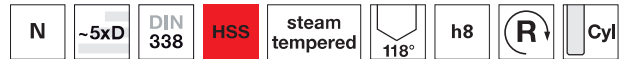


Straight shank twist drills

Jobber drills



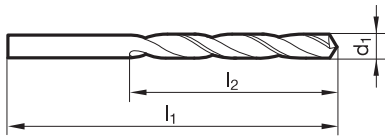
Catalog no. 71115



P	M	K	N	S	H
•		•	•		

Application
recomm. p. 180

- web thinning $\geq \varnothing 2.180$
- relieved cone
- bright < 2.36 mm



d1 mm	inch	l1 mm	l2 mm	d1 mm	inch	l1 mm	l2 mm
2.000		49.000	24.000	3.550		70.000	39.000
2.050		49.000	24.000	3.570	9/64	70.000	39.000
2.060		49.000	24.000	3.600		70.000	39.000
2.080		49.000	24.000	3.650		70.000	39.000
2.100		49.000	24.000	3.660		70.000	39.000
2.150		53.000	27.000	3.700		70.000	39.000
2.180		53.000	27.000	3.730		70.000	39.000
2.200		53.000	27.000	3.750		70.000	39.000
2.250		53.000	27.000	3.800		75.000	43.000
2.260		53.000	27.000	3.850		75.000	43.000
2.300		53.000	27.000	3.860		75.000	43.000
2.350		53.000	27.000	3.900		75.000	43.000
2.370		57.000	30.000	3.910		75.000	43.000
2.380	3/32	57.000	30.000	3.950		75.000	43.000
2.400		57.000	30.000	3.970	5/32	75.000	43.000
2.440		57.000	30.000	3.990		75.000	43.000
2.450		57.000	30.000	4.000		75.000	43.000
2.490		57.000	30.000	4.040		75.000	43.000
2.500		57.000	30.000	4.050		75.000	43.000
2.530		57.000	30.000	4.090		75.000	43.000
2.550		57.000	30.000	4.100		75.000	43.000
2.580		57.000	30.000	4.150		75.000	43.000
2.600		57.000	30.000	4.200		75.000	43.000
2.640		57.000	30.000	4.220		75.000	43.000
2.650		57.000	30.000	4.250		75.000	43.000
2.700		61.000	33.000	4.300		80.000	47.000
2.710		61.000	33.000	4.350		80.000	47.000
2.750		61.000	33.000	4.370	11/64	80.000	47.000
2.780	7/64	61.000	33.000	4.390		80.000	47.000
2.790		61.000	33.000	4.400		80.000	47.000
2.800		61.000	33.000	4.500		80.000	47.000
2.820		61.000	33.000	4.550		80.000	47.000
2.850		61.000	33.000	4.570		80.000	47.000
2.900		61.000	33.000	4.600		80.000	47.000
2.950		61.000	33.000	4.650		80.000	47.000
3.000		61.000	33.000	4.700		80.000	47.000
3.050		65.000	36.000	4.750		80.000	47.000
3.100		65.000	36.000	4.760	3/16	86.000	52.000
3.150		65.000	36.000	4.800		86.000	52.000
3.170	1/8	65.000	36.000	4.850		86.000	52.000
3.200		65.000	36.000	4.900		86.000	52.000
3.250		65.000	36.000	4.950		86.000	52.000
3.260		65.000	36.000	5.000		86.000	52.000
3.300		65.000	36.000	5.050		86.000	52.000
3.350		65.000	36.000	5.100		86.000	52.000
3.400		70.000	39.000	5.110		86.000	52.000
3.450		70.000	39.000	5.160	13/64	86.000	52.000
3.500		70.000	39.000	5.180		86.000	52.000

