



Tool material

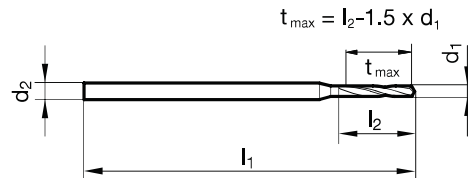
Solid Carbide

Surface



P Steel	•	web thinning $\geq \varnothing 0.500$ • facet point grinding • main cutting edge form straight • edge preparation
M Stainless steel	•	
K Cast iron	•	structural and case hardened steels • free-cutting steels, heat-treatable steels • alloyed steels up to 1200 N/mm ² • stainless steels • cast materials
N Aluminum	○	
S Titanium alloys	○	
H Hardened steel		

•=Optimal
○=Limited



Speeds and feeds information on pg. 566

Diameter (d ₁)			d2 h6	l ₁	t _{max}	l ₂	EDP #
inch	wire/ltr	mm	mm	mm	mm	mm	
0.0197		0.50	3.00	47.00	2.40	3.00	9064000005000
0.0217		0.55	3.00	47.00	2.60	3.30	9064000005500
0.0236		0.60	3.00	47.00	2.90	3.60	9064000006000
0.0256		0.65	3.00	47.00	3.10	3.90	9064000006500
0.0276		0.70	3.00	47.00	3.30	4.20	9064000007000
0.0295		0.75	3.00	47.00	3.60	4.50	9064000007500
0.0315		0.80	3.00	47.00	3.80	4.80	9064000008000
0.0335		0.85	3.00	47.00	4.10	5.10	9064000008500
0.0354		0.90	3.00	47.00	4.30	5.40	9064000009000
0.0374		0.95	3.00	47.00	4.50	5.70	9064000009500
0.0394		1.00	3.00	47.00	4.80	6.00	9064000010000
0.0413		1.05	3.00	47.00	5.00	6.30	9064000010500
0.0433		1.10	3.00	47.00	5.30	6.60	9064000011000
0.0453		1.15	3.00	47.00	5.50	6.90	9064000011500
0.0472		1.20	3.00	47.00	5.70	7.20	9064000012000
0.0492		1.25	3.00	47.00	6.00	7.50	9064000012500
0.0512		1.30	3.00	47.00	6.20	7.80	9064000013000
0.0531		1.35	3.00	47.00	6.40	8.10	9064000013500
0.0551	#54	1.40	3.00	47.00	6.70	8.40	9064000014000
0.0571		1.45	3.00	47.00	6.90	8.70	9064000014500
0.0591		1.50	3.00	47.00	7.20	9.00	9064000015000
0.0610		1.55	3.00	47.00	7.40	9.30	9064000015500
0.0626	1/16	1.59	3.00	47.00	7.70	9.60	9064000015900
0.0630		1.60	3.00	47.00	7.60	9.60	9064000016000
0.0650		1.65	3.00	47.00	7.90	9.90	9064000016500
0.0669	#51	1.70	3.00	47.00	8.10	10.20	9064000017000
0.0689		1.75	3.00	47.00	8.40	10.50	9064000017500
0.0709		1.80	3.00	52.00	8.60	10.80	9064000018000

Diameter (d ₁)			d2 h6	l ₁	t _{max}	l ₂	EDP #
inch	wire/ltr	mm	mm	mm	mm	mm	
0.0728	#49	1.85	3.00	52.00	8.80	11.10	9064000018500
0.0748		1.90	3.00	52.00	9.10	11.40	9064000019000
0.0768		1.95	3.00	52.00	9.30	11.70	9064000019500
0.0780	5/64	1.98	4.00	59.00	9.60	12.00	9064000019800
0.0787		2.00	4.00	59.00	9.60	12.00	9064000020000
0.0807		2.05	4.00	59.00	9.80	12.30	9064000020500
0.0827		2.10	4.00	59.00	10.00	12.60	9064000021000
0.0846		2.15	4.00	59.00	10.30	12.90	9064000021500
0.0866		2.20	4.00	59.00	10.50	13.20	9064000022000
0.0886		2.25	4.00	59.00	10.70	13.50	9064000022500
0.0906		2.30	4.00	59.00	11.00	13.80	9064000023000
0.0925		2.35	4.00	59.00	11.20	14.10	9064000023500
0.0937	3/32	2.38	4.00	59.00	11.50	14.40	9064000023800
0.0945		2.40	4.00	59.00	11.50	14.40	9064000024000
0.0965		2.45	4.00	59.00	11.70	14.70	9064000024500
0.0984		2.50	4.00	59.00	11.90	15.00	9064000025000
0.1004		2.55	4.00	59.00	12.20	15.30	9064000025500
0.1024		2.60	4.00	59.00	12.40	15.60	9064000026000
0.1043		2.65	4.00	59.00	12.70	15.90	9064000026500
0.1063		2.70	4.00	59.00	12.90	16.20	9064000027000
0.1083		2.75	4.00	59.00	13.10	16.50	9064000027500
0.1094	7/64	2.78	4.00	59.00	13.40	16.80	9064000027800
0.1102		2.80	4.00	59.00	13.40	16.80	9064000028000
0.1122		2.85	4.00	59.00	13.60	17.10	9064000028500
0.1142		2.90	4.00	59.00	13.90	17.40	9064000029000
0.1161	#32	2.95	4.00	59.00	14.10	17.70	9064000029500
0.1181		3.00	4.00	59.00	14.30	18.00	9064000030000

