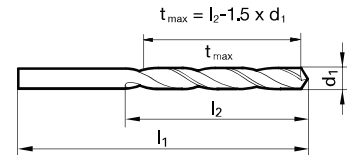


Tool material **HSCO**

Surface

- | | | | |
|----------|-----------------|---|--|
| P | Steel | ● | web thinning ≥ Ø 2.370 • relieved cone • Co-alloyed high speed steel • increased wear resistance |
| M | Stainless steel | ○ | |
| K | Cast iron | ● | alloyed and unalloyed steel • castings over 800 N/mm ² • hot and cold rolled steels • antifriction bearing steels • high-alloyed steels • heat S treatable and case hardened steels |
| N | Aluminum | ○ | |
| S | Titanium alloys | | |
| H | Hardened steel | | |
- =Optimal
○=Limited



Jobber Length

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				
0.0189		0.48	20.00	4.28	5.00	9003080004800
0.0197		0.50	22.00	5.25	6.00	9003080005000
0.0295		0.75	28.00	7.88	9.00	9003080007500
0.0307		0.78	30.00	8.83	10.00	9003080007800
0.0315		0.80	30.00	8.80	10.00	9003080008000
0.0354		0.90	32.00	9.65	11.00	9003080009000
0.0358	#64	0.91	32.00	9.64	11.00	9003080009100
0.0366		0.93	32.00	9.61	11.00	9003080009300
0.0386		0.98	34.00	10.53	12.00	9003080009800
0.0394		1.00	34.00	10.50	12.00	9003080010000
0.0402	#60	1.02	34.00	10.47	12.00	9003080010200
0.0425		1.08	36.00	12.38	14.00	9003080010800
0.0433		1.10	36.00	12.35	14.00	9003080011000
0.0453		1.15	36.00	12.28	14.00	9003080011500
0.0465	#56	1.18	36.00	12.23	14.00	9003080011800
0.0469	3/64	1.19	38.00	14.22	16.00	9003080011900
0.0472		1.20	38.00	14.20	16.00	9003080012000
0.0492		1.25	38.00	14.13	16.00	9003080012500
0.0512		1.30	38.00	14.05	16.00	9003080013000
0.0520	#55	1.32	38.00	14.02	16.00	9003080013200
0.0531		1.35	40.00	15.98	18.00	9003080013500
0.0551	#54	1.40	40.00	15.90	18.00	9003080014000
0.0563		1.43	40.00	15.86	18.00	9003080014300
0.0571		1.45	40.00	15.83	18.00	9003080014500
0.0579		1.47	40.00	15.80	18.00	9003080014700
0.0587		1.49	40.00	15.77	18.00	9003080014900
0.0591		1.50	40.00	15.75	18.00	9003080015000
0.0594	#53	1.51	43.00	17.74	20.00	9003080015100
0.0610		1.55	43.00	17.68	20.00	9003080015500
0.0626	1/16	1.59	43.00	17.62	20.00	9003080015900
0.0630		1.60	43.00	17.60	20.00	9003080016000
0.0661		1.68	43.00	17.48	20.00	9003080016800
0.0669	#51	1.70	43.00	17.45	20.00	9003080017000
0.0677		1.72	46.00	19.42	22.00	9003080017200
0.0689		1.75	46.00	19.38	22.00	9003080017500
0.0701	#50	1.78	46.00	19.33	22.00	9003080017800
0.0709		1.80	46.00	19.30	22.00	9003080018000
0.0728	#49	1.85	46.00	19.23	22.00	9003080018500
0.0748		1.90	46.00	19.15	22.00	9003080019000
0.0760	#48	1.93	49.00	21.11	24.00	9003080019300
0.0768		1.95	49.00	21.08	24.00	9003080019500
0.0780	5/64	1.98	49.00	21.03	24.00	9003080019800
0.0787		2.00	49.00	21.00	24.00	9003080020000
0.0811	#46	2.06	49.00	20.91	24.00	9003080020600

