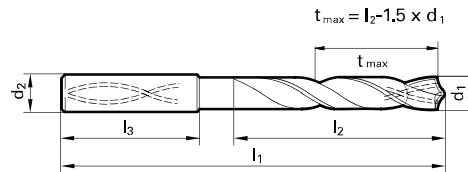




Tool material **Solid Carbide**
Surface **F**

- P** Steel ● web thinning ≥ Ø 3.000 • facet point grinding • main cutting edge form straight • optimized cutting geometry
 - M** Stainless steel ○
 - K** Cast iron ● structural and case hardened steels • free-cutting steels, heat treatable steels • steels (alloyed/unalloyed) up to 1200 N/mm² • cast materials • bronze, brass • high-alloyed AISi-alloys
 - N** Aluminum ○
 - S** Titanium alloys ○
 - H** Hardened steel ○
- =Optimal
○=Limited



Speeds and feeds information on pg. 551

Diameter (d ₁)		d ₂	l ₁	t _{max}	l ₂	EDP #	
inch	wire/ltr	mm	mm	mm	mm		
0.1181		3.00	6.00	70.00	25.50	30.00	9055120030000
0.1220		3.10	6.00	70.00	25.35	30.00	9055120031000
0.1248	1/8	3.18	6.00	70.00	25.23	30.00	9055120031700
0.1260		3.20	6.00	70.00	25.20	30.00	9055120032000
0.1280		3.25	6.00	70.00	25.13	30.00	9055120032500
0.1299		3.30	6.00	70.00	25.05	30.00	9055120033000
0.1339		3.40	6.00	75.00	30.40	35.50	9055120034000
0.1378		3.50	6.00	75.00	30.25	35.50	9055120035000
0.1406	9/64 #28	3.57	6.00	75.00	30.15	35.50	9055120035700
0.1417		3.60	6.00	75.00	30.10	35.50	9055120036000
0.1457		3.70	6.00	75.00	29.95	35.50	9055120037000
0.1496	#25	3.80	6.00	75.00	31.80	37.50	9055120038000
0.1535		3.90	6.00	75.00	31.65	37.50	9055120039000
0.1563	5/32	3.97	6.00	75.00	31.55	37.50	9055120039700
0.1575		4.00	6.00	75.00	31.50	37.50	9055120040000
0.1591	#21	4.04	6.00	75.00	31.44	37.50	9055120040400
0.1614		4.10	6.00	75.00	31.35	37.50	9055120041000
0.1654		4.20	6.00	75.00	31.20	37.50	9055120042000
0.1693	#18	4.30	6.00	85.00	38.55	45.00	9055120043000
0.1720	11/64	4.37	6.00	85.00	38.45	45.00	9055120043700
0.1732		4.40	6.00	85.00	38.40	45.00	9055120044000
0.1772	#16	4.50	6.00	85.00	38.25	45.00	9055120045000
0.1811		4.60	6.00	85.00	38.10	45.00	9055120046000
0.1831		4.65	6.00	85.00	38.03	45.00	9055120046500
0.1850	#13	4.70	6.00	85.00	37.95	45.00	9055120047000
0.1874	3/16	4.76	6.00	90.00	42.86	50.00	9055120047600
0.1890	#12	4.80	6.00	90.00	42.80	50.00	9055120048000
0.1929		4.90	6.00	90.00	42.65	50.00	9055120049000
0.1969		5.00	6.00	90.00	42.50	50.00	9055120050000
0.2008		5.10	6.00	90.00	42.35	50.00	9055120051000
0.2012	#7	5.11	6.00	90.00	42.34	50.00	9055120051100
0.2031	13/64	5.16	6.00	90.00	42.26	50.00	9055120051600
0.2047		5.20	6.00	90.00	42.20	50.00	9055120052000
0.2067		5.25	6.00	90.00	42.13	50.00	9055120052500
0.2087		5.30	6.00	90.00	42.05	50.00	9055120053000
0.2126		5.40	6.00	97.00	48.90	57.00	9055120054000
0.2130	#3	5.41	6.00	97.00	48.89	57.00	9055120054100
0.2165		5.50	6.00	97.00	48.75	57.00	9055120055000
0.2189	7/32	5.56	6.00	97.00	48.66	57.00	9055120055600
0.2205		5.60	6.00	97.00	48.60	57.00	9055120056000
0.2244		5.70	6.00	97.00	48.45	57.00	9055120057000
0.2283		5.80	6.00	97.00	48.30	57.00	9055120058000

