.938	2.85	2.90		
8	32	3.599	3.50	3.60	*	
10	24	4.064	3.90	4.00		
1/4	20	5.387	5.25	5.40	*	
5/16	18	6.832	6.70	6.80		
3/8	16	8.257	8.10	8.20		

UNJF						
ø	P	Max. dimension	Standard	Critical material*		
6	40	3.053	3.00	3.05		
8	36	3.662	3.55	3.60		
10	32	4.254	4.15	4.20		
1/4	28	5.661	5.55	5.60		
5/16	24	7.109	7.00	7.10		
3/8	24	8.679	8.60	8.70	*	

UNEJ						
ø	P	Max. dimension	Standard	Critical material*		
1/4	32	5.689	5.60	5.70	*	
5/16	32	7.264	7.20	7.30	*	
3/8	32	8.864	8.80	8.90	*	
7/16	28	10.337	10.20	10.30		
1/2	28	11.938	11.80	11.90		
9/16	24	13.385	13.20	13.40	*	
5/8	24	14.986	14.80	15.00	*	
11/16	24	16.560	16.40	16.50		
3/4	20	17.957	17.80	18.00	*	
7/8	20	21.132	21.00	21.10		
1	20	24.307	24.20	24.30		

* The given dimension is out of norm

Core hole drill sizes

NPT					
1:16 Conical reaming of the hole with a conical reamer 1:16					
ø	P(TPI)	ø	D max	D min	L min
1/16	27	6.00	6.440	6.390	12.00
1/8	27	8.30	8.790	8.740	12.00
1/4	18	10.80	11.410	11.360	17.50
3/8	18	14.20	14.850	14.800	17.60
1/2	14	17.50	18.370	18.320	22.90
3/4	14	22.80	23.720	23.670	23.00
1	11.5	28.60	29.740	29.690	27.40



NPTF					
1:16 Conical reaming of the hole with a conical reamer 1:16					
ø	P(TPI)	ø	D max	D min	L min
1/16	27	6.00	6.460	6.410	12.00
1/8	27	8.30	8.810	8.760	12.00
1/4	18	10.80	11.450	11.400	17.50
3/8	18	14.20	14.890	14.840	17.60
1/2	14	17.50	18.380	18.330	22.90
3/4	14	22.80	23.730	23.680	23.00
1	11.5	28.60	29.770	29.720	27.40



NPSM				
ø	P	Max. dimension	Standard	Critical material*
1/8	27	9.246	9.10	9.20
1/4	18	12.217	12.00	12.20
3/8	18	15.545	15.50	15.50
1/2	14	19.279	19.00	19.20
3/4	14	24.638	24.50	24.60



PG				
ø	P	Max. dimension	Standard	Critical material*
7	20	11.430	11.40	11.40
9	18	14.010	14.00	14.00
11	18	17.410	17.30	17.40
13.5	18	19.210	19.10	19.20
16	18	21.310	21.25	21.30



* The given dimension is out of norm

EG M				
ø	P	Max. dimension	Standard	Critical material*
2.0	0.40	2.177	2.15	2.20 *
2.5	0.45	2.697	2.65	2.70 *
3.0	0.50	3.220	3.15	3.20
4.0	0.70	4.292	4.20	4.30 *
5.0	0.80	5.334	5.25	5.30
6.0	1.00	6.407	6.30	6.40
8.0	1.25	8.483	8.40	8.50 *
10.0	1.50	10.560	10.40	10.50
12.0	1.75	12.644	12.50	12.60
14.0	2.00	14.733	14.50	14.70
16.0	2.00	16.733	16.50	16.70



EG MF				
ø	P	Grösstmass	Standard	Critical material*
8.0	1.00	8.407	8.30	8.40
10.0	1.00	10.407	10.30	10.40
12.0	1.50	12.560	12.50	12.50
14.0	1.50	14.560	14.50	14.50
16.0	1.50	16.560	16.50	16.50



EG UNC				
ø	P	Max. dimension	Standard	Critical material*
4	40	3.178	3.10	3.20 *
6	32	3.879	3.80	3.90 *
8	32	4.523	4.40	4.50
10	24	5.283	5.20	5.30 *
1/4	20	6.872	6.70	6.90 *
5/16	18	8.490	8.40	8.50 *
3/8	16	10.126	10.00	10.10
1/2	13	13.393	13.30	13.40 *



EG UNF				
ø	P	Max. dimension	Standard	Critical material*
6	40	3.815	3.70	3.80
8	36	4.496	4.40	4.50 *
10	32	5.184	5.10	5.20 *
1/4	28	6.720	6.60	6.70
5/16	24	8.351	8.30	8.40 *
3/8	24	9.931	9.80	9.90
7/16	20	11.587	11.50	11.60 *
1/2	20	13.176	13.10	13.20 *





Hardness conversion table (R_m → HV10 → HB → HRC)