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	-	≤ 150											
	≤ 32	≤ 301											
Free-cutting steels	≤ 25	≤ 255											
	≤ 32	≤ 301											
Unalloyed heat-treatable steels	≤ 20	≤ 220											
	≤ 25	≤ 255											
	≤ 32	≤ 301											
Alloyed heat-treatable steels	≤ 32	≤ 301											
	≤ 43	≤ 402											
Unalloyed case hardened steels	≤ 25	≤ 255											
Alloyed case hardened steels	≤ 32	≤ 301											
	≤ 43	≤ 402											
Nitriding steels	≤ 32	≤ 301											
	≤ 43	≤ 402											
Tool steels	≤ 25	≤ 255											
	≤ 43	≤ 402											
High speed steels	≤ 43	≤ 402											
Spring steels	≤ 38	≤ 354											
Cast iron	≤ 23	≤ 242	395		0.0040	0.0060	0.0090	0.0100	0.0125	0.0160			
	≤ 38	≤ 354	330		0.0040	0.0060	0.0090	0.0100	0.0125	0.0160			
Spheroidal graphite iron and malleable cast iron	≤ 23	≤ 242	295		0.0040	0.0060	0.0090	0.0100	0.0125	0.0160			
	≤ 38	≤ 354	260		0.0040	0.0060	0.0090	0.0100	0.0125	0.0160			
Chilled cast iron	≤ 38	≤ 354	130		0.0013	0.0020	0.0025	0.0030	0.0040	0.0050			
New cast materials GGV	≤ 20	≤ 220											
	≤ 32	≤ 301											
New cast materials ADI	≤ 32	≤ 301											
	≤ 43	≤ 402											
Special alloys	≤ 54	≤ 549											
Ti and Ti-alloys	≤ 25	≤ 255											
	≤ 43	≤ 402											
Aluminium and Al-alloys	-	≤ 120	1345		0.0040	0.0060	0.0090	0.0100	0.0125	0.0160			
Al wrought alloys	-	≤ 200	1345		0.0040	0.0060	0.0090	0.0100	0.0125	0.0160			
Al cast alloys ≤ 10 % Si	-	≤ 180	1245		0.0040	0.0060	0.0090	0.0100	0.0125	0.0160			
≤ 24 % Si	-	≤ 180	1080		0.0040	0.0060	0.0090	0.0100	0.0125	0.0160			
Magnesium alloys	-	≤ 120											
Copper, low-alloyed	-	≤ 150											
Brass, short-chipping	-	≤ 180	920		0.0050	0.0080	0.0120	0.0125	0.0160	0.0200			
long-chipping	-	≤ 180											
Bronze, short-chipping	-	≤ 180	360		0.0040	0.0060	0.0090	0.0100	0.0125	0.0160			
	≤ 25	≤ 255	260		0.0030	0.0050	0.0070	0.0080	0.0100	0.0125			
Bronze, long-chipping	≤ 25	≤ 255											
	≤ 32	≤ 301											
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%.

