



Tool material

HSS

Surface



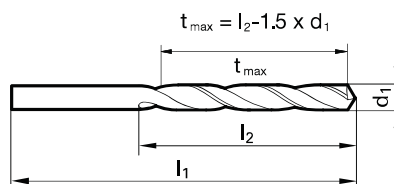
P	Steel	●
M	Stainless steel	
K	Cast iron	●
N	Aluminum	○
S	Titanium alloys	
H	Hardened steel	

●=Optimal

○=Limited

web thinning $\geq \varnothing 1.000$ • relieved cone • for deep holes • for drilling through drill bushes

alloyed/unalloyed steel and cast steel • grey cast iron, malleable and spheroidal iron • sintered powder metal, German silver and graphite



Speeds and feeds information on pg. 520

Shank diameter = cut diameter

Diameter (d ₁)			l ₁ mm	t _{max} mm	l ₂ mm	EDP #
inch	wire/ltr	mm				
0.0197		0.50	32.00	11.25	12.00	9006670005000
0.0236		0.60	35.00	14.10	15.00	9006670006000
0.0256		0.65	38.00	17.03	18.00	9006670006500
0.0276		0.70	42.00	19.95	21.00	9006670007000
0.0295		0.75	42.00	19.88	21.00	9006670007500
0.0315		0.80	46.00	23.80	25.00	9006670008000
0.0335		0.85	46.00	23.73	25.00	9006670008500
0.0354		0.90	51.00	27.65	29.00	9006670009000
0.0374		0.95	51.00	27.58	29.00	9006670009500
0.0394		1.00	56.00	31.50	33.00	9006670010000
0.0413		1.05	56.00	31.43	33.00	9006670010500
0.0433		1.10	60.00	35.35	37.00	9006670011000
0.0453		1.15	60.00	35.28	37.00	9006670011500
0.0472		1.20	65.00	39.20	41.00	9006670012000
0.0492		1.25	65.00	39.13	41.00	9006670012500
0.0512		1.30	65.00	39.05	41.00	9006670013000
0.0531		1.35	70.00	42.98	45.00	9006670013500
0.0551	#54	1.40	70.00	42.90	45.00	9006670014000
0.0571		1.45	70.00	42.83	45.00	9006670014500
0.0591		1.50	70.00	42.75	45.00	9006670015000
0.0610		1.55	76.00	47.68	50.00	9006670015500
0.0626	1/16	1.59	76.00	47.62	50.00	9006670015900
0.0630		1.60	76.00	47.60	50.00	9006670016000
0.0650		1.65	76.00	47.53	50.00	9006670016500
0.0669	#51	1.70	76.00	47.45	50.00	9006670017000
0.0689		1.75	80.00	50.38	53.00	9006670017500
0.0709		1.80	80.00	50.30	53.00	9006670018000
0.0728	#49	1.85	80.00	50.23	53.00	9006670018500
0.0748		1.90	80.00	50.15	53.00	9006670019000
0.0760	#48	1.93	85.00	53.11	56.00	9006670019300
0.0768		1.95	85.00	53.08	56.00	9006670019500
0.0780	5/64	1.98	85.00	53.03	56.00	9006670019800
0.0787		2.00	85.00	53.00	56.00	9006670020000
0.0807		2.05	85.00	52.93	56.00	9006670020500
0.0827		2.10	85.00	52.85	56.00	9006670021000
0.0866		2.20	90.00	55.70	59.00	9006670022000
0.0886		2.25	90.00	55.63	59.00	9006670022500
0.0906		2.30	90.00	55.55	59.00	9006670023000
0.0925		2.35	90.00	55.48	59.00	9006670023500
0.0937	3/32	2.38	95.00	58.43	62.00	9006670023800
0.0945		2.40	95.00	58.40	62.00	9006670024000
0.0961	#41	2.44	95.00	58.34	62.00	9006670024400