Application recommendations for drills

Feed column										
Code-letter	A	B	C	D	E	F	G	H	I	
Drill-Ø mm	0,50	0,004	0,006	0,007	0,008	0,010	0,012	0,014	0,016	0,019
	1,00	0,006	0,008	0,012	0,014	0,016	0,018	0,020	0,023	0,025
	2,00	0,020	0,025	0,032	0,040	0,050	0,063	0,080	0,100	0,125
	2,50	0,025	0,032	0,040	0,050	0,063	0,080	0,100	0,125	0,160
	3,15	0,032	0,040	0,050	0,063	0,080	0,100	0,125	0,160	0,160
	4,00	0,040	0,050	0,063	0,080	0,100	0,125	0,160	0,200	0,200
	5,00	0,040	0,050	0,063	0,080	0,100	0,125	0,160	0,200	0,250
	6,30	0,050	0,063	0,080	0,100	0,125	0,160	0,200	0,250	0,315
	8,00	0,063	0,080	0,100	0,125	0,160	0,200	0,250	0,315	0,315
	10,00	0,080	0,100	0,125	0,160	0,200	0,250	0,315	0,400	0,400
	12,50	0,080	0,100	0,125	0,160	0,200	0,250	0,315	0,400	0,500
	16,00	0,100	0,125	0,160	0,200	0,250	0,315	0,400	0,500	0,630
	20,00	0,125	0,160	0,200	0,250	0,315	0,400	0,500	0,630	0,630
	25,00	0,160	0,200	0,250	0,315	0,400	0,500	0,630	0,800	0,800
	31,50	0,160	0,200	0,250	0,315	0,400	0,500	0,630	0,800	1,000
	40,00	0,200	0,250	0,315	0,400	0,500	0,630	0,800	1,000	1,250

Tools with feed column no. in bold are preferred choices for listed material group.

Lubricants:

- cutting oil, highly activated
- soluble oil (emulsion)
- without lubricant
- air only

