

5xD

Twist Drills



TiN coated



External Coolant



Straight Shank

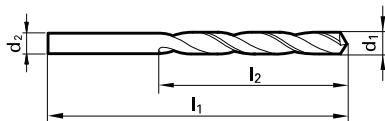
Speeds & Feeds
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Series 651

General Purpose

HSS, general purpose (Type N), jobber length, 118° point, Form A web thinned
>2.36mm dia., standard straight shank, RH helix

Cut / Shank Dia. = h8 tolerance range



$$d_1 = d_2$$

Application Materials:



Universal Steels



Cast Iron



General Steels

Diameter (d1)						
Dec. inch	Fract. inch	Wire / letter	mm	l1 mm	l2 mm	EDP #
0.0079		92	0.200	19.00	2.50	9006510002000
0.0098		87	0.250	19.00	3.00	9006510002500
0.0110		85	0.280	19.00	3.00	9006510002800
0.0118			0.300	19.00	3.00	9006510003000
0.0122		83	0.310	19.00	4.00	9006510003100
0.0130		81	0.330	19.00	4.00	9006510003300
0.0134		80	0.340	19.00	4.00	9006510003400
0.0142			0.360	19.00	4.00	9006510003600
0.0146		79	0.370	19.00	4.00	9006510003700
0.0150			0.380	19.00	4.00	9006510003800
0.0154			0.390	20.00	5.00	9006510003900
0.0157	1/64		0.400	20.00	5.00	9006510004000
0.0161		78	0.410	20.00	5.00	9006510004100
0.0165			0.420	20.00	5.00	9006510004200
0.0169			0.430	20.00	5.00	9006510004300
0.0173			0.440	20.00	5.00	9006510004400
0.0177			0.450	20.00	5.00	9006510004500
0.0181		77	0.460	20.00	5.00	9006510004600
0.0185			0.470	20.00	5.00	9006510004700
0.0189			0.480	20.00	5.00	9006510004800
0.0193			0.490	22.00	6.00	9006510004900
0.0197			0.500	22.00	6.00	9006510005000
0.0201		76	0.510	22.00	6.00	9006510005100
0.0205			0.520	22.00	6.00	9006510005200
0.0209		75	0.530	22.00	6.00	9006510005300
0.0213			0.540	24.00	7.00	9006510005400
0.0217			0.550	24.00	7.00	9006510005500
0.0224		74	0.570	24.00	7.00	9006510005700
0.0228			0.580	24.00	7.00	9006510005800
0.0232			0.590	24.00	7.00	9006510005900
0.0236			0.600	24.00	7.00	9006510006000
0.0240		73	0.610	26.00	8.00	9006510006100
0.0248			0.630	26.00	8.00	9006510006300
0.0252		72	0.640	26.00	8.00	9006510006400
0.0256			0.650	26.00	8.00	9006510006500
0.0260		71	0.660	26.00	8.00	9006510006600
0.0268			0.680	28.00	9.00	9006510006800
0.0272			0.690	28.00	9.00	9006510006900
0.0276			0.700	28.00	9.00	9006510007000
0.0280		70	0.710	28.00	9.00	9006510007100
0.0283			0.720	28.00	9.00	9006510007200
0.0291		69	0.740	28.00	9.00	9006510007400
0.0295			0.750	28.00	9.00	9006510007500
0.0303			0.770	30.00	10.00	9006510007700
0.0307			0.780	30.00	10.00	9006510007800
0.0311	1/32	68	0.790	30.00	10.00	9006510007900
0.0315			0.800	30.00	10.00	9006510008000
0.0319		67	0.810	30.00	10.00	9006510008100
0.0323			0.820	30.00	10.00	9006510008200
0.0327			0.830	30.00	10.00	9006510008300
0.0331		66	0.840	30.00	10.00	9006510008400
0.0335			0.850	30.00	10.00	9006510008500
0.0339			0.860	32.00	11.00	9006510008600
0.0346			0.880	32.00	11.00	9006510008800