Diameter (d ₁)			l ₁ mm	t _{max} mm	l ₂ mm	EDP #
inch	wire/ltr	mm				
0.0819	#45	2.08	49.00	20.88	24.00	9003080020800
0.0827		2.10	49.00	20.85	24.00	9003080021000
0.0858	#44	2.18	53.00	23.73	27.00	9003080021800
0.0866		2.20	53.00	23.70	27.00	9003080022000
0.0886		2.25	53.00	23.63	27.00	9003080022500
0.0890	#43	2.26	53.00	23.61	27.00	9003080022600
0.0906		2.30	53.00	23.55	27.00	9003080023000
0.0925		2.35	53.00	23.48	27.00	9003080023500
0.0933	#42	2.37	57.00	26.45	30.00	9003080023700
0.0937	3/32	2.38	57.00	26.43	30.00	9003080023800
0.0945		2.40	57.00	26.40	30.00	9003080024000
0.0980	#40	2.49	57.00	26.27	30.00	9003080024900
0.0984		2.50	57.00	26.25	30.00	9003080025000
0.0996	#39	2.53	57.00	26.21	30.00	9003080025300
0.1024		2.60	57.00	26.10	30.00	9003080026000
0.1039	#37	2.64	57.00	26.04	30.00	9003080026400
0.1063		2.70	61.00	28.95	33.00	9003080027000
0.1083		2.75	61.00	28.88	33.00	9003080027500
0.1094	7/64	2.78	61.00	28.83	33.00	9003080027800
0.1098	#35	2.79	61.00	28.82	33.00	9003080027900
0.1102		2.80	61.00	28.80	33.00	9003080028000
0.1110	#34	2.82	61.00	28.77	33.00	9003080028200
0.1142		2.90	61.00	28.65	33.00	9003080029000
0.1161	#32	2.95	61.00	28.58	33.00	9003080029500
0.1181		3.00	61.00	28.50	33.00	9003080030000
0.1201	#31	3.05	65.00	31.43	36.00	9003080030500
0.1220		3.10	65.00	31.35	36.00	9003080031000
0.1248	1/8	3.17	65.00	31.25	36.00	9003080031700
0.1260		3.20	65.00	31.20	36.00	9003080032000
0.1299		3.30	65.00	31.05	36.00	9003080033000
0.1339		3.40	70.00	33.90	39.00	9003080034000
0.1358	#29	3.45	70.00	33.83	39.00	9003080034500
0.1378		3.50	70.00	33.75	39.00	9003080035000
0.1417		3.60	70.00	33.60	39.00	9003080036000
0.1437		3.65	70.00	33.53	39.00	9003080036500
0.1441	#27	3.66	70.00	33.51	39.00	9003080036600
0.1457		3.70	70.00	33.45	39.00	9003080037000
0.1469	#26	3.73	70.00	33.41	39.00	9003080037300
0.1496	#25	3.80	75.00	37.30	43.00	9003080038000
0.1520	#24	3.86	75.00	37.21	43.00	9003080038600
0.1535		3.90	75.00	37.15	43.00	9003080039000
0.1539	#23	3.91	75.00	37.14	43.00	9003080039100
0.1563	5/32	3.97	75.00	37.05	43.00	9003080039700
0.1571	#22	3.99	75.00	37.02	43.00	9003080039900