Diameter (d ₁)		d ₂	l ₁	t _{max}	l ₂	EDP #	
inch	wire/ltr	mm	mm	mm	mm		
0.2323		5.90	6.00	97.00	48.15	57.00	9055120059000
0.2343	15/64	5.95	6.00	97.00	48.08	57.00	9055120059500
0.2362		6.00	6.00	97.00	48.00	57.00	9055120060000
0.2402		6.10	8.00	106.00	56.85	66.00	9055120061000
0.2441		6.20	8.00	106.00	56.70	66.00	9055120062000
0.2480		6.30	8.00	106.00	56.55	66.00	9055120063000
0.2500	1/4 E	6.35	8.00	106.00	56.48	66.00	9055120063500
0.2520		6.40	8.00	106.00	56.40	66.00	9055120064000
0.2559		6.50	8.00	106.00	56.25	66.00	9055120065000
0.2571	F	6.53	8.00	106.00	56.21	66.00	9055120065300
0.2598		6.60	8.00	106.00	56.10	66.00	9055120066000
0.2638		6.70	8.00	106.00	55.95	66.00	9055120067000
0.2657	17/64 H	6.75	8.00	106.00	55.88	66.00	9055120067500
0.2677		6.80	8.00	106.00	55.80	66.00	9055120068000
0.2717	I	6.90	8.00	116.00	65.65	76.00	9055120069000
0.2756		7.00	8.00	116.00	65.50	76.00	9055120070000
0.2795		7.10	8.00	116.00	65.35	76.00	9055120071000
0.2811	9/32 K	7.14	8.00	116.00	65.29	76.00	9055120071400
0.2835		7.20	8.00	116.00	65.20	76.00	9055120072000
0.2874		7.30	8.00	116.00	65.05	76.00	9055120073000
0.2913		7.40	8.00	116.00	64.90	76.00	9055120074000
0.2953		7.50	8.00	116.00	64.75	76.00	9055120075000
0.2969	19/64	7.54	8.00	116.00	64.69	76.00	9055120075400
0.2992		7.60	8.00	116.00	64.60	76.00	9055120076000
0.3031		7.70	8.00	116.00	64.45	76.00	9055120077000
0.3071		7.80	8.00	116.00	64.30	76.00	9055120078000
0.3110		7.90	8.00	116.00	64.15	76.00	9055120079000
0.3125	5/16	7.94	8.00	116.00	64.09	76.00	9055120079400
0.3150		8.00	8.00	116.00	64.00	76.00	9055120080000
0.3189		8.10	10.00	131.00	74.85	87.00	9055120081000
0.3228	P	8.20	10.00	131.00	74.70	87.00	9055120082000
0.3268		8.30	10.00	131.00	74.55	87.00	9055120083000
0.3280	21/64	8.33	10.00	131.00	74.51	87.00	9055120083300
0.3307		8.40	10.00	131.00	74.40	87.00	9055120084000
0.3346		8.50	10.00	131.00	74.25	87.00	9055120085000
0.3386		8.60	10.00	131.00	74.10	87.00	9055120086000
0.3425		8.70	10.00	131.00	73.95	87.00	9055120087000
0.3437	11/32	8.73	10.00	131.00	73.91	87.00	9055120087300
0.3465		8.80	10.00	131.00	73.80	87.00	9055120088000
0.3504		8.90	10.00	131.00	73.65	87.00	9055120089000
0.3543		9.00	10.00	131.00	73.50	87.00	9055120090000
0.3583		9.10	10.00	139.00	81.35	95.00	9055120091000

