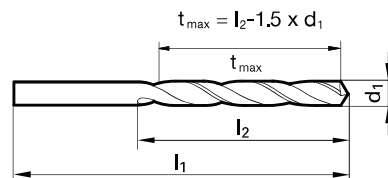


Tool material **HSCo**

Surface

P Steel	•	web thinning $\geq \varnothing 1.000$ • relieved cone • Co-alloyed high speed steel • increased wear resistance
M Stainless steel	○	
K Cast iron	•	alloyed/unalloyed steels and castings over 800 N/mm ² • hot and cold
N Aluminum	•	rolled steels • antifriction bearing steels • high-alloyed steels • heat
S Titanium alloys	○	treatable and case hardened steels
H Hardened steel		

●=Optimal
○=Limited



Speeds and feeds information on pg. 490

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	9003170005000
0.0256		0.65	38.00	17.03	18.00	9003170006500
0.0276		0.70	42.00	19.95	21.00	9003170007000
0.0295		0.75	42.00	19.88	21.00	9003170007500
0.0315		0.80	46.00	23.80	25.00	9003170008000
0.0335		0.85	46.00	23.73	25.00	9003170008500
0.0354		0.90	51.00	27.65	29.00	9003170009000
0.0374		0.95	51.00	27.58	29.00	9003170009500
0.0394		1.00	56.00	31.50	33.00	9003170010000
0.0402	#60	1.02	56.00	31.47	33.00	9003170010200
0.0433		1.10	60.00	35.35	37.00	9003170011000
0.0469	3/64	1.19	65.00	39.22	41.00	9003170011900
0.0472		1.20	65.00	39.20	41.00	9003170012000
0.0492		1.25	65.00	39.13	41.00	9003170012500
0.0512		1.30	65.00	39.05	41.00	9003170013000
0.0551	#54	1.40	70.00	42.90	45.00	9003170014000
0.0591		1.50	70.00	42.75	45.00	9003170015000
0.0594	#53	1.51	76.00	47.74	50.00	9003170015100
0.0610		1.55	76.00	47.68	50.00	9003170015500
0.0626	1/16	1.59	76.00	47.62	50.00	9003170015900
0.0630		1.60	76.00	47.60	50.00	9003170016000
0.0650		1.65	76.00	47.53	50.00	9003170016500
0.0669	#51	1.70	76.00	47.45	50.00	9003170017000
0.0701	#50	1.78	80.00	50.33	53.00	9003170017800
0.0709		1.80	80.00	50.30	53.00	9003170018000
0.0748		1.90	80.00	50.15	53.00	9003170019000
0.0768		1.95	85.00	53.08	56.00	9003170019500
0.0780	5/64	1.98	85.00	53.03	56.00	9003170019800
0.0787		2.00	85.00	53.00	56.00	9003170020000
0.0807		2.05	85.00	52.93	56.00	9003170020500
0.0827		2.10	85.00	52.85	56.00	9003170021000
0.0866		2.20	90.00	55.70	59.00	9003170022000
0.0906		2.30	90.00	55.55	59.00	9003170023000
0.0937	3/32	2.38	95.00	58.43	62.00	9003170023800
0.0945		2.40	95.00	58.40	62.00	9003170024000
0.0965		2.45	95.00	58.33	62.00	9003170024500
0.0984		2.50	95.00	58.25	62.00	9003170025000
0.1024		2.60	95.00	58.10	62.00	9003170026000
0.1063		2.70	100.00	61.95	66.00	9003170027000
0.1094	7/64	2.78	100.00	61.83	66.00	9003170027800
0.1102		2.80	100.00	61.80	66.00	9003170028000
0.1142		2.90	100.00	61.65	66.00	9003170029000
0.1181		3.00	100.00	61.50	66.00	9003170030000