Jobber Length

Diameter (d ₁)			l ₁ mm	t _{max} mm	l ₂ mm	EDP #
inch	wire/ltr	mm				
0.1575		4.00	75.00	37.00	43.00	9003080040000
0.1591	#21	4.04	75.00	36.94	43.00	9003080040400
0.1594		4.05	75.00	36.93	43.00	9003080040500
0.1610	#20	4.09	75.00	36.87	43.00	9003080040900
0.1614		4.10	75.00	36.85	43.00	9003080041000
0.1634		4.15	75.00	36.78	43.00	9003080041500
0.1654		4.20	75.00	36.70	43.00	9003080042000
0.1661	#19	4.22	75.00	36.67	43.00	9003080042200
0.1693	#18	4.30	80.00	40.55	47.00	9003080043000
0.1720	11/64	4.37	80.00	40.45	47.00	9003080043700
0.1728	#17	4.39	80.00	40.42	47.00	9003080043900
0.1732		4.40	80.00	40.40	47.00	9003080044000
0.1772	#16	4.50	80.00	40.25	47.00	9003080045000
0.1811		4.60	80.00	40.10	47.00	9003080046000
0.1819	#14	4.62	80.00	40.07	47.00	9003080046200
0.1850	#13	4.70	80.00	39.95	47.00	9003080047000
0.1874	3/16	4.76	86.00	44.86	52.00	9003080047600
0.1890	#12	4.80	86.00	44.80	52.00	9003080048000
0.1929		4.90	86.00	44.65	52.00	9003080049000
0.1961	#9	4.98	86.00	44.53	52.00	9003080049800
0.1969		5.00	86.00	44.50	52.00	9003080050000
0.1992	#8	5.06	86.00	44.41	52.00	9003080050600
0.2008		5.10	86.00	44.35	52.00	9003080051000
0.2012	#7	5.11	86.00	44.34	52.00	9003080051100
0.2031	13/64	5.16	86.00	44.26	52.00	9003080051600
0.2039	#6	5.18	86.00	44.23	52.00	9003080051800
0.2047		5.20	86.00	44.20	52.00	9003080052000
0.2055	#5	5.22	86.00	44.17	52.00	9003080052200
0.2087		5.30	86.00	44.05	52.00	9003080053000
0.2091	#4	5.31	93.00	49.04	57.00	9003080053100
0.2126		5.40	93.00	48.90	57.00	9003080054000
0.2130	#3	5.41	93.00	48.89	57.00	9003080054100
0.2165		5.50	93.00	48.75	57.00	9003080055000
0.2189	7/32	5.56	93.00	48.66	57.00	9003080055600
0.2205		5.60	93.00	48.60	57.00	9003080056000
0.2209	#2	5.61	93.00	48.59	57.00	9003080056100
0.2244		5.70	93.00	48.45	57.00	9003080057000
0.2283		5.80	93.00	48.30	57.00	9003080058000
0.2339	A	5.94	93.00	48.09	57.00	9003080059400
0.2343	15/64	5.95	93.00	48.08	57.00	9003080059500
0.2362		6.00	93.00	48.00	57.00	9003080060000
0.2402		6.10	101.00	53.85	63.00	9003080061000
0.2421	C	6.15	101.00	53.78	63.00	9003080061500
0.2441		6.20	101.00	53.70	63.00	9003080062000
0.2461	D	6.25	101.00	53.63	63.00	9003080062500
0.2480		6.30	101.00	53.55	63.00	9003080063000
0.2500	1/4	6.35	101.00	53.48	63.00	9003080063500
0.2559		6.50	101.00	53.25	63.00	9003080065000
0.2598		6.60	101.00	53.10	63.00	9003080066000
0.2638		6.70	101.00	52.95	63.00	9003080067000
0.2657	17/64	6.75	109.00	58.88	69.00	9003080067500
0.2677		6.80	109.00	58.80	69.00	9003080068000