7xD Drills

Diameter (d ₁)			d ₂	l ₁	t _{max}	l ₂	EDP #
inch	wire/ltr	mm	mm	mm	mm	mm	
0.3594	23/64	9.13	10.00	139.00	81.31	95.00	9055120091300
0.3622		9.20	10.00	139.00	81.20	95.00	9055120092000
0.3642		9.25	10.00	139.00	81.13	95.00	9055120092500
0.3661		9.30	10.00	139.00	81.05	95.00	9055120093000
0.3677	U	9.34	10.00	139.00	80.99	95.00	9055120093400
0.3701		9.40	10.00	139.00	80.90	95.00	9055120094000
0.3740		9.50	10.00	139.00	80.75	95.00	9055120095000
0.3750	3/8	9.52	10.00	139.00	80.72	95.00	9055120095200
0.3780		9.60	10.00	139.00	80.60	95.00	9055120096000
0.3819		9.70	10.00	139.00	80.45	95.00	9055120097000
0.3858	W	9.80	10.00	139.00	80.30	95.00	9055120098000
0.3898		9.90	10.00	139.00	80.15	95.00	9055120099000
0.3906	25/64	9.92	10.00	139.00	80.12	95.00	9055120099200
0.3937		10.00	10.00	139.00	80.00	95.00	9055120100000
0.3976		10.10	12.00	155.00	90.85	106.00	9055120101000
0.4016		10.20	12.00	155.00	90.70	106.00	9055120102000
0.4055		10.30	12.00	155.00	90.55	106.00	9055120103000
0.4063	13/32	10.32	12.00	155.00	90.52	106.00	9055120103200
0.4094		10.40	12.00	155.00	90.40	106.00	9055120104000
0.4134		10.50	12.00	155.00	90.25	106.00	9055120105000
0.4173		10.60	12.00	155.00	90.10	106.00	9055120106000
0.4213		10.70	12.00	155.00	89.95	106.00	9055120107000
0.4220	27/64	10.72	12.00	155.00	89.92	106.00	9055120107200
0.4252		10.80	12.00	155.00	89.80	106.00	9055120108000
0.4291		10.90	12.00	155.00	89.65	106.00	9055120109000
0.4331		11.00	12.00	155.00	89.50	106.00	9055120110000
0.4370		11.10	12.00	163.00	97.35	114.00	9055120111000
0.4374	7/16	11.11	12.00	163.00	97.34	114.00	9055120111100
0.4409		11.20	12.00	163.00	97.20	114.00	9055120112000
0.4449		11.30	12.00	163.00	97.05	114.00	9055120113000
0.4488		11.40	12.00	163.00	96.90	114.00	9055120114000
0.4528		11.50	12.00	163.00	96.75	114.00	9055120115000
0.4531	29/64	11.51	12.00	163.00	96.74	114.00	9055120115100
0.4567		11.60	12.00	163.00	96.60	114.00	9055120116000
0.4606		11.70	12.00	163.00	96.45	114.00	9055120117000
0.4646		11.80	12.00	163.00	96.30	114.00	9055120118000

