

Tool material **HSS**

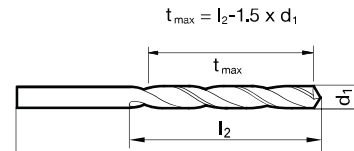
Surface

<b>P</b>	Steel
<b>M</b>	Stainless steel
<b>K</b>	Cast iron
<b>N</b>	Aluminum ●
<b>S</b>	Titanium alloys
<b>H</b>	Hardened steel

web thinning ≥ Ø 14.500 • relieved cone • for deep holes

soft, long chipping materials • aluminum, Al-alloys (long-chipping) • zinc, refined copper, silumin, Elektron • soft synthetic materials, wood

●=Optimal  
○=Limited



Speeds and feeds information on pg. 478

Shank diameter = cut diameter

Diameter (d <sub>1</sub> )			l <sub>1</sub> mm	t <sub>max</sub> mm	l <sub>2</sub> mm	EDP #
inch	wire/ltr	mm				
0.0157	1/64	0.40	30.00	9.40	10.00	9002190004000
0.0197		0.50	32.00	11.25	12.00	9002190005000
0.0236		0.60	35.00	14.10	15.00	9002190006000
0.0256		0.65	38.00	17.03	18.00	9002190006500
0.0276		0.70	42.00	19.95	21.00	9002190007000
0.0291	#69	0.74	42.00	19.89	21.00	9002190007400
0.0295		0.75	42.00	19.88	21.00	9002190007500
0.0315		0.80	46.00	23.80	25.00	9002190008000
0.0335		0.85	46.00	23.73	25.00	9002190008500
0.0354		0.90	51.00	27.65	29.00	9002190009000
0.0374		0.95	51.00	27.58	29.00	9002190009500
0.0394		1.00	56.00	31.50	33.00	9002190010000
0.0413		1.05	56.00	31.43	33.00	9002190010500
0.0433		1.10	60.00	35.35	37.00	9002190011000
0.0453		1.15	60.00	35.28	37.00	9002190011500
0.0472		1.20	65.00	39.20	41.00	9002190012000
0.0480		1.22	65.00	39.17	41.00	9002190012200
0.0492		1.25	65.00	39.13	41.00	9002190012500
0.0512		1.30	65.00	39.05	41.00	9002190013000
0.0531		1.35	70.00	42.98	45.00	9002190013500
0.0551	#54	1.40	70.00	42.90	45.00	9002190014000
0.0571		1.45	70.00	42.83	45.00	9002190014500
0.0591		1.50	70.00	42.75	45.00	9002190015000
0.0610		1.55	76.00	47.68	50.00	9002190015500
0.0630		1.60	76.00	47.60	50.00	9002190016000
0.0650		1.65	76.00	47.53	50.00	9002190016500
0.0669	#51	1.70	76.00	47.45	50.00	9002190017000
0.0689		1.75	80.00	50.38	53.00	9002190017500
0.0701	#50	1.78	80.00	50.33	53.00	9002190017800
0.0709		1.80	80.00	50.30	53.00	9002190018000
0.0728	#49	1.85	80.00	50.23	53.00	9002190018500
0.0748		1.90	80.00	50.15	53.00	9002190019000
0.0768		1.95	85.00	53.08	56.00	9002190019500
0.0780	5/64	1.98	85.00	53.03	56.00	9002190019800
0.0787		2.00	85.00	53.00	56.00	9002190020000
0.0807		2.05	85.00	52.93	56.00	9002190020500
0.0827		2.10	85.00	52.85	56.00	9002190021000
0.0846		2.15	90.00	55.78	59.00	9002190021500
0.0866		2.20	90.00	55.70	59.00	9002190022000
0.0886		2.25	90.00	55.63	59.00	9002190022500
0.0906		2.30	90.00	55.55	59.00	9002190023000
0.0925		2.35	90.00	55.48	59.00	9002190023500
0.0937	3/32	2.38	95.00	58.43	62.00	9002190023800