Diameter (d ₁)			l ₁ mm	t _{max} mm	l ₂ mm	EDP #
inch	wire/ltr	mm				
0.2756		7.00	109.00	58.50	69.00	9003080070000
0.2902	L	7.37	109.00	57.95	69.00	9003080073700
0.2913		7.40	109.00	57.90	69.00	9003080074000
0.2953		7.50	109.00	57.75	69.00	9003080075000
0.2969	19/64	7.54	117.00	63.69	75.00	9003080075400
0.2992		7.60	117.00	63.60	75.00	9003080076000
0.3031		7.70	117.00	63.45	75.00	9003080077000
0.3110		7.90	117.00	63.15	75.00	9003080079000
0.3150		8.00	117.00	63.00	75.00	9003080080000
0.3161	O	8.03	117.00	62.96	75.00	9003080080300
0.3189		8.10	117.00	62.85	75.00	9003080081000
0.3228	P	8.20	117.00	62.70	75.00	9003080082000
0.3268		8.30	117.00	62.55	75.00	9003080083000
0.3280	21/64	8.33	117.00	62.51	75.00	9003080083300
0.3346		8.50	117.00	62.25	75.00	9003080085000
0.3386		8.60	125.00	68.10	81.00	9003080086000
0.3390	R	8.61	125.00	68.09	81.00	9003080086100
0.3425		8.70	125.00	67.95	81.00	9003080087000
0.3437	11/32	8.73	125.00	67.91	81.00	9003080087300
0.3465		8.80	125.00	67.80	81.00	9003080088000
0.3480	S	8.84	125.00	67.74	81.00	9003080088400
0.3504		8.90	125.00	67.65	81.00	9003080089000
0.3543		9.00	125.00	67.50	81.00	9003080090000
0.3579	T	9.09	125.00	67.37	81.00	9003080090900
0.3583		9.10	125.00	67.35	81.00	9003080091000
0.3594	23/64	9.13	125.00	67.31	81.00	9003080091300
0.3622		9.20	125.00	67.20	81.00	9003080092000
0.3661		9.30	125.00	67.05	81.00	9003080093000
0.3677	U	9.34	125.00	66.99	81.00	9003080093400
0.3701		9.40	125.00	66.90	81.00	9003080094000
0.3740		9.50	125.00	66.75	81.00	9003080095000
0.3748	3/8	9.52	133.00	72.72	87.00	9003080095200
0.3772	V	9.58	133.00	72.63	87.00	9003080095800
0.3780		9.60	133.00	72.60	87.00	9003080096000
0.3819		9.70	133.00	72.45	87.00	9003080097000
0.3858	W	9.80	133.00	72.30	87.00	9003080098000
0.3898		9.90	133.00	72.15	87.00	9003080099000
0.3906	25/64	9.92	133.00	72.12	87.00	9003080099200
0.3937		10.00	133.00	72.00	87.00	9003080100000
0.4039	Y	10.26	133.00	71.61	87.00	9003080102600
0.4063	13/32	10.32	133.00	71.52	87.00	9003080103200
0.4130	Z	10.49	133.00	71.27	87.00	9003080104900
0.4134		10.50	133.00	71.25	87.00	9003080105000
0.4331		11.00	142.00	77.50	94.00	9003080110000
0.4374	7/16	11.11	142.00	77.34	94.00	9003080111100
0.4528		11.50	142.00	76.75	94.00	9003080115000
0.4531	29/64	11.51	142.00	76.74	94.00	9003080115100
0.4689	15/32	11.91	151.00	83.14	101.00	9003080119100
0.4744		12.05	151.00	82.93	101.00	9003080120500
0.4921		12.50	151.00	82.25	101.00	9003080125000
0.5000	1/2	12.70	151.00	81.95	101.00	9003080127000