Diameter (d ₁)			d ₂	l ₁	t _{max}	l ₂	EDP #
inch	wire/ltr	mm	mm	mm	mm	mm	
0.4685		11.90	12.00	163.00	96.15	114.00	9055120119000
0.4689	15/32	11.91	12.00	163.00	96.14	114.00	9055120119100
0.4724		12.00	12.00	163.00	96.00	114.00	9055120120000
0.4764		12.10	14.00	182.00	114.85	133.00	9055120121000
0.4803		12.20	14.00	182.00	114.70	133.00	9055120122000
0.4843	31/64	12.30	14.00	182.00	114.55	133.00	9055120123000
0.4921		12.50	14.00	182.00	114.25	133.00	9055120125000
0.5000	1/2	12.70	14.00	182.00	113.95	133.00	9055120127000
0.5118		13.00	14.00	182.00	113.50	133.00	9055120130000
0.5157	33/64	13.10	14.00	182.00	113.35	133.00	9055120131000
0.5311	17/32	13.49	14.00	182.00	112.77	133.00	9055120134900
0.5315		13.50	14.00	182.00	112.75	133.00	9055120135000
0.5469	35/64	13.89	14.00	182.00	112.17	133.00	9055120138900
0.5512		14.00	14.00	182.00	112.00	133.00	9055120140000
0.5551		14.10	16.00	204.00	130.85	152.00	9055120141000
0.5591		14.20	16.00	204.00	130.70	152.00	9055120142000
0.5626	9/16	14.29	16.00	204.00	130.57	152.00	9055120142900
0.5709		14.50	16.00	204.00	130.25	152.00	9055120145000
0.5906		15.00	16.00	204.00	129.50	152.00	9055120150000
0.5945		15.10	16.00	204.00	129.35	152.00	9055120151000
0.6094	39/64	15.48	16.00	204.00	128.78	152.00	9055120154800
0.6102		15.50	16.00	204.00	128.75	152.00	9055120155000
0.6250	5/8	15.87	16.00	204.00	128.20	152.00	9055120158700
0.6299		16.00	16.00	204.00	128.00	152.00	9055120160000
0.6496		16.50	18.00	223.00	146.25	171.00	9055120165000
0.6563	21/32	16.67	18.00	223.00	146.00	171.00	9055120166700
0.6654		16.90	18.00	223.00	145.65	171.00	9055120169000
0.6693		17.00	18.00	223.00	145.50	171.00	9055120170000
0.6890		17.50	18.00	223.00	144.75	171.00	9055120175000
0.7087		18.00	18.00	223.00	144.00	171.00	9055120180000
0.7283		18.50	20.00	244.00	162.25	190.00	9055120185000
0.7441		18.90	20.00	244.00	161.65	190.00	9055120189000
0.7480		19.00	20.00	244.00	161.50	190.00	9055120190000
0.7500	3/4	19.05	20.00	244.00	161.43	190.00	9055120190500
0.7677		19.50	20.00	244.00	160.75	190.00	9055120195000
0.7874		20.00	20.00	244.00	160.00	190.00	9055120200000