R _m [N/mm ²]	HV 10	HB	HRC		R _m [N/mm ²]	HV 10	HB	HRC
240	75	71			920	287	273	28
255	80	76			940	293	278	29
270	85	81			970	302	287	30
285	90	86			995	310	295	31
305	95	90			1020	317	301	32
320	100	95			1050	327	311	33
335	105	100			1080	336	319	34
350	110	105			1110	345	328	35
370	115	109			1140	355	337	36
385	120	114			1170	364	346	37
400	125	119			1200	373	354	38
415	130	124			1230	382	363	39
430	135	128			1260	392	372	40
450	140	133			1300	403	383	41
465	145	138			1330	413	393	42
480	150	143			1360	423	402	43
495	155	147			1400	434	413	44
510	160	152			1440	446	424	45
530	165	157			1480	458	435	46
545	170	162			1530	473	449	47
560	175	166			1570	484	460	48
575	180	171			1620	497	472	49
595	185	176			1680	514	488	50
610	190	181			1730	527	501	51
625	195	185			1790	544	517	52
640	200	190			1845	560	532	53
660	205	195			1910	578	549	54
675	210	199			1980	596	567	55
690	215	204			2050	615	584	56
705	220	209			2140	639	607	57
720	225	214				655	622	58
740	230	219				675		59
755	235	223				698		60
770	240	228				720		61
785	245	233				745		62
800	250	238	22			773		63
820	255	242	23			800		64
835	260	247	24			829		65
860	268	255	25			864		66
870	272	258	26			900		67
900	280	266	27			940		68

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		without	AlCrTiN	AlCrTiN	TiCN	TiAlN	TRIBO	INTEGRAL	F-DLC	LONGCUT
Chemical composition			AlCrTiN	AlCrTiN	TiCN	TiAlN	TiAlN	TiAlN	DLC	AlCrN
Hardness [HV]			3000	3000	3000	3400	3000	3500	2800	3200
Max. temp. [°C]			600	600	400	450	300	1000	500	1100
E 10130	257	●								
E 10131	257	●								
E 10135	259	●								
E 10136	259	●								
E 10140	261	●								
E 10141	261	●								
E 10145	263	●								
E 10146	263	●								
E 10150	269	●								
E 10151	269	●								
E 10155	271	●								
E 10156	271	●								
E 10345	253	●								
E 10355	255	●								
E 10410	243	●								
E 10411	243	●								
E 10420	273	●								
E 10800	245	●								
E 10801	247	●								
E 10820	249	●								
E 10821	251	●								
E 11955	299	●								
E 11965	301	●								
E 22200	197	●								
E 22300	195	●								
EC 10540	207		●							
EC 10541	207		●							
EC 10545	209		●							
EC 10550	211		●							
EC 10551	211		●							
EC 10560	213		●							
EC 10561	213		●							
EC 10570	215		●							
EC 10580	217		●							
EF 10060	305								●	
EF 10061	307								●	

Article-Nº.		Coating								
INDEX		<u>E</u>	<u>EC</u>	<u>EH</u>	<u>EH</u>	<u>EK</u>	<u>ET</u>	<u>EI</u>	<u>EF</u>	<u>EL</u>
		without	AlCrTiN	AlCrTiN	TiCN	TiAlN	TRIBO	INTEGRAL	F-DLC	LONGCUT
EH 0100	219			●						
EH 0101	219			●						
EH 0595	223			●						
EH 0596	223			●						
EH 0600	227			●						
EH 0601	227			●						
EH 6100	309			●						
EH 6101	309			●						
EH 6350	235			●						
EH 6351	235			●						
EH 6550	229			●						
EH 6551	229			●						
EH 6900	225			●						
EH 6901	225			●						
EH 10040	319				●					
EH 10041	319				●					
EH 10070	315			●						
EH 10071	317			●						
EH 10310	221			●						
EH 10311	221			●						
EH 20300	167				●					
EH 20306	167				●					
EH 20320	169				●					
EH 20326	169				●					
EH 20340	171				●					
EH 20360	173				●					
EH 20370	175				●					
EH 20380	177				●					
EH 20390	179				●					
EH 22200	197				●					
EH 22300	195				●					
EH 24200	191				●					
EH 24220	193				●					
EH 24300	181				●					
EH 24320	183				●					
EH 24340	185				●					
EH 24360	187				●					
EH 24370	189				●					
EH 26020	199				●					
EH 26040	201				●					
EH 27500	157				●					
EH 27502	159				●					
EH 27540	163				●					
EH 27560	165				●					
EI 0020	231							●		
EI 0021	231							●		
EI 0050	233							●		
EI 0051	233							●		
EI 27504	161							●		
EK 10590	265					●				
EK 10591	265					●				
EK 10595	267					●				
EK 10596	267					●				
EK 11200	277					●				
EK 11210	281					●				
EK 11400	287					●				
EK 11410	289					●				
EK 11670	293					●				
EK 11671	293					●				
EK 11680	295					●				
EK 11681	295					●				

[illegible]

