

Tool material

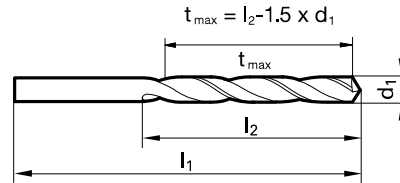
Solid Carbide

Surface



P Steel	•	web thinning $\geq \varnothing 3.17$ • relieved cone • wide flutes • especially for drilling depths > 3xD
M Stainless steel		
K Cast iron	•	grey cast iron • steels up to 1000 N/mm ² • Not recommended for: CrNi steels, stainless steels
N Aluminum	•	
S Titanium alloys		
H Hardened steel		

•=Optimal
○=Limited



Speeds and feeds information on pg. 540

Shank diameter = cut diameter

5xD Drills

Diameter (d ₁)			l ₁ mm	t _{max} mm	l ₂ mm	EDP #
inch	wire/ltr	mm				
0.1248	1/8	3.17	70.70	37.05	41.80	9026020031700
0.1260		3.20	70.70	37.00	41.80	9026020032000
0.1283	#30	3.26	70.70	36.91	41.80	9026020032600
0.1299		3.30	73.80	39.95	44.90	9026020033000
0.1339		3.40	73.80	39.80	44.90	9026020034000
0.1358	#29	3.45	73.80	39.73	44.90	9026020034500
0.1378		3.50	73.80	39.65	44.90	9026020035000
0.1406	9/64	3.57	73.80	39.55	44.90	9026020035700
0.1441	#27	3.66	76.90	43.31	48.80	9026020036600
0.1469	#26	3.73	76.90	43.21	48.80	9026020037300
0.1496	#25	3.80	76.90	43.10	48.80	9026020038000
0.1520	#24	3.86	80.00	46.11	51.90	9026020038600
0.1539	#23	3.91	80.00	46.04	51.90	9026020039100
0.1563	5/32	3.97	80.00	45.95	51.90	9026020039700
0.1571	#22	3.99	80.00	45.92	51.90	9026020039900
0.1575		4.00	84.00	49.00	55.00	9026020040000
0.1591	#21	4.04	84.00	48.94	55.00	9026020040400
0.1610	#20	4.09	84.00	48.87	55.00	9026020040900
0.1661	#19	4.22	84.00	48.67	55.00	9026020042200
0.1693	#18	4.30	84.00	48.55	55.00	9026020043000
0.1720	11/64	4.37	84.00	48.45	55.00	9026020043700
0.1728	#17	4.39	87.00	50.42	57.00	9026020043900
0.1772	#16	4.50	87.00	50.25	57.00	9026020045000
0.1799	#15	4.57	87.00	50.15	57.00	9026020045700
0.1819	#14	4.62	87.00	50.07	57.00	9026020046200
0.1850	#13	4.70	90.10	53.05	60.10	9026020047000
0.1874	3/16	4.76	90.10	52.96	60.10	9026020047600
0.1890	#12	4.80	90.10	52.90	60.10	9026020048000
0.1909	#11	4.85	90.10	52.83	60.10	9026020048500
0.1937	#10	4.92	93.20	55.82	63.20	9026020049200
0.1961	#9	4.98	93.20	55.73	63.20	9026020049800
0.1969		5.00	93.20	55.70	63.20	9026020050000
0.1992	#8	5.06	93.20	55.61	63.20	9026020050600
0.2012	#7	5.11	93.20	55.54	63.20	9026020051100
0.2031	13/64	5.16	93.20	55.46	63.20	9026020051600
0.2039	#6	5.18	96.30	57.43	65.20	9026020051800
0.2055	#5	5.22	96.30	57.37	65.20	9026020052200
0.2091	#4	5.31	96.30	57.24	65.20	9026020053100
0.2130	#3	5.41	96.30	57.09	65.20	9026020054100
0.2165		5.50	96.30	56.95	65.20	9026020055000
0.2189	7/32	5.56	96.30	56.86	65.20	9026020055600
0.2209	#2	5.61	99.40	59.89	68.30	9026020056100