Material group	Hardness		SFM	Feed Rate - IPR									
	HRc	Bhn		1/16 in. 1.590 mm	1/8 in. 3.170 mm	1/4 in. 6.350 mm	3/8 in. 9.520 mm	1/2 in. 12.700 mm	5/8 in. 15.870 mm	3/4 in. 19.050 mm	1 in. 25.400 mm	1 1/4 in. 31.750 mm	1 1/2 in. 38.100 mm
Common structural steels	- ≤ 32	≤ 150 ≤ 301	460 395		0.0050 0.0040	0.0080 0.0065	0.0100 0.0080	0.0125 0.0100	0.0125 0.0100	0.0140 0.0110	0.0160 0.0125		
Free-cutting steels	≤ 25 ≤ 32	≤ 255 ≤ 301	550 480		0.0065 0.0065	0.0100 0.0100	0.0125 0.0125	0.0160 0.0160	0.0160 0.0160	0.0180 0.0180	0.0200 0.0200		
Unalloyed heat-treatable steels	≤ 20 ≤ 25 ≤ 32	≤ 220 ≤ 255 ≤ 301	415 400 395		0.0065 0.0050 0.0050	0.0100 0.0080 0.0080	0.0125 0.0100 0.0100	0.0160 0.0125 0.0125	0.0160 0.0125 0.0125	0.0180 0.0140 0.0140	0.0200 0.0160 0.0160		
Alloyed heat-treatable steels	≤ 32 ≤ 43	≤ 301 ≤ 402	395 335		0.0050 0.0050	0.0080 0.0080	0.0100 0.0100	0.0125 0.0125	0.0125 0.0125	0.0140 0.0140	0.0160 0.0160		
Unalloyed case hardened steels	≤ 25	≤ 255	465		0.0065	0.0100	0.0125	0.0160	0.0160	0.0180	0.0200		
Alloyed case hardened steels	≤ 32 ≤ 43	≤ 301 ≤ 402	395 270		0.0050 0.0030	0.0080 0.0050	0.0100 0.0065	0.0125 0.0080	0.0125 0.0080	0.0140 0.0090	0.0160 0.0100		
Nitriding steels	≤ 32 ≤ 43	≤ 301 ≤ 402	340 325		0.0050 0.0040	0.0080 0.0065	0.0100 0.0080	0.0125 0.0100	0.0125 0.0100	0.0140 0.0110	0.0160 0.0125		
Tool steels	≤ 25 ≤ 43	≤ 255 ≤ 402	230 175		0.0040 0.0030	0.0065 0.0050	0.0080 0.0065	0.0100 0.0080	0.0100 0.0080	0.0110 0.0090	0.0125 0.0100		
High speed steels	≤ 43	≤ 402	195		0.0025	0.0040	0.0050	0.0065	0.0065	0.0070	0.0080		
Spring steels	≤ 38	≤ 354	195		0.0020	0.0030	0.0040	0.0050	0.0050	0.0055	0.0065		
Hardened steels	≤ 48 ≤ 66	≤ 460 -	175 110		0.0020 0.0020	0.0030 0.0030	0.0040 0.0040	0.0050 0.0050	0.0050 0.0050	0.0055 0.0055	0.0065 0.0065		
Stainless steels, sulphured austenitic martensitic	≤ 28 ≤ 36 ≤ 46	≤ 273 ≤ 337 ≤ 435	195 175 155		0.0030 0.0030 0.0030	0.0050 0.0050 0.0050	0.0065 0.0065 0.0065	0.0080 0.0080 0.0080	0.0080 0.0080 0.0080	0.0090 0.0090 0.0090	0.0100 0.0100 0.0100		
Cast iron	≤ 23 ≤ 38	≤ 242 ≤ 354	640 525		0.0080 0.0080	0.0125 0.0125	0.0160 0.0160	0.0200 0.0200	0.0200 0.0200	0.0220 0.0220	0.0245 0.0245		
Spheroidal graphite iron and malleable cast iron	≤ 23 ≤ 38	≤ 242 ≤ 354	435 415		0.0080 0.0065	0.0125 0.0100	0.0160 0.0125	0.0200 0.0160	0.0200 0.0160	0.0220 0.0180	0.0245 0.0200		
Chilled cast iron	≤ 38	≤ 354	130		0.0020	0.0030	0.0040	0.0050	0.0050	0.0055	0.0065		
New cast materials GGV	≤ 20 ≤ 32	≤ 220 ≤ 301											
New cast materials ADI	≤ 32 ≤ 43	≤ 301 ≤ 402											
Special alloys	≤ 54	≤ 549	110		0.0025	0.0040	0.0050	0.0065	0.0065	0.0070	0.0080		
Ti and Ti-alloys	≤ 25 ≤ 43	≤ 255 ≤ 402	140 130		0.0020 0.0020	0.0030 0.0030	0.0040 0.0040	0.0050 0.0050	0.0050 0.0050	0.0055 0.0055	0.0065 0.0065		
Aluminium and Al-alloys	-	≤ 120	1000		0.0080	0.0125	0.0160	0.0200	0.0200	0.0220	0.0245		
Al wrought alloys	-	≤ 200	1000		0.0080	0.0125	0.0160	0.0200	0.0200	0.0220	0.0245		
Al cast alloys ≤ 10 % Si ≤ 24 % Si	-	≤ 180 ≤ 180	845 710		0.0080 0.0080	0.0125 0.0125	0.0160 0.0160	0.0200 0.0200	0.0200 0.0200	0.0220 0.0220	0.0245 0.0245		
Magnesium alloys	-	≤ 120	900		0.0065	0.0100	0.0125	0.0160	0.0160	0.0180	0.0200		
Copper, low-alloyed	-	≤ 150	400		0.0065	0.0100	0.0125	0.0160	0.0160	0.0180	0.0200		
Brass, short-chipping long-chipping	- -	≤ 180 ≤ 180	1050 710		0.0080 0.0065	0.0125 0.0100	0.0160 0.0125	0.0200 0.0160	0.0200 0.0160	0.0220 0.0180	0.0245 0.0200		
Bronze, short-chipping	-	≤ 180	410		0.0065	0.0100	0.0125	0.0160	0.0160	0.0180	0.0200		
Bronze, long-chipping	≤ 25 ≤ 32	≤ 255 ≤ 301	345 250		0.0050 0.0050	0.0080 0.0080	0.0100 0.0100	0.0125 0.0125	0.0125 0.0125	0.0140 0.0140	0.0160 0.0160		
Duroplastics Thermoplastics Reinforced plastics - Kevlar Reinforced plastics - GFK / CFK													