Diameter (d ₁)			l ₁ mm	t _{max} mm	l ₂ mm	EDP #
inch	wire/ltr	mm				
0.0965		2.45	95.00	58.33	62.00	9006670024500
0.0984		2.50	95.00	58.25	62.00	9006670025000
0.1004		2.55	95.00	58.18	62.00	9006670025500
0.1024		2.60	95.00	58.10	62.00	9006670026000
0.1043		2.65	95.00	58.03	62.00	9006670026500
0.1063		2.70	100.00	61.95	66.00	9006670027000
0.1083		2.75	100.00	61.88	66.00	9006670027500
0.1094	7/64	2.78	100.00	61.83	66.00	9006670027800
0.1102		2.80	100.00	61.80	66.00	9006670028000
0.1122		2.85	100.00	61.73	66.00	9006670028500
0.1142		2.90	100.00	61.65	66.00	9006670029000
0.1161	#32	2.95	100.00	61.58	66.00	9006670029500
0.1181		3.00	100.00	61.50	66.00	9006670030000
0.1201	#31	3.05	106.00	64.43	69.00	9006670030500
0.1220		3.10	106.00	64.35	69.00	9006670031000
0.1240		3.15	106.00	64.28	69.00	9006670031500
0.1248	1/8	3.17	106.00	64.25	69.00	9006670031700
0.1260		3.20	106.00	64.20	69.00	9006670032000
0.1280		3.25	106.00	64.13	69.00	9006670032500
0.1299		3.30	106.00	64.05	69.00	9006670033000
0.1319		3.35	106.00	63.98	69.00	9006670033500
0.1339		3.40	112.00	67.90	73.00	9006670034000
0.1378		3.50	112.00	67.75	73.00	9006670035000
0.1398		3.55	112.00	67.68	73.00	9006670035500
0.1406	9/64	3.57	112.00	67.65	73.00	9006670035700
0.1417		3.60	112.00	67.60	73.00	9006670036000
0.1437		3.65	112.00	67.53	73.00	9006670036500
0.1457		3.70	112.00	67.45	73.00	9006670037000
0.1496	#25	3.80	119.00	72.30	78.00	9006670038000
0.1516		3.85	119.00	72.23	78.00	9006670038500
0.1535		3.90	119.00	72.15	78.00	9006670039000
0.1555		3.95	119.00	72.08	78.00	9006670039500
0.1563	5/32	3.97	119.00	72.05	78.00	9006670039700
0.1575		4.00	119.00	72.00	78.00	9006670040000
0.1594		4.05	119.00	71.93	78.00	9006670040500
0.1614		4.10	119.00	71.85	78.00	9006670041000
0.1654		4.20	119.00	71.70	78.00	9006670042000
0.1673		4.25	119.00	71.63	78.00	9006670042500
0.1693	#18	4.30	126.00	75.55	82.00	9006670043000
0.1720	11/64	4.37	126.00	75.45	82.00	9006670043700
0.1732		4.40	126.00	75.40	82.00	9006670044000
0.1772	#16	4.50	126.00	75.25	82.00	9006670045000