Diameter (d ₁)			l ₁ mm	t _{max} mm	l ₂ mm	EDP #
inch	wire/ltr	mm				
0.1201	#31	3.05	106.00	64.43	69.00	9003170030500
0.1220		3.10	106.00	64.35	69.00	9003170031000
0.1248	1/8	3.17	106.00	64.25	69.00	9003170031700
0.1260		3.20	106.00	64.20	69.00	9003170032000
0.1280		3.25	106.00	64.13	69.00	9003170032500
0.1299		3.30	106.00	64.05	69.00	9003170033000
0.1339		3.40	112.00	67.90	73.00	9003170034000
0.1358	#29	3.45	112.00	67.83	73.00	9003170034500
0.1378		3.50	112.00	67.75	73.00	9003170035000
0.1417		3.60	112.00	67.60	73.00	9003170036000
0.1457		3.70	112.00	67.45	73.00	9003170037000
0.1496	#25	3.80	119.00	72.30	78.00	9003170038000
0.1535		3.90	119.00	72.15	78.00	9003170039000
0.1563	5/32	3.97	119.00	72.05	78.00	9003170039700
0.1575		4.00	119.00	72.00	78.00	9003170040000
0.1614		4.10	119.00	71.85	78.00	9003170041000
0.1654		4.20	119.00	71.70	78.00	9003170042000
0.1693	#18	4.30	126.00	75.55	82.00	9003170043000
0.1720	11/64	4.37	126.00	75.45	82.00	9003170043700
0.1732		4.40	126.00	75.40	82.00	9003170044000
0.1772	#16	4.50	126.00	75.25	82.00	9003170045000
0.1811		4.60	126.00	75.10	82.00	9003170046000
0.1850	#13	4.70	126.00	74.95	82.00	9003170047000
0.1874	3/16	4.76	132.00	79.86	87.00	9003170047600
0.1890	#12	4.80	132.00	79.80	87.00	9003170048000
0.1909	#11	4.85	132.00	79.73	87.00	9003170048500
0.1929		4.90	132.00	79.65	87.00	9003170049000
0.1969		5.00	132.00	79.50	87.00	9003170050000
0.2008		5.10	132.00	79.35	87.00	9003170051000
0.2031	13/64	5.16	132.00	79.26	87.00	9003170051600
0.2047		5.20	132.00	79.20	87.00	9003170052000
0.2087		5.30	132.00	79.05	87.00	9003170053000
0.2126		5.40	139.00	82.90	91.00	9003170054000
0.2165		5.50	139.00	82.75	91.00	9003170055000
0.2189	7/32	5.56	139.00	82.66	91.00	9003170055600
0.2205		5.60	139.00	82.60	91.00	9003170056000
0.2244		5.70	139.00	82.45	91.00	9003170057000
0.2283		5.80	139.00	82.30	91.00	9003170058000
0.2323		5.90	139.00	82.15	91.00	9003170059000
0.2343	15/64	5.95	139.00	82.08	91.00	9003170059500
0.2362		6.00	139.00	82.00	91.00	9003170060000
0.2402		6.10	148.00	87.85	97.00	9003170061000
0.2441		6.20	148.00	87.70	97.00	9003170062000