Diameter (d <sub>1</sub> )			l <sub>1</sub> mm	t <sub>max</sub> mm	l <sub>2</sub> mm	EDP #
inch	wire/ltr	mm				
0.0945		2.40	95.00	58.40	62.00	9002190024000
0.0965		2.45	95.00	58.33	62.00	9002190024500
0.0984		2.50	95.00	58.25	62.00	9002190025000
0.1004		2.55	95.00	58.18	62.00	9002190025500
0.1024		2.60	95.00	58.10	62.00	9002190026000
0.1043		2.65	95.00	58.03	62.00	9002190026500
0.1063		2.70	100.00	61.95	66.00	9002190027000
0.1083		2.75	100.00	61.88	66.00	9002190027500
0.1102		2.80	100.00	61.80	66.00	9002190028000
0.1122		2.85	100.00	61.73	66.00	9002190028500
0.1142		2.90	100.00	61.65	66.00	9002190029000
0.1161	#32	2.95	100.00	61.58	66.00	9002190029500
0.1181		3.00	100.00	61.50	66.00	9002190030000
0.1220		3.10	106.00	64.35	69.00	9002190031000
0.1240		3.15	106.00	64.28	69.00	9002190031500
0.1248	1/8	3.17	106.00	64.25	69.00	9002190031700
0.1260		3.20	106.00	64.20	69.00	9002190032000
0.1280		3.25	106.00	64.13	69.00	9002190032500
0.1299		3.30	106.00	64.05	69.00	9002190033000
0.1319		3.35	106.00	63.98	69.00	9002190033500
0.1339		3.40	112.00	67.90	73.00	9002190034000
0.1358	#29	3.45	112.00	67.83	73.00	9002190034500
0.1378		3.50	112.00	67.75	73.00	9002190035000
0.1398		3.55	112.00	67.68	73.00	9002190035500
0.1417		3.60	112.00	67.60	73.00	9002190036000
0.1437		3.65	112.00	67.53	73.00	9002190036500
0.1457		3.70	112.00	67.45	73.00	9002190037000
0.1476		3.75	112.00	67.38	73.00	9002190037500
0.1496	#25	3.80	119.00	72.30	78.00	9002190038000
0.1535		3.90	119.00	72.15	78.00	9002190039000
0.1575		4.00	119.00	72.00	78.00	9002190040000
0.1614		4.10	119.00	71.85	78.00	9002190041000
0.1634		4.15	119.00	71.78	78.00	9002190041500
0.1654		4.20	119.00	71.70	78.00	9002190042000
0.1673		4.25	119.00	71.63	78.00	9002190042500
0.1693	#18	4.30	126.00	75.55	82.00	9002190043000
0.1732		4.40	126.00	75.40	82.00	9002190044000
0.1772	#16	4.50	126.00	75.25	82.00	9002190045000
0.1811		4.60	126.00	75.10	82.00	9002190046000
0.1850	#13	4.70	126.00	74.95	82.00	9002190047000
0.1890	#12	4.80	132.00	79.80	87.00	9002190048000
0.1929		4.90	132.00	79.65	87.00	9002190049000
0.1969		5.00	132.00	79.50	87.00	9002190050000

