

SuperV drills

SuperV drills with internal coolant

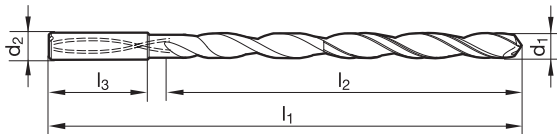


Catalog no. 51764



P	M	K	N	S	H	Application recomm. p. 32
●	●	●	○	○		

- web thinning $\geq \varnothing 3.000$
- relieved cone
- tip coating
- main cutting edge form concave
- optimised flute design
- maximum diameter of coolant ducts
- application in hydraulic chucks
- double margin
- observe coolant pressure (see diagram "coolant recommendations")



d1 mm	inch	d2 mm	l1 mm	l2 mm	l3 mm
3.000		6.000	95.000	55.000	36.000
3.170	1/8	6.000	106.000	67.000	36.000
3.500		6.000	116.000	76.000	36.000
3.570	9/64	6.000	116.000	76.000	36.000
3.970	5/32	6.000	116.000	76.000	36.000
4.000		6.000	116.000	76.000	36.000
4.370	11/64	6.000	133.000	93.000	36.000
4.500		6.000	133.000	93.000	36.000
4.760	3/16	6.000	133.000	93.000	36.000
5.000		6.000	133.000	93.000	36.000
5.100		6.000	150.000	110.000	36.000
5.160	13/64	6.000	150.000	110.000	36.000
5.410		6.000	150.000	110.000	36.000
5.500		6.000	150.000	110.000	36.000
5.560	7/32	6.000	150.000	110.000	36.000
5.950	15/64	6.000	150.000	110.000	36.000
6.000		6.000	150.000	110.000	36.000
6.350	1/4	8.000	167.000	127.000	36.000
6.500		8.000	167.000	127.000	36.000
6.750	17/64	8.000	167.000	127.000	36.000
7.000		8.000	167.000	127.000	36.000
7.140	9/32	8.000	183.000	143.000	36.000
7.500		8.000	183.000	143.000	36.000
7.540	19/64	8.000	183.000	143.000	36.000

d1 mm	inch	d2 mm	l1 mm	l2 mm	l3 mm
7.940	5/16	8.000	183.000	143.000	36.000
8.000		8.000	183.000	143.000	36.000
8.330	21/64	10.000	204.000	160.000	40.000
8.500		10.000	204.000	160.000	40.000
8.730	11/32	10.000	204.000	160.000	40.000
9.000		10.000	204.000	160.000	40.000
9.130	23/64	10.000	221.000	177.000	40.000
9.520	3/8	10.000	221.000	177.000	40.000
9.920	25/64	10.000	221.000	177.000	40.000
10.000		10.000	221.000	177.000	40.000
10.320	13/32	12.000	247.000	198.000	45.000
10.720	27/64	12.000	247.000	198.000	45.000
11.000		12.000	247.000	198.000	45.000
11.110	7/16	12.000	263.000	214.000	45.000
11.510	29/64	12.000	263.000	214.000	45.000
11.910	15/32	12.000	263.000	214.000	45.000
12.000		12.000	263.000	214.000	45.000
12.300	31/64	14.000	297.000	248.000	45.000
12.700	1/2	14.000	297.000	248.000	45.000
13.100	33/64	14.000	297.000	248.000	45.000
13.490	17/32	14.000	297.000	248.000	45.000
13.890	35/64	14.000	297.000	248.000	45.000
14.000		14.000	297.000	248.000	45.000

Application recommendations for SuperV drills

Feed column										
Code-letter	A	B	C	D	E	F	G	H	I	
Drill-Ø mm	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

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

K, P, K/P
Since our new carbide grades are universally applicable we now define our carbide application groups as K or K/P only.

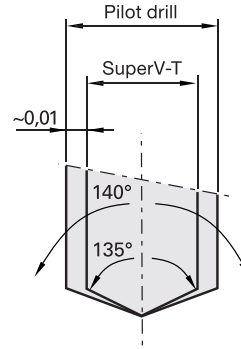
Generally recommendations:

For safety reasons it is very important, that a drill does not exceed a speed of $n = 6.000 \text{ rev./min}$ when unsupported. The centrifugal forces can break these long tools before reaching the workpiece surface!

Application recommendations for SuperV-T-drills:

In order to achieve optimal machining results when producing deep holes, we recommend:

1. Production of a cylindrical pilot hole (tolerance F9) with a min. drilling depth of $1 \times D$ with our SuperV drill type U or VA (140° point angle, tolerance m7). Or alternatively the Pilot Drill-Mill cat. no. 54700
2. Entry in the pilot hole: speed approx. 300 rev./min, feed rate approx. 500 mm/min.
3. Setting of coolant pressure and speed.
4. Continuous drilling to complete hole depth without withdrawing.
5. For through holes with plain - i.e. 90° - exit, reduce feed rate v_f to 50 % approx. 1 mm prior to break-through.
6. For through holes with oblique exit, reduce the feed rate v_f to 40% approx. 1 mm prior to break-through.
7. After reaching hole depth stop machine spindle and coolant supply, withdrawal with max. 5000 mm/min.