Taper Length

Diameter (d ₁)			l ₁ mm	t _{max} mm	l ₂ mm	EDP #
inch	wire/ltr	mm				
0.2480		6.30	148.00	87.55	97.00	9003170063000
0.2500	1/4 E	6.35	148.00	87.48	97.00	9003170063500
0.2520		6.40	148.00	87.40	97.00	9003170064000
0.2559		6.50	148.00	87.25	97.00	9003170065000
0.2598		6.60	148.00	87.10	97.00	9003170066000
0.2610	G	6.63	148.00	87.06	97.00	9003170066300
0.2638		6.70	148.00	86.95	97.00	9003170067000
0.2657	17/64 H	6.75	156.00	91.88	102.00	9003170067500
0.2677		6.80	156.00	91.80	102.00	9003170068000
0.2717	I	6.90	156.00	91.65	102.00	9003170069000
0.2756		7.00	156.00	91.50	102.00	9003170070000
0.2811	9/32 K	7.14	156.00	91.29	102.00	9003170071400
0.2835		7.20	156.00	91.20	102.00	9003170072000
0.2874		7.30	156.00	91.05	102.00	9003170073000
0.2913		7.40	156.00	90.90	102.00	9003170074000
0.2953		7.50	156.00	90.75	102.00	9003170075000
0.2969	19/64	7.54	165.00	97.69	109.00	9003170075400
0.2992		7.60	165.00	97.60	109.00	9003170076000
0.3031		7.70	165.00	97.45	109.00	9003170077000
0.3071		7.80	165.00	97.30	109.00	9003170078000
0.3110		7.90	165.00	97.15	109.00	9003170079000
0.3126	5/16	7.94	165.00	97.09	109.00	9003170079400
0.3150		8.00	165.00	97.00	109.00	9003170080000
0.3189		8.10	165.00	96.85	109.00	9003170081000
0.3228	P	8.20	165.00	96.70	109.00	9003170082000
0.3280	21/64	8.33	165.00	96.51	109.00	9003170083300
0.3307		8.40	165.00	96.40	109.00	9003170084000
0.3346		8.50	165.00	96.25	109.00	9003170085000
0.3386		8.60	175.00	102.10	115.00	9003170086000
0.3425		8.70	175.00	101.95	115.00	9003170087000
0.3437	11/32	8.73	175.00	101.91	115.00	9003170087300
0.3465		8.80	175.00	101.80	115.00	9003170088000
0.3543		9.00	175.00	101.50	115.00	9003170090000
0.3583		9.10	175.00	101.35	115.00	9003170091000
0.3594	23/64	9.13	175.00	101.31	115.00	9003170091300
0.3622		9.20	175.00	101.20	115.00	9003170092000

Diameter (d ₁)			l ₁ mm	t _{max} mm	l ₂ mm	EDP #
inch	wire/ltr	mm				
0.3661		9.30	175.00	101.05	115.00	9003170093000
0.3701		9.40	175.00	100.90	115.00	9003170094000
0.3740		9.50	175.00	100.75	115.00	9003170095000
0.3748	3/8	9.52	184.00	106.72	121.00	9003170095200
0.3780		9.60	184.00	106.60	121.00	9003170096000
0.3819		9.70	184.00	106.45	121.00	9003170097000
0.3858	W	9.80	184.00	106.30	121.00	9003170098000
0.3898		9.90	184.00	106.15	121.00	9003170099000
0.3906	25/64	9.92	184.00	106.12	121.00	9003170099200
0.3937		10.00	184.00	106.00	121.00	9003170100000
0.3976		10.10	184.00	105.85	121.00	9003170101000
0.4016		10.20	184.00	105.70	121.00	9003170102000
0.4063	13/32	10.32	184.00	105.52	121.00	9003170103200
0.4134		10.50	184.00	105.25	121.00	9003170105000
0.4220	27/64	10.72	195.00	111.92	128.00	9003170107200
0.4331		11.00	195.00	111.50	128.00	9003170110000
0.4374	7/16	11.11	195.00	111.34	128.00	9003170111100
0.4409		11.20	195.00	111.20	128.00	9003170112000
0.4528		11.50	195.00	110.75	128.00	9003170115000
0.4531	29/64	11.51	195.00	110.74	128.00	9003170115100
0.4646		11.80	195.00	110.30	128.00	9003170118000
0.4689	15/32	11.91	205.00	116.14	134.00	9003170119100
0.4724		12.00	205.00	116.00	134.00	9003170120000
0.4843	31/64	12.30	205.00	115.55	134.00	9003170123000
0.4921		12.50	205.00	115.25	134.00	9003170125000
0.5000	1/2	12.70	205.00	114.95	134.00	9003170127000
0.5118		13.00	205.00	114.50	134.00	9003170130000
0.5157	33/64	13.10	205.00	114.35	134.00	9003170131000
0.5311	17/32	13.49	214.00	119.77	140.00	9003170134900
0.5315		13.50	214.00	119.75	140.00	9003170135000
0.5512		14.00	214.00	119.00	140.00	9003170140000
0.5626	9/16	14.29	220.00	122.57	144.00	9003170142900
0.5906		15.00	220.00	121.50	144.00	9003170150000
0.6094	39/64	15.48	227.00	125.78	149.00	9003170154800
0.6248	5/8	15.87	227.00	125.20	149.00	9003170158700
0.6299		16.00	227.00	125.00	149.00	9003170160000