Material group	Hardness		SFM	Feed Rate - IPR						
	HRc	Bhn		0.0197 in. 0.5 mm	0.0315 in. 0.8 mm	0.0394 in. 1.0 mm	0.0591 in. 1.5 mm	0.0787 in. 2.0 mm	0.0984 in. 2.5 mm	0.1181 in. 3.0 mm
Common structural steels	-	≤ 150	330	0.0020	0.0031	0.0039	0.0059	0.0079	0.0098	0.0118
	≤ 32	≤ 301	330	0.0020	0.0031	0.0039	0.0059	0.0079	0.0098	0.0118
Free-cutting steels	≤ 25	≤ 255	330	0.0020	0.0031	0.0039	0.0059	0.0079	0.0098	0.0118
	≤ 32	≤ 301	295	0.0018	0.0028	0.0035	0.0051	0.0071	0.0087	0.0106
Unalloyed heat-treatable steels	≤ 20	≤ 220	295	0.0020	0.0031	0.0039	0.0059	0.0079	0.0098	0.0118
	≤ 25	≤ 255	295	0.0020	0.0031	0.0039	0.0059	0.0079	0.0098	0.0118
	≤ 32	≤ 301	295	0.0018	0.0028	0.0035	0.0051	0.0071	0.0087	0.0106
Alloyed heat-treatable steels	≤ 32	≤ 301	295	0.0018	0.0028	0.0035	0.0051	0.0071	0.0087	0.0106
	≤ 43	≤ 402	230	0.0016	0.0024	0.0031	0.0047	0.0063	0.0079	0.0094
Unalloyed case hardened steels	≤ 25	≤ 255	330	0.0018	0.0028	0.0035	0.0051	0.0071	0.0087	0.0106
Alloyed case hardened steels	≤ 32	≤ 301	280	0.0018	0.0028	0.0035	0.0051	0.0071	0.0087	0.0106
	≤ 43	≤ 402	230	0.0016	0.0024	0.0031	0.0047	0.0063	0.0079	0.0094
Nitriding steels	≤ 32	≤ 301	230	0.0016	0.0024	0.0031	0.0047	0.0063	0.0079	0.0094
	≤ 43	≤ 402	195	0.0016	0.0024	0.0031	0.0047	0.0063	0.0079	0.0094
Tool steels	≤ 25	≤ 255	165	0.0016	0.0024	0.0031	0.0047	0.0063	0.0079	0.0094
	≤ 43	≤ 402	195	0.0016	0.0024	0.0031	0.0047	0.0063	0.0079	0.0094
High speed steels	≤ 43	≤ 402	195	0.0005	0.0006	0.0009	0.0014	0.0020	0.0028	0.0035
Spring steels	≤ 38	≤ 354	195	0.0005	0.0006	0.0009	0.0014	0.0020	0.0028	0.0035
Hardened steels	≤ 48	≤ 460								
	≤ 66	-								
Stainless steels, sulphured	≤ 28	≤ 273	100	0.0005	0.0006	0.0009	0.0014	0.0020	0.0028	0.0035
austenitic	≤ 36	≤ 337	50	0.0002	0.0003	0.0005	0.0008	0.0013	0.0018	0.0024
martensitic	≤ 46	≤ 435	100	0.0005	0.0006	0.0009	0.0014	0.0020	0.0028	0.0035
Cast iron	≤ 23	≤ 242	425	0.0024	0.0035	0.0047	0.0071	0.0094	0.0118	0.0142
	≤ 38	≤ 354	425	0.0024	0.0035	0.0047	0.0071	0.0094	0.0118	0.0142
Spheroidal graphite iron and malleable cast iron	≤ 23	≤ 242	425	0.0024	0.0035	0.0047	0.0071	0.0094	0.0118	0.0142
	≤ 38	≤ 354	395	0.0024	0.0035	0.0043	0.0067	0.0091	0.0110	0.0134
Chilled cast iron	≤ 38	≤ 354								
New cast materials GGV	≤ 20	≤ 220	50	0.0002	0.0003	0.0005	0.0008	0.0013	0.0018	0.0024
	≤ 32	≤ 301								
New cast materials ADI	≤ 32	≤ 301								
	≤ 43	≤ 402								
Special alloys	≤ 54	≤ 549								
Ti and Ti-alloys	≤ 25	≤ 255	35	0.0002	0.0003	0.0005	0.0008	0.0013	0.0018	0.0024
	≤ 43	≤ 402	50	0.0002	0.0003	0.0005	0.0008	0.0013	0.0018	0.0024
Aluminium and Al-alloys	-	≤ 120	230	0.0024	0.0035	0.0047	0.0071	0.0094	0.0118	0.0142
Al wrought alloys	-	≤ 200	230	0.0024	0.0035	0.0047	0.0071	0.0094	0.0118	0.0142
Al cast alloys ≤ 10 % Si	-	≤ 180	445	0.0009	0.0013	0.0017	0.0026	0.0036	0.0047	0.0059
≤ 24 % Si	-	≤ 180	445	0.0009	0.0013	0.0017	0.0026	0.0036	0.0047	0.0059
Magnesium alloys	-	≤ 120								
Copper, low-alloyed	-	≤ 150								
Brass, short-chipping	-	≤ 180								
long-chipping	-	≤ 180								
Bronze, short-chipping	-	≤ 180								
	≤ 25	≤ 255								
Bronze, long-chipping	≤ 25	≤ 255								
	≤ 32	≤ 301								
Duroplastics										
Thermoplastics										
Reinforced plastics - Kevlar										
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