Diameter (d1)						
Dec. inch	Fract. inch	Wire / letter	mm	l1 mm	l2 mm	EDP #
0.0350		65	0.890	32.00	11.00	9006510008900
0.0354			0.900	32.00	11.00	9006510009000
0.0358		64	0.910	32.00	11.00	9006510009100
0.0362			0.920	32.00	11.00	9006510009200
0.0366			0.930	32.00	11.00	9006510009300
0.0370		63	0.940	32.00	11.00	9006510009400
0.0374			0.950	32.00	11.00	9006510009500
0.0378			0.960	34.00	12.00	9006510009600
0.0382		62	0.970	34.00	12.00	9006510009700
0.0386			0.980	34.00	12.00	9006510009800
0.0390		61	0.990	34.00	12.00	9006510009900
0.0394			1.000	34.00	12.00	9006510010000
0.0402		60	1.020	34.00	12.00	9006510010200
0.0406			1.030	34.00	12.00	9006510010300
0.0409		59	1.040	34.00	12.00	9006510010400
0.0413			1.050	34.00	12.00	9006510010500
0.0421		58	1.070	36.00	14.00	9006510010700
0.0425			1.080	36.00	14.00	9006510010800
0.0429		57	1.090	36.00	14.00	9006510010900
0.0433			1.100	36.00	14.00	9006510011000
0.0437			1.110	36.00	14.00	9006510011100
0.0441			1.120	36.00	14.00	9006510011200
0.0445			1.130	36.00	14.00	9006510011300
0.0449			1.140	36.00	14.00	9006510011400
0.0453			1.150	36.00	14.00	9006510011500
0.0457			1.160	36.00	14.00	9006510011600
0.0461			1.170	36.00	14.00	9006510011700
0.0465		56	1.180	36.00	14.00	9006510011800
0.0469	3/64		1.190	38.00	16.00	9006510011900
0.0472			1.200	38.00	16.00	9006510012000
0.0476			1.210	38.00	16.00	9006510012100
0.0480			1.220	38.00	16.00	9006510012200
0.0488			1.240	38.00	16.00	9006510012400
0.0492			1.250	38.00	16.00	9006510012500
0.0496			1.260	38.00	16.00	9006510012600
0.0500			1.270	38.00	16.00	9006510012700
0.0504			1.280	38.00	16.00	9006510012800
0.0512			1.300	38.00	16.00	9006510013000
0.0516			1.310	38.00	16.00	9006510013100
0.0520		55	1.320	38.00	16.00	9006510013200
0.0528			1.340	40.00	18.00	9006510013400
0.0531			1.350	40.00	18.00	9006510013500
0.0551		54	1.400	40.00	18.00	9006510014000
0.0559			1.420	40.00	18.00	9006510014200
0.0563			1.430	40.00	18.00	9006510014300
0.0571			1.450	40.00	18.00	9006510014500
0.0575			1.460	40.00	18.00	9006510014600
0.0579			1.470	40.00	18.00	9006510014700
0.0583			1.480	40.00	18.00	9006510014800
0.0591			1.500	40.00	18.00	9006510015000
0.0594		53	1.510	43.00	20.00	9006510015100
0.0598			1.520	43.00	20.00	9006510015200
0.0602			1.530	43.00	20.00	9006510015300
0.0606			1.540	43.00	20.00	9006510015400