Taper Length

Diameter (d <sub>1</sub> )			l <sub>1</sub> mm	t <sub>max</sub> mm	l <sub>2</sub> mm	EDP #
inch	wire/ltr	mm				
0.2008		5.10	132.00	79.35	87.00	9002190051000
0.2047		5.20	132.00	79.20	87.00	9002190052000
0.2087		5.30	132.00	79.05	87.00	9002190053000
0.2126		5.40	139.00	82.90	91.00	9002190054000
0.2165		5.50	139.00	82.75	91.00	9002190055000
0.2205		5.60	139.00	82.60	91.00	9002190056000
0.2244		5.70	139.00	82.45	91.00	9002190057000
0.2283		5.80	139.00	82.30	91.00	9002190058000
0.2323		5.90	139.00	82.15	91.00	9002190059000
0.2362		6.00	139.00	82.00	91.00	9002190060000
0.2402		6.10	148.00	87.85	97.00	9002190061000
0.2441		6.20	148.00	87.70	97.00	9002190062000
0.2461	D	6.25	148.00	87.63	97.00	9002190062500
0.2480		6.30	148.00	87.55	97.00	9002190063000
0.2520		6.40	148.00	87.40	97.00	9002190064000
0.2559		6.50	148.00	87.25	97.00	9002190065000
0.2598		6.60	148.00	87.10	97.00	9002190066000
0.2638		6.70	148.00	86.95	97.00	9002190067000
0.2677		6.80	156.00	91.80	102.00	9002190068000
0.2717	I	6.90	156.00	91.65	102.00	9002190069000
0.2756		7.00	156.00	91.50	102.00	9002190070000
0.2795		7.10	156.00	91.35	102.00	9002190071000
0.2835		7.20	156.00	91.20	102.00	9002190072000
0.2874		7.30	156.00	91.05	102.00	9002190073000
0.2913		7.40	156.00	90.90	102.00	9002190074000
0.2953		7.50	156.00	90.75	102.00	9002190075000
0.3031		7.70	165.00	97.45	109.00	9002190077000
0.3071		7.80	165.00	97.30	109.00	9002190078000
0.3110		7.90	165.00	97.15	109.00	9002190079000
0.3150		8.00	165.00	97.00	109.00	9002190080000
0.3169		8.05	165.00	96.93	109.00	9002190080500
0.3189		8.10	165.00	96.85	109.00	9002190081000
0.3228	P	8.20	165.00	96.70	109.00	9002190082000

Diameter (d <sub>1</sub> )			l <sub>1</sub> mm	t <sub>max</sub> mm	l <sub>2</sub> mm	EDP #
inch	wire/ltr	mm				
0.3268		8.30	165.00	96.55	109.00	9002190083000
0.3307		8.40	165.00	96.40	109.00	9002190084000
0.3346		8.50	165.00	96.25	109.00	9002190085000
0.3366		8.55	175.00	102.18	115.00	9002190085500
0.3386		8.60	175.00	102.10	115.00	9002190086000
0.3425		8.70	175.00	101.95	115.00	9002190087000
0.3465		8.80	175.00	101.80	115.00	9002190088000
0.3504		8.90	175.00	101.65	115.00	9002190089000
0.3543		9.00	175.00	101.50	115.00	9002190090000
0.3583		9.10	175.00	101.35	115.00	9002190091000
0.3622		9.20	175.00	101.20	115.00	9002190092000
0.3740		9.50	175.00	100.75	115.00	9002190095000
0.3819		9.70	184.00	106.45	121.00	9002190097000
0.3858	W	9.80	184.00	106.30	121.00	9002190098000
0.3937		10.00	184.00	106.00	121.00	9002190100000
0.4016		10.20	184.00	105.70	121.00	9002190102000
0.4134		10.50	184.00	105.25	121.00	9002190105000
0.4252		10.80	195.00	111.80	128.00	9002190108000
0.4331		11.00	195.00	111.50	128.00	9002190110000
0.4528		11.50	195.00	110.75	128.00	9002190115000
0.4724		12.00	205.00	116.00	134.00	9002190120000
0.4921		12.50	205.00	115.25	134.00	9002190125000
0.5118		13.00	205.00	114.50	134.00	9002190130000
0.5157	33/64	13.10	205.00	114.35	134.00	9002190131000
0.5512		14.00	214.00	119.00	140.00	9002190140000
0.5709		14.50	220.00	122.25	144.00	9002190145000
0.5906		15.00	220.00	121.50	144.00	9002190150000
0.6299		16.00	227.00	125.00	149.00	9002190160000
0.6693		17.00	235.00	128.50	154.00	9002190170000
0.7087		18.00	241.00	131.00	158.00	9002190180000
0.7480		19.00	247.00	133.50	162.00	9002190190000
0.7874		20.00	254.00	136.00	166.00	9002190200000