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	90	0,0015	0,0040	0,0065	0,0080	0,0100	0,0100	0,0110			
Unalloyed heat-treatable steels	≤ 20 ≤ 25 ≤ 32	≤ 220 ≤ 255 ≤ 301	90 45	0,0015 0,0012	0,0040 0,0030	0,0065 0,0050	0,0080 0,0065	0,0100 0,0080	0,0100 0,0080	0,0110 0,0090			
Alloyed heat-treatable steels	≤ 32 ≤ 43	≤ 301 ≤ 402	55 45	0,0012 0,0010	0,0030 0,0025	0,0050 0,0040	0,0065 0,0050	0,0080 0,0065	0,0080 0,0065	0,0090 0,0070			
Unalloyed case hardened steels	≤ 25	≤ 255											
Alloyed case hardened steels	≤ 32 ≤ 43	≤ 301 ≤ 402	50 35	0,0012 0,0010	0,0030 0,0025	0,0050 0,0040	0,0065 0,0050	0,0080 0,0065	0,0080 0,0065	0,0090 0,0070			
Nitriding steels	≤ 32 ≤ 43	≤ 301 ≤ 402	45 30	0,0012 0,0010	0,0030 0,0025	0,0050 0,0040	0,0065 0,0050	0,0080 0,0065	0,0080 0,0065	0,0090 0,0070			
Tool steels	≤ 25 ≤ 43	≤ 255 ≤ 402	55 30	0,0012 0,0010	0,0030 0,0025	0,0050 0,0040	0,0065 0,0050	0,0080 0,0065	0,0080 0,0065	0,0090 0,0070			
High speed steels	≤ 43	≤ 402	30	0,0010	0,0025	0,0040	0,0050	0,0065	0,0065	0,0070			
Spring steels	≤ 38	≤ 354	25	0,0007	0,0020	0,0030	0,0040	0,0050	0,0050	0,0055			
Hardened steels	≤ 48 ≤ 66	≤ 460 -											
Stainless steels, sulphured austenitic martensitic	≤ 28 ≤ 36 ≤ 46	≤ 273 ≤ 337 ≤ 435	45 30 35	0,0012 0,0010 0,0010	0,0030 0,0025 0,0025	0,0050 0,0040 0,0040	0,0065 0,0050 0,0050	0,0080 0,0065 0,0065	0,0080 0,0065 0,0065	0,0090 0,0070 0,0070			
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	0,0125 0,0125	0,0140 0,0140			
Spheroidal graphite iron and malleable cast iron	≤ 23 ≤ 38	≤ 242 ≤ 354	95 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			
Chilled cast iron	≤ 38	≤ 354	25	0,0010	0,0025	0,0040	0,0050	0,0065	0,0065	0,0070			
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	-	≤ 180											
≤ 24 % Si	-	≤ 180											
Magnesium alloys	-	≤ 120											
Copper, low-alloyed	-	≤ 150	115	0,0015	0,0040	0,0065	0,0080	0,0100	0,0100	0,0110			
Brass, short-chipping	-	≤ 180											
long-chipping	-	≤ 180	145	0,0015	0,0040	0,0065	0,0080	0,0100	0,0100	0,0110			
Bronze, short-chipping	-	≤ 180	115	0,0012	0,0030	0,0050	0,0065	0,0080	0,0080	0,0090			
long-chipping	≤ 25 ≤ 32	≤ 255 ≤ 301	95 70	0,0012 0,0012	0,0030 0,0030	0,0050 0,0050	0,0065 0,0065	0,0080 0,0080	0,0080 0,0080	0,0090 0,0090			
Duroplastics			55	0,0012	0,0030	0,0050	0,0065	0,0080	0,0080	0,0090			
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	75	0,0015	0,0040	0,0065	0,0080	0,0100	0,0100	0,0110			
Unalloyed heat-treatable steels	≤ 20 ≤ 25 ≤ 32	≤ 220 ≤ 255 ≤ 301	75 50	0,0015 0,0012	0,0040 0,0030	0,0065 0,0050	0,0080 0,0065	0,0100 0,0080	0,0100 0,0080	0,0110 0,0090			