Series 651

Speeds & Feeds information pg 446

Twist Drills

Diameter (d1)		I1	I2	EDP #
Dec. inch	Fract. inch			
0.0610		1.550	43.00	20.00
0.0618		1.570	43.00	20.00
0.0626	1/16	1.590	43.00	20.00
0.0630		1.600	43.00	20.00
0.0634	52	1.610	43.00	20.00
0.0638		1.620	43.00	20.00
0.0646		1.640	43.00	20.00
0.0650		1.650	43.00	20.00
0.0661		1.680	43.00	20.00
0.0669	51	1.700	43.00	20.00
0.0673		1.710	46.00	22.00
0.0681		1.730	46.00	22.00
0.0689		1.750	46.00	22.00
0.0697		1.770	46.00	22.00
0.0701	50	1.780	46.00	22.00
0.0709		1.800	46.00	22.00
0.0717		1.820	46.00	22.00
0.0720		1.830	46.00	22.00
0.0724		1.840	46.00	22.00
0.0728	49	1.850	46.00	22.00
0.0736		1.870	46.00	22.00
0.0748		1.900	46.00	22.00
0.0760	48	1.930	49.00	24.00
0.0768		1.950	49.00	24.00
0.0772		1.960	49.00	24.00
0.0776		1.970	49.00	24.00
0.0780	5/64	1.980	49.00	24.00
0.0783	47	1.990	49.00	24.00
0.0787		2.000	49.00	24.00
0.0795		2.020	49.00	24.00
0.0799		2.030	49.00	24.00
0.0807		2.050	49.00	24.00
0.0811	46	2.060	49.00	24.00
0.0819	45	2.080	49.00	24.00
0.0827		2.100	49.00	24.00
0.0846		2.150	53.00	27.00
0.0858	44	2.180	53.00	27.00
0.0866		2.200	53.00	27.00
0.0886		2.250	53.00	27.00
0.0890	43	2.260	53.00	27.00
0.0906		2.300	53.00	27.00
0.0925		2.350	53.00	27.00
0.0933	42	2.370	57.00	30.00
0.0937	3/32	2.380	57.00	30.00
0.0945		2.400	57.00	30.00
0.0961	41	2.440	57.00	30.00
0.0965		2.450	57.00	30.00
0.0980	40	2.490	57.00	30.00
0.0984		2.500	57.00	30.00
0.0996	39	2.530	57.00	30.00
0.1004		2.550	57.00	30.00
0.1016	38	2.580	57.00	30.00
0.1024		2.600	57.00	30.00
0.1039	37	2.640	57.00	30.00
0.1043		2.650	57.00	30.00
0.1063		2.700	61.00	33.00
0.1067	36	2.710	61.00	33.00
0.1083		2.750	61.00	33.00
0.1094	7/64	2.780	61.00	33.00
0.1098	35	2.790	61.00	33.00
0.1102		2.800	61.00	33.00
0.1110	34	2.820	61.00	33.00
0.1122		2.850	61.00	33.00
0.1130	33	2.870	61.00	33.00
0.1142		2.900	61.00	33.00
0.1161	32	2.950	61.00	33.00
0.1181		3.000	61.00	33.00
0.1201	31	3.050	65.00	36.00
0.1220		3.100	65.00	36.00
0.1240		3.150	65.00	36.00
0.1248	1/8	3.170	65.00	36.00

Diameter (d1)		I1	I2	EDP #
Dec. inch	Fract. inch			
0.1260		3.200	65.00	36.00
0.1280		3.250	65.00	36.00
0.1283	30	3.260	65.00	36.00
0.1299		3.300	65.00	36.00
0.1319		3.350	65.00	36.00
0.1339		3.400	70.00	39.00
0.1358	29	3.450	70.00	39.00
0.1378		3.500	70.00	39.00
0.1398		3.550	70.00	39.00
0.1406	9/64	3.570	70.00	39.00
0.1417		3.600	70.00	39.00
0.1437		3.650	70.00	39.00
0.1441	27	3.660	70.00	39.00
0.1457		3.700	70.00	39.00
0.1469	26	3.730	70.00	39.00
0.1476		3.750	70.00	39.00
0.1496	25	3.800	75.00	43.00
0.1516		3.850	75.00	43.00
0.1520	24	3.860	75.00	43.00
0.1535		3.900	75.00	43.00
0.1539	23	3.910	75.00	43.00
0.1555		3.950	75.00	43.00
0.1563	5/32	3.970	75.00	43.00
0.1571	22	3.990	75.00	43.00
0.1575		4.000	75.00	43.00
0.1591	21	4.040	75.00	43.00
0.1594		4.050	75.00	43.00
0.1610	20	4.090	75.00	43.00
0.1614		4.100	75.00	43.00
0.1634		4.150	75.00	43.00
0.1654		4.200	75.00	43.00
0.1661	19	4.220	75.00	43.00
0.1673		4.250	75.00	43.00
0.1693	18	4.300	80.00	47.00
0.1713		4.350	80.00	47.00
0.1720	11/64	4.370	80.00	47.00
0.1728	17	4.390	80.00	47.00
0.1732		4.400	80.00	47.00
0.1752		4.450	80.00	47.00
0.1772	16	4.500	80.00	47.00
0.1799	15	4.570	80.00	47.00
0.1811		4.600	80.00	47.00
0.1819	14	4.620	80.00	47.00
0.1831		4.650	80.00	47.00
0.1850	13	4.700	80.00	47.00
0.1870		4.750	80.00	47.00
0.1874	3/16	4.760	86.00	52.00
0.1890	12	4.800	86.00	52.00
0.1909	11	4.850	86.00	52.00
0.1929		4.900	86.00	52.00
0.1937	10	4.920	86.00	52.00
0.1949		4.950	86.00	52.00
0.1961	9	4.980	86.00	52.00
0.1969		5.000	86.00	52.00
0.1988		5.050	86.00	52.00
0.1992	8	5.060	86.00	52.00
0.2008		5.100	86.00	52.00
0.2012	7	5.110	86.00	52.00
0.2031	13/64	5.160	86.00	52.00
0.2039	6	5.180	86.00	52.00
0.2047		5.200	86.00	52.00
0.2055	5	5.220	86.00	52.00
0.2067		5.250	86.00	52.00
0.2087		5.300	86.00	52.00
0.2091	4	5.310	93.00	57.00
0.2126		5.400	93.00	57.00
0.2130	3	5.410	93.00	57.00
0.2146		5.450	93.00	57.00
0.2165		5.500	93.00	57.00
0.2189	7/32	5.560	93.00	57.00
0.2205		5.600	93.00	57.00