Diameter (d ₁)			l ₁ mm	t _{max} mm	l ₂ mm	EDP #
inch	wire/ltr	mm				
0.1811		4.60	126.00	75.10	82.00	9006670046000
0.1850	#13	4.70	126.00	74.95	82.00	9006670047000
0.1870		4.75	126.00	74.88	82.00	9006670047500
0.1874	3/16	4.76	132.00	79.86	87.00	9006670047600
0.1890	#12	4.80	132.00	79.80	87.00	9006670048000
0.1909	#11	4.85	132.00	79.73	87.00	9006670048500
0.1929		4.90	132.00	79.65	87.00	9006670049000
0.1937	#10	4.92	132.00	79.62	87.00	9006670049200
0.1961	#9	4.98	132.00	79.53	87.00	9006670049800
0.1969		5.00	132.00	79.50	87.00	9006670050000
0.2008		5.10	132.00	79.35	87.00	9006670051000
0.2031	13/64	5.16	132.00	79.26	87.00	9006670051600
0.2047		5.20	132.00	79.20	87.00	9006670052000
0.2067		5.25	132.00	79.13	87.00	9006670052500
0.2087		5.30	132.00	79.05	87.00	9006670053000
0.2126		5.40	139.00	82.90	91.00	9006670054000
0.2165		5.50	139.00	82.75	91.00	9006670055000
0.2189	7/32	5.56	139.00	82.66	91.00	9006670055600
0.2205		5.60	139.00	82.60	91.00	9006670056000
0.2209	#2	5.61	139.00	82.59	91.00	9006670056100
0.2244		5.70	139.00	82.45	91.00	9006670057000
0.2280	#1	5.79	139.00	82.32	91.00	9006670057900
0.2283		5.80	139.00	82.30	91.00	9006670058000
0.2323		5.90	139.00	82.15	91.00	9006670059000
0.2362		6.00	139.00	82.00	91.00	9006670060000
0.2402		6.10	148.00	87.85	97.00	9006670061000
0.2441		6.20	148.00	87.70	97.00	9006670062000
0.2461	D	6.25	148.00	87.63	97.00	9006670062500
0.2480		6.30	148.00	87.55	97.00	9006670063000
0.2500	1/4 E	6.35	148.00	87.48	97.00	9006670063500
0.2520		6.40	148.00	87.40	97.00	9006670064000
0.2559		6.50	148.00	87.25	97.00	9006670065000
0.2598		6.60	148.00	87.10	97.00	9006670066000
0.2638		6.70	148.00	86.95	97.00	9006670067000
0.2657	17/64 H	6.75	156.00	91.88	102.00	9006670067500
0.2677		6.80	156.00	91.80	102.00	9006670068000
0.2717	I	6.90	156.00	91.65	102.00	9006670069000
0.2756		7.00	156.00	91.50	102.00	9006670070000
0.2795		7.10	156.00	91.35	102.00	9006670071000
0.2811	9/32 K	7.14	156.00	91.29	102.00	9006670071400
0.2835		7.20	156.00	91.20	102.00	9006670072000
0.2874		7.30	156.00	91.05	102.00	9006670073000
0.2902	L	7.37	156.00	90.95	102.00	9006670073700
0.2913		7.40	156.00	90.90	102.00	9006670074000
0.2953		7.50	156.00	90.75	102.00	9006670075000
0.2969	19/64	7.54	165.00	97.69	109.00	9006670075400
0.3031		7.70	165.00	97.45	109.00	9006670077000
0.3071		7.80	165.00	97.30	109.00	9006670078000
0.3110		7.90	165.00	97.15	109.00	9006670079000
0.3126	5/16	7.94	165.00	97.09	109.00	9006670079400
0.3150		8.00	165.00	97.00	109.00	9006670080000
0.3189		8.10	165.00	96.85	109.00	9006670081000
0.3228	P	8.20	165.00	96.70	109.00	9006670082000
0.3268		8.30	165.00	96.55	109.00	9006670083000
0.3307		8.40	165.00	96.40	109.00	9006670084000
0.3346		8.50	165.00	96.25	109.00	9006670085000