Diameter (d ₁)			l ₁ mm	t _{max} mm	l ₂ mm	EDP #
inch	wire/ltr	mm				
0.2280	#1	5.79	99.40	59.62	68.30	9026020057900
0.2339	A	5.94	99.40	59.39	68.30	9026020059400
0.2343	15/64	5.95	99.40	59.38	68.30	9026020059500
0.2362		6.00	103.40	62.40	71.40	9026020060000
0.2378	B	6.04	103.40	62.34	71.40	9026020060400
0.2421	C	6.15	103.40	62.18	71.40	9026020061500
0.2461	D	6.25	103.40	62.03	71.40	9026020062500
0.2500	1/4	6.35	103.40	61.88	71.40	9026020063500
0.2559		6.50	106.60	64.85	74.60	9026020065000
0.2571	F	6.53	106.60	64.81	74.60	9026020065300
0.2610	G	6.63	106.60	64.66	74.60	9026020066300
0.2657	17/64	6.75	106.60	64.48	74.60	9026020067500
0.2717	I	6.90	106.60	64.25	74.60	9026020069000
0.2756		7.00	106.60	64.10	74.60	9026020070000
0.2768	J	7.03	106.60	64.06	74.60	9026020070300
0.2811	9/32	7.14	109.70	65.99	76.70	9026020071400
0.2902	L	7.37	109.70	65.65	76.70	9026020073700
0.2949	M	7.49	112.80	68.47	79.70	9026020074900
0.2953		7.50	112.80	68.45	79.70	9026020075000
0.2969	19/64	7.54	112.80	68.39	79.70	9026020075400
0.3020	N	7.67	112.80	68.20	79.70	9026020076700
0.3126	5/16	7.94	115.90	70.89	82.80	9026020079400
0.3150		8.00	115.90	70.80	82.80	9026020080000
0.3161	O	8.03	115.90	70.76	82.80	9026020080300
0.3228	P	8.20	119.00	73.70	86.00	9026020082000
0.3280	21/64	8.33	119.00	73.51	86.00	9026020083300
0.3319	Q	8.43	123.10	76.46	89.10	9026020084300
0.3346		8.50	123.10	76.35	89.10	9026020085000
0.3390	R	8.61	123.10	76.19	89.10	9026020086100
0.3437	11/32	8.73	123.10	76.01	89.10	9026020087300
0.3480	S	8.84	126.10	77.84	91.10	9026020088400
0.3543		9.00	126.10	77.60	91.10	9026020090000
0.3579	T	9.09	126.10	77.47	91.10	9026020090900
0.3594	23/64	9.13	126.10	77.41	91.10	9026020091300
0.3677	U	9.34	129.20	80.19	94.20	9026020093400
0.3740		9.50	129.20	79.95	94.20	9026020095000
0.3748	3/8	9.52	129.20	79.92	94.20	9026020095200
0.3772	V	9.58	129.20	79.83	94.20	9026020095800
0.3858	W	9.80	132.40	82.70	97.40	9026020098000
0.3906	25/64	9.92	132.40	82.52	97.40	9026020099200
0.3937		10.00	132.40	82.40	97.40	9026020100000
0.3969	X	10.08	132.40	82.28	97.40	9026020100800

Diameter (d ₁)			l ₁ mm	t _{max} mm	l ₂ mm	EDP #
inch	wire/ltr	mm				
0.4039	Y	10.26	135.50	85.11	100.50	9026020102600
0.4063	13/32	10.32	135.50	85.02	100.50	9026020103200
0.4130	Z	10.49	135.50	84.77	100.50	9026020104900
0.4134		10.50	135.50	84.75	100.50	9026020105000
0.4220	27/64	10.72	139.40	86.42	102.50	9026020107200
0.4331		11.00	142.50	89.10	105.60	9026020110000
0.4374	7/16	11.11	142.50	88.94	105.60	9026020111100

Diameter (d ₁)			l ₁ mm	t _{max} mm	l ₂ mm	EDP #
inch	wire/ltr	mm				
0.4528		11.50	145.60	91.45	108.70	9026020115000
0.4531	29/64	11.51	145.60	91.44	108.70	9026020115100
0.4689	15/32	11.91	148.80	94.84	112.70	9026020119100
0.4724		12.00	151.90	95.90	113.90	9026020120000
0.4843	31/64	12.30	151.90	95.45	113.90	9026020123000
0.4921		12.50	155.10	98.35	117.10	9026020125000
0.5000	1/2	12.70	155.10	98.05	117.10	9026020127000