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/mm ²)	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		■
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		■
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		■
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		■
Unalloyed case hardened steels	1.0301 (C10), 1.1121 C10E (Ck10)	≤750		■
Alloyed case hardened steels	1.7043 38Cr4 1.5752 15NiCr13 (15NiCr13), 1.7131 16MnCr5, 1.7264 20CrMo5	850-≤1000 1000-1200		■ ■
Nitriding steels	1.8504 34CrAl6 1.8519 31CrMoV9, 1.8550 34CrAlNi7	≥850-≤1000 >1000-1200		■ ■
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		■ ■
High speed steels	1.3243 S 6-5-2-5, 1.3343 S 6-5-2, 1.3344 S 6-5-3	≥650-1000		■
Spring steels	1.5026 55Si7, 1.7176 55Cr3, 1.8159 51CrV4 (51CrV4)		≤330 HB	■ ■
Hardened steels	-		≤40-48 HRC >48-60 HRC	■ ■
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		■ ■ ■
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		■ □
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	■ ■
Chilled cast iron	-		≤350 HB	■
New Cast iron GGV	EN-GJV250 (GGV25), EN-GJV350 (GGV35) EN-GJV400 (GGV40), EN-GJV500 (GGV50), SiMo6			■ □
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		■ □
Special alloys	Nimonic, Inconel, Monel, Hastelloy	≤1200		■
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		■ ■
Aluminium and Al-alloys	3.0255 Al99.5, 3.2315 AlMgSi1, 3.3515 AlMg1	≤400		■
Al wrought alloys	3.0615 AlMgSiPb, 3.1325 AlCuMg1, 3.3245 AlMg3Si, 3.4365 AlZnMgCu1.5	≤450		■
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		■ ■
Magnesium alloys	3.5200 MgMn2, 3.5812.05 G-MgAl8Zn1, 3.5612.05 G-MgAl6Zn1	≤450		□
Copper, low alloyed	2.0070 SE-Cu, 2.1020 CuSn6, 2.1096 G-CuSn5ZnPb	≤400		■ ■
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		■ ■ ■
Bronze, short-chipping	2.1090 CuSn7ZnPb, 2.1170 CuPb5Sn5, 2.1176 CuPb10Sn 2.0790 CuNi18Zn19Pb	≤600 >600-850		■ ■
Bronze, long-chipping	2.0916 CuAl5, 2.0960 CuAl9Mn, 2.1050 CuSn10 2.0980 CuAl11Ni, 2.1247 CuBe2	≤850 >850-1000		■ ■
Duroplastics	Epoxy resin, Resopal, Pertinax, Moltopren			- □
Thermoplastics	Plexiglass, Hostalen, Novodur, Makralon			- ■ □
Kevlar	Kevlar			- □
Glass/carbon-concentr. plastics	GFK/CFK			- □

≤15×D

≤20×D

≤25×D

≤30×D

≤40×D

Catalog no.	51764
Tool material	STC
Carbide grade	K/P
Surface finish	AlTiN
DIN/Form	Stock
Type	T
Coolant	axial
Page	97

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Tool material	STC
Carbide grade	K/P
Surface finish	AlTiN
DIN/Form	Stock
Type	T
Coolant	axial
Page	99

Catalog no.	51767
Tool material	STC
Carbide grade	K/P
Surface finish	AlTiN
DIN/Form	Stock
Type	T
Coolant	axial
Page	100

Catalog no.	51768
Tool material	STC
Carbide grade	K/P
Surface finish	AlTiN
DIN/Form	Stock
Type	T
Coolant	axial
Page	101



V _c m/min	Feed no.	V _c m/min	Feed no.	V _c m/min	Feed no.	V _c m/min	Feed no.	V _c m/min	Feed no.
110	H	110	H	100	H	80	G	80	G
110	H	110	H	100	H	80	G	80	G
120	H	120	H	120	H	100	H	100	H
120	H	120	H	100	H	100	H	100	H
110	F	110	F	110	F	110	F	110	F
110	H	110	H	100	H	80	G	80	G
100	G	100	G	100	G	80	G	80	G
110	G	110	G	100	G	80	G	80	F-G
110	F	110	F	100	F	80	F	80	F
110	H	110	H	100	H	80	G	80	G
110	G	110	G	100	G	80	F	80	F
110	F	110	F	100	F	80	F	80	F
100	E	100	E	80	E	80	E	80	E
80	E	80	E	60	E	60	E	60	E
100	F-G	100	F	90	F	80	F	80	F-G
80	E	80	E	70	D	70	D	70	D
50	E	50	E	50	D	50	D	50	D
50	E	50	E	50	D	50	D	50	D
50	D	50	D	50	D	50	D	50	D
100	E	100	E	100	E	80	E	80	E
70	B-C	60	C	60	C	60	C	60	C
100	E	100	E	100	E	80	E	80	E
140	H	140	H	130	H	120	H	120	H
100	H	100	H	90	H	80	H	80	H
140	H	140	H	130	H	120	H	120	H
100	H	100	H	90	H	80	H	80	H
100	F	100	F	90	F	80	F	80	F
100	F	100	F	90	F	80	F	80	F
90	H	90	H	80	H	70	H	70	H
30	B	30	B	30	B	30	B	30	B
120	A	120	A	120	A	120	A	120	A
120	H	120	H	110	H	100	H	100	H