Diameter (d ₁)			l ₁ mm	t _{max} mm	l ₂ mm	EDP #
inch	wire/ltr	mm				
0.3386		8.60	175.00	102.10	115.00	9006670086000
0.3425		8.70	175.00	101.95	115.00	9006670087000
0.3437	11/32	8.73	175.00	101.91	115.00	9006670087300
0.3465		8.80	175.00	101.80	115.00	9006670088000
0.3504		8.90	175.00	101.65	115.00	9006670089000
0.3543		9.00	175.00	101.50	115.00	9006670090000
0.3583		9.10	175.00	101.35	115.00	9006670091000
0.3594	23/64	9.13	175.00	101.31	115.00	9006670091300
0.3622		9.20	175.00	101.20	115.00	9006670092000
0.3661		9.30	175.00	101.05	115.00	9006670093000
0.3701		9.40	175.00	100.90	115.00	9006670094000
0.3740		9.50	175.00	100.75	115.00	9006670095000
0.3748	3/8	9.52	184.00	106.72	121.00	9006670095200
0.3780		9.60	184.00	106.60	121.00	9006670096000
0.3819		9.70	184.00	106.45	121.00	9006670097000
0.3858	W	9.80	184.00	106.30	121.00	9006670098000
0.3898		9.90	184.00	106.15	121.00	9006670099000
0.3906	25/64	9.92	184.00	106.12	121.00	9006670099200
0.3937		10.00	184.00	106.00	121.00	9006670100000
0.4016		10.20	184.00	105.70	121.00	9006670102000
0.4063	13/32	10.32	184.00	105.52	121.00	9006670103200
0.4134		10.50	184.00	105.25	121.00	9006670105000
0.4173		10.60	184.00	105.10	121.00	9006670106000
0.4220	27/64	10.72	195.00	111.92	128.00	9006670107200
0.4252		10.80	195.00	111.80	128.00	9006670108000
0.4331		11.00	195.00	111.50	128.00	9006670110000
0.4374	7/16	11.11	195.00	111.34	128.00	9006670111100
0.4528		11.50	195.00	110.75	128.00	9006670115000
0.4531	29/64	11.51	195.00	110.74	128.00	9006670115100
0.4689	15/32	11.91	205.00	116.14	134.00	9006670119100
0.4724		12.00	205.00	116.00	134.00	9006670120000
0.4921		12.50	205.00	115.25	134.00	9006670125000
0.5000	1/2	12.70	205.00	114.95	134.00	9006670127000
0.5118		13.00	205.00	114.50	134.00	9006670130000
0.5311	17/32	13.49	214.00	119.77	140.00	9006670134900
0.5315		13.50	214.00	119.75	140.00	9006670135000
0.5433		13.80	214.00	119.30	140.00	9006670138000
0.5469	35/64	13.89	214.00	119.17	140.00	9006670138900
0.5512		14.00	214.00	119.00	140.00	9006670140000
0.5626	9/16	14.29	220.00	122.57	144.00	9006670142900
0.5709		14.50	220.00	122.25	144.00	9006670145000
0.5780	37/64	14.68	220.00	121.98	144.00	9006670146800
0.5807		14.75	220.00	121.88	144.00	9006670147500
0.5906		15.00	220.00	121.50	144.00	9006670150000
0.5937	19/32	15.08	227.00	126.38	149.00	9006670150800
0.6094	39/64	15.48	227.00	125.78	149.00	9006670154800
0.6102		15.50	227.00	125.75	149.00	9006670155000
0.6248	5/8	15.87	227.00	125.20	149.00	9006670158700
0.6299		16.00	227.00	125.00	149.00	9006670160000
0.6496		16.50	235.00	129.25	154.00	9006670165000
0.6563	21/32	16.67	235.00	129.00	154.00	9006670166700
0.6594		16.75	235.00	128.88	154.00	9006670167500
0.6693		17.00	235.00	128.50	154.00	9006670170000
0.6874	11/16	17.46	241.00	131.81	158.00	9006670174600
0.7087		18.00	241.00	131.00	158.00	9006670180000
0.7185		18.25	247.00	134.63	162.00	9006670182500

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	115 90	0.0017 0.0015	0.0050 0.0040	0.0080 0.0065	0.0100 0.0080						
Free-cutting steels	≤ 25 ≤ 32	≤ 255 ≤ 301	115 90	0.0017 0.0015	0.0050 0.0040	0.0080 0.0065	0.0100 0.0080						
Unalloyed heat-treatable steels	≤ 20 ≤ 25 ≤ 32	≤ 220 ≤ 255 ≤ 301	115 90 70	0.0015 0.0015 0.0012	0.0040 0.0040 0.0030	0.0065 0.0065 0.0050	0.0080 0.0080 0.0065						
Alloyed heat-treatable steels	≤ 32 ≤ 43	≤ 301 ≤ 402	55	0.0012	0.0030	0.0050	0.0065						
Unalloyed case hardened steels	≤ 25	≤ 255	115	0.0017	0.0050	0.0080	0.0100						
Alloyed case hardened steels	≤ 32 ≤ 43	≤ 301 ≤ 402	45	0.0012	0.0030	0.0050	0.0065						
Nitriding steels	≤ 32 ≤ 43	≤ 301 ≤ 402	35	0.0012	0.0030	0.0050	0.0065						
Tool steels	≤ 25 ≤ 43	≤ 255 ≤ 402	55 25	0.0012 0.0010	0.0030 0.0025	0.0050 0.0040	0.0065 0.0050						
High speed steels	≤ 43	≤ 402											
Spring steels	≤ 38	≤ 354											
Hardened steels	≤ 48 ≤ 66	≤ 460 -											
Stainless steels, sulphured austenitic martensitic	≤ 28 ≤ 36 ≤ 46	≤ 273 ≤ 337 ≤ 435											
Cast iron	≤ 23 ≤ 38	≤ 242 ≤ 354	115 90	0.0017 0.0017	0.0050 0.0050	0.0080 0.0080	0.0100 0.0100						
Spheroidal graphite iron and malleable cast iron	≤ 23 ≤ 38	≤ 242 ≤ 354	90 70	0.0017 0.0017	0.0050 0.0050	0.0080 0.0080	0.0100 0.0100						
Chilled cast iron	≤ 38	≤ 354											
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	225 180	0.0020 0.0017	0.0065 0.0050	0.0100 0.0080	0.0125 0.0100						
Magnesium alloys	-	≤ 120	310	0.0017	0.0050	0.0080	0.0100						
Copper, low-alloyed	-	≤ 150	115	0.0015	0.0040	0.0065	0.0080						
Brass, short-chipping long-chipping	- -	≤ 180 ≤ 180	145	0.0015	0.0040	0.0065	0.0080						
Bronze, short-chipping	-	≤ 180	115	0.0012	0.0030	0.0050	0.0065						
Bronze, long-chipping	≤ 25 ≤ 32	≤ 255 ≤ 301	90 70	0.0012 0.0012	0.0030 0.0030	0.0050 0.0050	0.0065 0.0065						
Duroplastics Thermoplastics Reinforced plastics - Kevlar Reinforced plastics - GFK / CFK			55 90	0.0012 0.0015	0.0030 0.0040	0.0050 0.0065	0.0065 0.0080						