Alloyed heat-treatable steels	≤ 32 ≤ 43	≤ 301 ≤ 402	50 35	0,0012 0,0010	0,0030 0,0025	0,0050 0,0040	0,0065 0,0050	0,0080 0,0065	0,0080 0,0065	0,0090 0,0070			
Unalloyed case hardened steels	≤ 25	≤ 255											
Alloyed case hardened steels	≤ 32 ≤ 43	≤ 301 ≤ 402	45 30	0,0012 0,0010	0,0030 0,0025	0,0050 0,0040	0,0065 0,0050	0,0080 0,0065	0,0080 0,0065	0,0090 0,0070			
Nitriding steels	≤ 32 ≤ 43	≤ 301 ≤ 402	35 25	0,0012 0,0010	0,0030 0,0025	0,0050 0,0040	0,0065 0,0050	0,0080 0,0065	0,0080 0,0065	0,0090 0,0070			
Tool steels	≤ 25 ≤ 43	≤ 255 ≤ 402	50 25	0,0012 0,0010	0,0030 0,0025	0,0050 0,0040	0,0065 0,0050	0,0080 0,0065	0,0080 0,0065	0,0090 0,0070			
High speed steels	≤ 43	≤ 402	25	0,0010	0,0025	0,0040	0,0050	0,0065	0,0065	0,0070			
Spring steels	≤ 38	≤ 354	15	0,0007	0,0020	0,0030	0,0040	0,0050	0,0050	0,0055			
Hardened steels	≤ 48 ≤ 66	≤ 460 -											
Stainless steels, sulphured austenitic martensitic	≤ 28 ≤ 36 ≤ 46	≤ 273 ≤ 337 ≤ 435	35 25 30	0,0012 0,0010 0,0010	0,0030 0,0025 0,0025	0,0050 0,0040 0,0040	0,0065 0,0050 0,0050	0,0080 0,0065 0,0065	0,0080 0,0065 0,0065	0,0090 0,0070 0,0070			
Cast iron	≤ 23 ≤ 38	≤ 242 ≤ 354	95 75	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			
Spheroidal graphite iron and malleable cast iron	≤ 23 ≤ 38	≤ 242 ≤ 354	75 65	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			
Chilled cast iron	≤ 38	≤ 354	15	0,0010	0,0025	0,0040	0,0050	0,0065	0,0065	0,0070			
New cast materials GGV	≤ 20 ≤ 32	≤ 220 ≤ 301											
New cast materials ADI	≤ 32 ≤ 43	≤ 301 ≤ 402											
Special alloys	≤ 54	≤ 549	15	0,0005	0,0015	0,0025	0,0030	0,0040	0,0040	0,0045			
Ti and Ti-alloys	≤ 25 ≤ 43	≤ 255 ≤ 402											
Aluminium and Al-alloys	-	≤ 120											
Al wrought alloys	-	≤ 200											
Al cast alloys ≤ 10 % Si	-	≤ 180											
≤ 24 % Si	-	≤ 180											
Magnesium alloys	-	≤ 120											
Copper, low-alloyed	-	≤ 150	95	0,0015	0,0040	0,0065	0,0080	0,0100	0,0100	0,0110			
Brass, short-chipping	-	≤ 180											
long-chipping	-	≤ 180	120	0,0015	0,0040	0,0065	0,0080	0,0100	0,0100	0,0110			
Bronze, short-chipping	-	≤ 180	95	0,0012	0,0030	0,0050	0,0065	0,0080	0,0080	0,0090			
long-chipping	≤ 25 ≤ 32	≤ 255 ≤ 301	75 65	0,0012 0,0012	0,0030 0,0030	0,0050 0,0050	0,0065 0,0065	0,0080 0,0080	0,0080 0,0080	0,0090 0,0090			
Duroplastics			50	0,0012	0,0030	0,0050	0,0065	0,0080	0,0080	0,0090			
Thermoplastics													
Reinforced plastics - Kevlar													
Reinforced plastics - GFK / CFK													