Material group	Materials examples, new designations (old designation in brackets) Figures in bold = material no. to DIN EN	Tensile strength MPa (N/mm²)	Hardness	Coolant
General purpose steels	1.0035 S185(St33), 1.0486 P275N(StE285), 1.0345 P235GH(H1), 1.0425 P265GH(H2) 1.0050 E295 (St50-2), 1.0070 E360 (St70-2), 1.8937 P500NH (WStE500)	≤500 >500-850		<input checked="" type="checkbox"/> <input checked="" type="checkbox"/>
Free-cutting steels	1.0718 11SMnPb30 (9SMnPb28), 1.0736 11SMn37 (9SMn36) 1.0727 46S20 (45S20), 1.0728 (60S20), 1.0757 46SPb20 (45SPb20)	≤850 850-1000		<input checked="" type="checkbox"/> <input checked="" type="checkbox"/>
Unalloyed tempering steels	1.0402 C22, 1.1178 C30E (Ck30) 1.0503 C45, 1.1191 C45E (Ck45) 1.0601 C60, 1.1221 C60E (Ck60)	≤ 700 700-850 850-1000		<input checked="" type="checkbox"/> <input checked="" type="checkbox"/> <input checked="" type="checkbox"/>
Alloyed tempering steels	1.5131 50MnSi4, 1.7003 38Cr2, 1.7030 28Cr4 1.5710 36NiCr6, 1.7035 41Cr4, 1.7225 42CrMo4	850-≤1000 1000-1200		<input checked="" type="checkbox"/> <input checked="" type="checkbox"/>
Unalloyed case hardened steels	1.0301 (C10), 1.1121 C10E (Ck10)	≤750		<input checked="" type="checkbox"/>
Alloyed case hardened steels	1.7043 38Cr4 1.5752 15NiCr13 (15NiCr13), 1.7131 16MnCr5, 1.7264 20CrMo5	850-≤1000 1000-1200		<input checked="" type="checkbox"/> <input checked="" type="checkbox"/>
Nitriding steels	1.8504 34CrAl6 1.8519 31CrMoV9, 1.8550 34CrAlNi7	≥850-≤1000 >1000-1200		<input checked="" type="checkbox"/> <input checked="" type="checkbox"/>
Tool steels	1.1750 C75W, 1.2067 102Cr6, 1.2307 29CrMoV9 1.2080 X210Cr12, 1.2083 X42Cr13, 1.2419 105WCr6, 1.2767 X45NiCrMo4	≤850 >850-1000		<input checked="" type="checkbox"/> <input checked="" type="checkbox"/>
High speed steels	1.3243 S 6-5-2-5, 1.3343 S 6-5-2, 1.3344 S 6-5-3	≥850-1000		<input checked="" type="checkbox"/>
Spring steels	1.5026 55Si7, 1.7176 55Cr3, 1.8159 51CrV4 (51CrV4)		≤330 HB	<input checked="" type="checkbox"/>
Hardened steels	-		≤40-48 HRC >48-60 HRC	<input checked="" type="checkbox"/> <input checked="" type="checkbox"/>
Stainless steels, sulphured austenitic martensitic	1.4005 X12CrS13, 1.4104 X14CrMoS17, 1.4105 X6CrMoS17, 1.4305 X8CrNiS18-9 1.4301 X5CrNi18-10 (V2A), 1.4541 X6CrNiTi18-10, 1.4571 X6CrNiMoTi 17-12-2 (V4A) 1.4057 X20CrNi17 2 (X17CrNi16-2), 1.4122 X39CrMo17-1, 1.4521 X2CrMoTi18-2	≤850 ≤850 ≤850		<input checked="" type="checkbox"/> <input checked="" type="checkbox"/> <input checked="" type="checkbox"/>
Cast iron	0.6010 EN-GJL-100(GG10), 0.6020 EN-GJL-200(GG20) 0.6025 EN-GJL-250(GG25), 0.6035 EN-GJL-350(GG35)	850-≤1000 1000-1200		<input checked="" type="checkbox"/> <input checked="" type="checkbox"/>
Spheroidal graphite iron and malleable cast iron	0.7050 EN-GJS-500-7(GGG50), 0.8035 EN-GJMw-350-4(GTW35) 0.7070 EN-GJS-700-2(GGG70), 0.8170 EN-GJMB-700-2(GTS70)		≤240 HB <300 HB	<input checked="" type="checkbox"/> <input checked="" type="checkbox"/>
Chilled cast iron	-		≤350 HB	<input checked="" type="checkbox"/>
New Cast iron GGV	EN-GJV250 (GGV25), EN-GJV350 (GGV35) EN-GJV400 (GGV40), EN-GJV500 (GGV50), SiMo6			<input checked="" type="checkbox"/> <input checked="" type="checkbox"/>
New Cast iron ADI	EN-GJS-800-8 (ADI800), EN-GJS-1000-5 (ADI1000) EN-GJS-1200-2 (ADI1200), EN-GJS-1400-1 (ADI1400)	800-1000 1200-1400		<input checked="" type="checkbox"/> <input checked="" type="checkbox"/>
Special alloys	Nimonic, Inconel, Monel, Hastelloy	≤1200		<input checked="" type="checkbox"/>
Ti and Ti-alloys	3.7024 Ti99,5, 3.7114 TiAl5Sn2,5, 3.7124 TiCu2 3.7154 TiAl6Zr5, 3.7165 TiAl6V4, 3.7184 TiAl4Mo4Sn2,5, - TiAl8Mo1V1	≤850 >850-1200		<input checked="" type="checkbox"/> <input checked="" type="checkbox"/>
Aluminium and Al-alloys	3.0255 Al99,5, 3.2315 AlMgSi1, 3.3515 AlMg1	≤400		<input checked="" type="checkbox"/>
Al wrought alloys	3.0615 AlMgSiPb, 3.1325 AlCuMg1, 3.3245 AlMg3Si, 3.4365 AlZnMgCu1,5	≤450		<input checked="" type="checkbox"/>
Al cast alloys ≤ 10 % Si > 10 % Si	3.2131 G-AlSi5Cu1, 3.2153 G-AlSi7Cu3, 3.2573 G-AlSi9 3.2581 G-AlSi12, 3.2583 G-AlSi12Cu, - G-AlSi12CuNiMg	≤600 ≤600		<input checked="" type="checkbox"/> <input checked="" type="checkbox"/>
Magnesium alloys	3.5200 MgMn2, 3.5812.05 G-MgAl8Zn1, 3.5612.05 G-MgAl6Zn1	≤450		<input type="checkbox"/>
Copper, low alloyed	2.0070 SE-Cu, 2.1020 CuSn6, 2.1096 G-CuSn5ZnPb	≤400		<input checked="" type="checkbox"/>
Brass, short-chipping long-chipping	2.0380 CuZn39Pb2, 2.0401 CuZn39Pb3, 2.0410 CuZn43Pb2 2.0250 CuZn20, 2.0280 CuZn33, 2.0332 CuZn37Pb0,5	≤600 ≤600		<input checked="" type="checkbox"/> <input checked="" type="checkbox"/>
Bronze, short-chipping	2.1090 CuSn7ZnPb, 2.1170 CuPb5Sn5, 2.1176 CuPb10Sn 2.0790 CuNi18Zn19Pb	≤600 >600-850		<input checked="" type="checkbox"/> <input checked="" type="checkbox"/>
Bronze, long-chipping	2.0916 CuAl5, 2.0960 CuAl9Mn, 2.1050 CuSn10 2.0980 CuAl11Ni, 2.1247 CuBe2	≤850 >850-1000		<input checked="" type="checkbox"/> <input checked="" type="checkbox"/>
Duroplastics	Epoxy resin, Resopal, Pertinax, Moltopren			<input type="checkbox"/>
Thermoplastics	Plexiglas, Hostalen, Novodur, Makralon			<input checked="" type="checkbox"/>
Kevlar	Kevlar			<input type="checkbox"/>
Glass/carbon-concentr. plastics	GFK/CFK			<input type="checkbox"/>