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	115 90	0.0017 0.0015	0.0050 0.0040	0.0080 0.0065	0.0100 0.0080	0.0125 0.0100					
Free-cutting steels	≤ 25 ≤ 32	≤ 255 ≤ 301	115 90	0.0017 0.0015	0.0050 0.0040	0.0080 0.0065	0.0100 0.0080	0.0125 0.0100					
Unalloyed heat-treatable steels	≤ 20 ≤ 25 ≤ 32	≤ 220 ≤ 255 ≤ 301	115 90 70	0.0015 0.0015 0.0012	0.0040 0.0040 0.0030	0.0065 0.0065 0.0050	0.0080 0.0080 0.0065	0.0100 0.0100 0.0080					
Alloyed heat-treatable steels	≤ 32 ≤ 43	≤ 301 ≤ 402	55	0.0012	0.0030	0.0050	0.0065	0.0080					
Unalloyed case hardened steels	≤ 25	≤ 255	115	0.0017	0.0050	0.0080	0.0100	0.0125					
Alloyed case hardened steels	≤ 32 ≤ 43	≤ 301 ≤ 402	45	0.0012	0.0030	0.0050	0.0065	0.0080					
Nitriding steels	≤ 32 ≤ 43	≤ 301 ≤ 402	35	0.0012	0.0030	0.0050	0.0065	0.0080					
Tool steels	≤ 25 ≤ 43	≤ 255 ≤ 402	55 25	0.0012 0.0010	0.0030 0.0025	0.0050 0.0040	0.0065 0.0050	0.0080 0.0065					
High speed steels	≤ 43	≤ 402											
Spring steels	≤ 38	≤ 354											
Hardened steels	≤ 48 ≤ 66	≤ 460 -											
Stainless steels, sulphured austenitic martensitic	≤ 28 ≤ 36 ≤ 46	≤ 273 ≤ 337 ≤ 435											
Cast iron	≤ 23 ≤ 38	≤ 242 ≤ 354	115 90	0.0017 0.0017	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	90 70	0.0017 0.0017	0.0050 0.0050	0.0080 0.0080	0.0100 0.0100	0.0125 0.0125					
Chilled cast iron	≤ 38	≤ 354											
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	225 180	0.0020 0.0017	0.0065 0.0050	0.0100 0.0080	0.0125 0.0100	0.0160 0.0125					
Magnesium alloys	-	≤ 120											
Copper, low-alloyed	-	≤ 150	115	0.0015	0.0040	0.0065	0.0080	0.0100					
Brass, short-chipping long-chipping	- -	≤ 180 ≤ 180	145	0.0015	0.0040	0.0065	0.0080	0.0100					
Bronze, short-chipping	-	≤ 180											
Bronze, long-chipping	≤ 25 ≤ 32	≤ 255 ≤ 301	90 70	0.0012 0.0012	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			55	0.0012	0.0030	0.0050	0.0065	0.0080					