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	235		0,0040	0,0065	0,0080	0,0100					
Unalloyed heat-treatable steels	≤ 20 ≤ 25 ≤ 32	≤ 220 ≤ 255 ≤ 301	210 120		0,0040 0,0030	0,0065 0,0050	0,0080 0,0065	0,0100 0,0080					
Alloyed heat-treatable steels	≤ 32 ≤ 43	≤ 301 ≤ 402	145 120		0,0030 0,0025	0,0050 0,0040	0,0065 0,0050	0,0080 0,0065					
Unalloyed case hardened steels	≤ 25	≤ 255											
Alloyed case hardened steels	≤ 32 ≤ 43	≤ 301 ≤ 402	130 100		0,0030 0,0025	0,0050 0,0040	0,0065 0,0050	0,0080 0,0065					
Nitriding steels	≤ 32 ≤ 43	≤ 301 ≤ 402	120 85		0,0030 0,0025	0,0050 0,0040	0,0065 0,0050	0,0080 0,0065					
Tool steels	≤ 25 ≤ 43	≤ 255 ≤ 402	145 85		0,0030 0,0025	0,0050 0,0040	0,0065 0,0050	0,0080 0,0065					
High speed steels	≤ 43	≤ 402	85		0,0025	0,0040	0,0050	0,0065					
Spring steels	≤ 38	≤ 354											
Hardened steels	≤ 48 ≤ 66	≤ 460 -											
Stainless steels, sulphured austenitic martensitic	≤ 28 ≤ 36 ≤ 46	≤ 273 ≤ 337 ≤ 435	120 100		0,0030 0,0025	0,0050 0,0040	0,0065 0,0050	0,0080 0,0065					
Cast iron	≤ 23 ≤ 38	≤ 242 ≤ 354	295 235		0,0050 0,0050	0,0080 0,0080	0,0100 0,0100	0,0125 0,0125					
Spheroidal graphite iron and malleable cast iron	≤ 23 ≤ 38	≤ 242 ≤ 354	260 185		0,0050 0,0050	0,0080 0,0080	0,0100 0,0100	0,0125 0,0125					
Chilled cast iron	≤ 38	≤ 354	60		0,0025	0,0040	0,0050	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											
Al wrought alloys	-	≤ 200											
Al cast alloys ≤ 10 % Si ≤ 24 % Si	- -	≤ 180 ≤ 180	560 460		0,0065 0,0040	0,0100 0,0065	0,0125 0,0080	0,0160 0,0100					
Magnesium alloys	-	≤ 120											
Copper, low-alloyed	-	≤ 150	295		0,0040	0,0065	0,0080	0,0100					
Brass, short-chipping long-chipping	- -	≤ 180 ≤ 180	340		0,0065	0,0080	0,0100	0,0100					
Bronze, short-chipping	-	≤ 180											
Bronze, long-chipping	≤ 25 ≤ 32	≤ 255 ≤ 301	235 185		0,0030 0,0030	0,0050 0,0050	0,0065 0,0065	0,0080 0,0080					
Duroplastics Thermoplastics Reinforced plastics - Kevlar Reinforced plastics - GFK / CFK			145		0,0030	0,0050	0,0065	0,0080					

Material group	Hardness		SFM	Feed Rate - IPR					
	HRc	Bhn		≤16.000 mm	41/64 - 25/32 in. 16.001 - 20.000 mm	51/64 - 31/32 in. 20.001 - 25.000 mm	63/64 - 1 17/64 in. 25.001 - 31.500 mm	1 1/4 - 1 9/16 in. 31.501 - 40.000 mm	1 37/64 - 1 61/64 in. 40.001 - 50.000 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	325 260	0,0125 0,0125	0,0160 0,0160	0,0200 0,0200	0,0200 0,0200	0,0250 0,0250	0,0315 0,0315
Spheroidal graphite iron and malleable cast iron	≤ 23 ≤ 38	≤ 242 ≤ 354	260 230	0,0125 0,0100	0,0160 0,0125	0,0200 0,0160	0,0200 0,0160	0,0250 0,0200	0,0315 0,0250
Chilled cast iron	≤ 38	≤ 354	35	0,0040	0,0050	0,0065	0,0065	0,0080	0,0100
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	660	0,0125	0,0160	0,0200	0,0200	0,0250	0,0315
Al wrought alloys	-	≤ 200	595	0,0125	0,0160	0,0200	0,0200	0,0250	0,0315
Al cast alloys ≤ 10 % Si ≤ 24 % Si	- -	≤ 180 ≤ 180	490 390	0,0125 0,0125	0,0160 0,0160	0,0200 0,0200	0,0200 0,0200	0,0250 0,0250	0,0315 0,0315
Magnesium alloys	-	≤ 120	590	0,0125	0,0160	0,0200	0,0200	0,0250	0,0315
Copper, low-alloyed	-	≤ 150	225	0,0100	0,0125	0,0160	0,0160	0,0200	0,0250
Brass, short-chipping long-chipping	- -	≤ 180 ≤ 180	585 390	0,0125 0,0100	0,0160 0,0125	0,0200 0,0160	0,0200 0,0160	0,0250 0,0200	0,0315 0,0250
Bronze, short-chipping	-	≤ 180	230	0,0100	0,0125	0,0160	0,0160	0,0200	0,0250
Bronze, long-chipping	≤ 25 ≤ 32	≤ 255 ≤ 301	160 115	0,0100 0,0080	0,0125 0,0100	0,0160 0,0125	0,0160 0,0125	0,0200 0,0160	0,0250 0,0200
Duroplastics Thermoplastics Reinforced plastics - Kevlar Reinforced plastics - GFK / CFK			165 165 165 165	0,0080 0,0080 0,0080 0,0080	0,0100 0,0100 0,0100 0,0100	0,0125 0,0125 0,0125 0,0125	0,0125 0,0125 0,0125 0,0125	0,0160 0,0160 0,0160 0,0160	0,0200 0,0200 0,0200 0,0200