Material group	Hardness		SFM	Feed Rate - IPR									
	HRc	Bhn		1/16 in. 1.590 mm	1/8 in. 3.170 mm	1/4 in. 6.350 mm	3/8 in. 9.520 mm	1/2 in. 12.700 mm	5/8 in. 15.870 mm	3/4 in. 19.050 mm	1 in. 25.400 mm	1 1/4 in. 31.750 mm	1 1/2 in. 38.100 mm
Common structural steels	- ≤ 32	≤ 150 ≤ 301											
Free-cutting steels	≤ 25 ≤ 32	≤ 255 ≤ 301											
Unalloyed heat-treatable steels	≤ 20 ≤ 25 ≤ 32	≤ 220 ≤ 255 ≤ 301											
Alloyed heat-treatable steels	≤ 32 ≤ 43	≤ 301 ≤ 402											
Unalloyed case hardened steels	≤ 25	≤ 255											
Alloyed case hardened steels	≤ 32 ≤ 43	≤ 301 ≤ 402											
Nitriding steels	≤ 32 ≤ 43	≤ 301 ≤ 402											
Tool steels	≤ 25 ≤ 43	≤ 255 ≤ 402											
High speed steels	≤ 43	≤ 402											
Spring steels	≤ 38	≤ 354											
Cast iron	≤ 23 ≤ 38	≤ 242 ≤ 354	395 330		0.0040 0.0040	0.0065 0.0065	0.0080 0.0080	0.0100 0.0100	0.0100 0.0100	0.0110 0.0110			
Spheroidal graphite iron and malleable cast iron	≤ 23 ≤ 38	≤ 242 ≤ 354	295 260		0.0040 0.0040	0.0065 0.0065	0.0080 0.0080	0.0100 0.0100	0.0100 0.0100	0.0110 0.0110			
Chilled cast iron	≤ 38	≤ 354	130		0.0020	0.0030	0.0040	0.0050	0.0055	0.0065			
New cast materials GGV	≤ 20 ≤ 32	≤ 220 ≤ 301											
New cast materials ADI	≤ 32 ≤ 43	≤ 301 ≤ 402											
Special alloys	≤ 54	≤ 549											
Ti and Ti-alloys	≤ 25 ≤ 43	≤ 255 ≤ 402											
Aluminium and Al-alloys	-	≤ 120	1345		0.0065	0.0100	0.0125	0.0160	0.0180	0.0200			
Al wrought alloys	-	≤ 200	1345		0.0065	0.0100	0.0125	0.0160	0.0180	0.0200			
Al cast alloys ≤ 10 % Si ≤ 24 % Si	-	≤ 180 ≤ 180	1245 1080		0.0065 0.0065	0.0100 0.0100	0.0125 0.0125	0.0160 0.0160	0.0180 0.0180	0.0200 0.0200			
Magnesium alloys	-	≤ 120											
Copper, low-alloyed	-	≤ 150											
Brass, short-chipping long-chipping	- -	≤ 180 ≤ 180	920		0.0050	0.0080	0.0100	0.0125	0.0125	0.0140			
Bronze, short-chipping	-	≤ 180	360		0.0040	0.0065	0.0080	0.0100	0.0100	0.0110			
Bronze, long-chipping	≤ 25 ≤ 32	≤ 255 ≤ 301	260		0.0030	0.0050	0.0065	0.0080	0.0080	0.0090			
Duroplastics Thermoplastics Reinforced plastics - Kevlar Reinforced plastics - GFK / CFK													

Note: Pilot holes (depth >1xD) are recommended when drilling depths greater than 7xD. The pilot hole can be produced with a short, rigid drill. The diameter should be 0.01 - 0.02 mm larger than the diameter of the finish drill. Ratio drills can produce their own pilot hole by reducing speed and feed rates by 30-40%.