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											
Free-cutting steels	25	255											
	32	301	90	0,0015	0,0040	0,0065	0,0080	0,0100	0,0100	0,0110			
Unalloyed heat-treatable steels	20	220											
	25	255	90	0,0015	0,0040	0,0065	0,0080	0,0100	0,0100	0,0110			
	32	301	45	0,0012	0,0030	0,0050	0,0065	0,0080	0,0080	0,0090			
Alloyed heat-treatable steels	32	301	55	0,0012	0,0030	0,0050	0,0065	0,0080	0,0080	0,0090			
	43	402	45	0,0010	0,0025	0,0040	0,0050	0,0065	0,0065	0,0070			
Unalloyed case hardened steels	25	255											
Alloyed case hardened steels	32	301	50	0,0012	0,0030	0,0050	0,0065	0,0080	0,0080	0,0090			
	43	402	35	0,0010	0,0025	0,0040	0,0050	0,0065	0,0065	0,0070			
Nitriding steels	32	301	45	0,0012	0,0030	0,0050	0,0065	0,0080	0,0080	0,0090			
	43	402	30	0,0010	0,0025	0,0040	0,0050	0,0065	0,0065	0,0070			
Tool steels	25	255	55	0,0012	0,0030	0,0050	0,0065	0,0080	0,0080	0,0090			
	43	402	30	0,0010	0,0025	0,0040	0,0050	0,0065	0,0065	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	460											
	66	-											
Stainless steels, sulphured austenitic	28	273	45	0,0012	0,0030	0,0050	0,0065	0,0080	0,0080	0,0090			
	36	337	30	0,0010	0,0025	0,0040	0,0050	0,0065	0,0065	0,0070			
	46	435	35	0,0010	0,0025	0,0040	0,0050	0,0065	0,0065	0,0070			
Cast iron	23	242	115	0,0017	0,0050	0,0080	0,0100	0,0125	0,0125	0,0140			
	38	354	90	0,0017	0,0050	0,0080	0,0100	0,0125	0,0125	0,0140			
Spheroidal graphite iron and malleable cast iron	23	242	95	0,0017	0,0050	0,0080	0,0100	0,0125	0,0125	0,0140			
	38	354	70	0,0017	0,0050	0,0080	0,0100	0,0125	0,0125	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	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											
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											
	-	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			
	25	255	95	0,0012	0,0030	0,0050	0,0065	0,0080	0,0080	0,0090			
Bronze, long-chipping	25	255	90	0,0012	0,0030	0,0050	0,0065	0,0080	0,0080	0,0090			
	32	301	70	0,0012	0,0030	0,0050	0,0065	0,0080	0,0080	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	-	150											
Free-cutting steels	25	255											
	32	301	75	0,0015	0,0040	0,0065	0,0080	0,0100	0,0100	0,0110			
Unalloyed heat-treatable steels	20	220											
	25	255	75	0,0015	0,0040	0,0065	0,0080	0,0100	0,0100	0,0110			
	32	301	50	0,0012	0,0030	0,0050	0,0065	0,0080	0,0080	0,0090			
Alloyed heat-treatable steels	32	301	50	0,0012	0,0030	0,0050	0,0065	0,0080	0,0080	0,0090			
	43	402	35	0,0010	0,0025	0,0040	0,0050	0,0065	0,0065	0,0070			
Unalloyed case hardened steels	25	255											
Alloyed case hardened steels	32	301	45	0,0012	0,0030	0,0050	0,0065	0,0080	0,0080	0,0090			
	43	402	30	0,0010	0,0025	0,0040	0,0050	0,0065	0,0065	0,0070			
Nitriding steels	32	301	35	0,0012	0,0030	0,0050	0,0065	0,0080	0,0080	0,0090			
	43	402	25	0,0010	0,0025	0,0040	0,0050	0,0065	0,0065	0,0070			
Tool steels	25	255	50	0,0012	0,0030	0,0050	0,0065	0,0080	0,0080	0,0090			
	43	402	25	0,0010	0,0025	0,0040	0,0050	0,0065	0,0065	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	460											
	66	-											
Stainless steels, sulphured austenitic	28	273	35	0,0012	0,0030	0,0050	0,0065	0,0080	0,0080	0,0090			
	36	337	25	0,0010	0,0025	0,0040	0,0050	0,0065	0,0065	0,0070			
	46	435	30	0,0010	0,0025	0,0040	0,0050	0,0065	0,0065	0,0070			
Cast iron	23	242	95	0,0017	0,0050	0,0080	0,0100	0,0125	0,0125	0,0140			
	38	354	75	0,0017	0,0050	0,0080	0,0100	0,0125	0,0125	0,0140			
Spheroidal graphite iron and malleable cast iron	23	242	75	0,0017	0,0050	0,0080	0,0100	0,0125	0,0125	0,0140			
	38	354	65	0,0017	0,0050	0,0080	0,0100	0,0125	0,0125	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	220											
	32	301											
New cast materials ADI	32	301											
	43	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	255											
	43	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											
	-	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			
	25	255	75	0,0012	0,0030	0,0050	0,0065	0,0080	0,0080	0,0090			
Bronze, long-chipping	25	255	75	0,0012	0,0030	0,0050	0,0065	0,0080	0,0080	0,0090			
	32	301	65	0,0012	0,0030	0,0050	0,0065	0,0080	0,0080	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													