Taper Length

Series # 217

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	90 70	0.0017 0.0015	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	90 70	0.0017 0.0015	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		
Unalloyed heat-treatable steels	≤ 20 ≤ 25 ≤ 32	≤ 220 ≤ 255 ≤ 301	90 70	0.0015 0.0015	0.0040 0.0040	0.0065 0.0065	0.0080 0.0080	0.0100 0.0100	0.0100 0.0100	0.0110 0.0110	0.0125 0.0125		
Alloyed heat-treatable steels	≤ 32 ≤ 43	≤ 301 ≤ 402											
Unalloyed case hardened steels	≤ 25	≤ 255	90	0.0017	0.0050	0.0080	0.0100	0.0125	0.0125	0.0140	0.0160		
Alloyed case hardened steels	≤ 32 ≤ 43	≤ 301 ≤ 402											
Nitriding steels	≤ 32 ≤ 43	≤ 301 ≤ 402											
Tool steels	≤ 25 ≤ 43	≤ 255 ≤ 402	45	0.0012	0.0030	0.0050	0.0065	0.0080	0.0080	0.0090	0.0100		
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	90 70	0.0017 0.0017	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		
Spheroidal graphite iron and malleable cast iron	≤ 23 ≤ 38	≤ 242 ≤ 354	70 55	0.0017 0.0017	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		
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	180 145	0.0020 0.0017	0.0065 0.0050	0.0100 0.0080	0.0125 0.0100	0.0160 0.0125	0.0160 0.0125	0.0180 0.0140	0.0200 0.0160		
Magnesium alloys	-	≤ 120	225	0.0017	0.0050	0.0080	0.0100	0.0125	0.0125	0.0140	0.0160		
Copper, low-alloyed	-	≤ 150	90	0.0015	0.0040	0.0065	0.0080	0.0100	0.0100	0.0110	0.0125		
Brass, short-chipping long-chipping	- -	≤ 180 ≤ 180	110	0.0015	0.0040	0.0065	0.0080	0.0100	0.0100	0.0110	0.0125		
Bronze, short-chipping	-	≤ 180	90	0.0012	0.0030	0.0050	0.0065	0.0080	0.0080	0.0090	0.0100		
Bronze, long-chipping	≤ 25 ≤ 32	≤ 255 ≤ 301	70	0.0012	0.0030	0.0050	0.0065	0.0080	0.0080	0.0090	0.0100		
Duroplastics Thermoplastics Reinforced plastics - Kevlar Reinforced plastics - GFK / CFK			45 70	0.0012 0.0015	0.0030 0.0040	0.0050 0.0065	0.0065 0.0080	0.0080 0.0100	0.0080 0.0100	0.0090 0.0110	0.0100 0.0125		

Series # 219

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											
Hardened steels	≤ 48 ≤ 66	≤ 460 -											
Stainless steels, sulphured austenitic martensitic	≤ 28 ≤ 36 ≤ 46	≤ 273 ≤ 337 ≤ 435											
Cast iron	≤ 23 ≤ 38	≤ 242 ≤ 354											
Spheroidal graphite iron and malleable cast iron	≤ 23 ≤ 38	≤ 242 ≤ 354											
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	225	0.0020	0.0065	0.0100	0.0125	0.0160	0.0160	0.0180			
Al wrought alloys	-	≤ 200	225	0.0020	0.0065	0.0100	0.0125	0.0160	0.0160	0.0180			
Al cast alloys ≤ 10 % Si ≤ 24 % Si	- -	≤ 180 ≤ 180	180	0.0020	0.0065	0.0100	0.0125	0.0160	0.0160	0.0180			
Magnesium alloys	-	≤ 120											
Copper, low-alloyed	-	≤ 150	90	0.0015	0.0040	0.0065	0.0080	0.0100	0.0100	0.0110			
Brass, short-chipping long-chipping	- -	≤ 180 ≤ 180											
Bronze, short-chipping	-	≤ 180											
Bronze, long-chipping	≤ 25 ≤ 32	≤ 255 ≤ 301											
Duroplastics Thermoplastics Reinforced plastics - Kevlar Reinforced plastics - GFK / CFK			70	0.0015	0.0040	0.0065	0.0080	0.0100	0.0100	0.0110			