≤5×D drilling depth

Catalog no.	71116 71119 ^L	71115	71300	71117	71124 71126 ^L	71305	71128 71129 ^L
Tool material	HSS	HSS	HSS	HSS	HSS	HSS	HSS
Surface finish	bright	bright/st.	steam	bright	bright	bright	bright
DIN/Form	338	338	345	338	338	345	338
Type	N	N	N	H	V70	V70	V72
Page	212/214	215	298	226	239/241	302	248/250

61116	61124	61115	61223
HSS	HSS	HSS	HSS-Co
TiN	TiN	TiN-tipped	TiN
338	338	338	338
N	V70	N	V66 Ti
218	243	220	236



v _c m/min	Feed column no.					
27	F	F	F	F	F	F
22	E	E	E	E	E	E
30	F	F	F	F	F	F
30	E	E	E	E	E	E
25	E	E	E	E	E	E
25	E	E	E	E	E	E
30	F	F	F	F	F	F
16	D	D	D	D	D	D
30	F	F	F	G	G	F
30	F	F	F	F	F	F
25	F	F	F	F	F	F
25	F	F	F	F	F	F
80				G	G	G
80				G	G	G
70	G	G	G	G	G	G
70	F	F	F	F	F	F
50	F	F	F	F	F	F
50	E	E	E	F	F	E
70				F	F	E
40	E	E	E	F	F	E
30	D	D	D	D	D	D
25	D	D	D	D	D	D
15	D	D	D	D	D	D
18	D	D	D	D	D	D
28	E	E	E	E	D	E

v _c m/min	Feed column no.	
30	F	F
24	E	E
33	F	F
33	E	E
28	E	E
28	E	E
25	D	D
22	D	D
33	F	F
20	D	D
14	D	D
18	D	D
33	F	G
33	F	F
28	F	F
22	F	F
80	F	F
65	E	E
75	E	E
45	E	E
33	D	D
27	D	D
16	D	D
15	D	D
22	D	D
36	E	D

v _c m/min	Feed col. no.
30	F
24	E
33	F
33	E
28	E
28	E
25	D
22	D
33	F
20	D
14	D
18	D
33	F
33	F
28	F
22	F
80	F
65	E
75	E
45	E
33	D
27	D
16	D
15	D
22	D
36	E

v _c m/min	Feed col. no.
22	C
14	C
9	B
20	D
15	C
18	C
12	C
6	B
11	B
7	B
17	D