*Items listed in red are non-stocked items, and may take 2 - 6 weeks to receive

Series 651

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Twist Drills

Dec. inch	Diameter (d1)		I1 mm	I2 mm	EDP #
	Fract. inch	Wire / letter			
0.2209		2	5.610	93.00	9006510056100
0.2224			5.650	93.00	9006510056500
0.2244			5.700	93.00	9006510057000
0.2264			5.750	93.00	9006510057500
0.2280		1	5.790	93.00	9006510057900
0.2283			5.800	93.00	9006510058000
0.2323			5.900	93.00	9006510059000
0.2339		A	5.940	93.00	9006510059400
0.2343	15/64		5.950	93.00	9006510059500
0.2362			6.000	93.00	9006510060000
0.2378		B	6.040	101.00	9006510060400
0.2382			6.050	101.00	9006510060500
0.2402			6.100	101.00	9006510061000
0.2421		C	6.150	101.00	9006510061500
0.2441			6.200	101.00	9006510062000
0.2461		D	6.250	101.00	9006510062500
0.2480			6.300	101.00	9006510063000
0.2500	1/4	E	6.350	101.00	9006510063500
0.2520			6.400	101.00	9006510064000
0.2559			6.500	101.00	9006510065000
0.2571		F	6.530	101.00	9006510065300
0.2598			6.600	101.00	9006510066000
0.2610		G	6.630	101.00	9006510066300
0.2638			6.700	101.00	9006510067000
0.2657	17/64	H	6.750	109.00	9006510067500
0.2677			6.800	109.00	9006510068000
0.2697			6.850	109.00	9006510068500
0.2717		I	6.900	109.00	9006510069000
0.2756			7.000	109.00	9006510070000
0.2768		J	7.030	109.00	9006510070300
0.2795			7.100	109.00	9006510071000
0.2811	9/32	K	7.140	109.00	9006510071400
0.2835			7.200	109.00	9006510072000
0.2854			7.250	109.00	9006510072500
0.2874			7.300	109.00	9006510073000
0.2902		L	7.370	109.00	9006510073700
0.2913			7.400	109.00	9006510074000
0.2933			7.450	109.00	9006510074500
0.2949		M	7.490	109.00	9006510074900
0.2953			7.500	109.00	9006510075000
0.2969	19/64		7.540	117.00	9006510075400
0.2992			7.600	117.00	9006510076000
0.3020		N	7.670	117.00	9006510076700
0.3031			7.700	117.00	9006510077000
0.3051			7.750	117.00	9006510077500
0.3071			7.800	117.00	9006510078000
0.3110			7.900	117.00	9006510079000
0.3126	5/16		7.940	117.00	9006510079400
0.3150			8.000	117.00	9006510080000
0.3161		O	8.030	117.00	9006510080300
0.3189			8.100	117.00	9006510081000
0.3228		P	8.200	117.00	9006510082000
0.3248			8.250	117.00	9006510082500
0.3268			8.300	117.00	9006510083000
0.3280	21/64		8.330	117.00	9006510083300
0.3307			8.400	117.00	9006510084000
0.3319		Q	8.430	117.00	9006510084300
0.3346			8.500	117.00	9006510085000
0.3386			8.600	125.00	9006510086000
0.3390		R	8.610	125.00	9006510086100
0.3425			8.700	125.00	9006510087000
0.3437	11/32		8.730	125.00	9006510087300
0.3445			8.750	125.00	9006510087500
0.3465			8.800	125.00	9006510088000
0.3480		S	8.840	125.00	9006510088400
0.3484			8.850	125.00	9006510088500
0.3504			8.900	125.00	9006510089000
0.3543			9.000	125.00	9006510090000
0.3579		T	9.090	125.00	9006510090900
0.3583			9.100	125.00	9006510091000
0.3594	23/64		9.130	125.00	9006510091300

Dec. inch	Diameter (d1)		I1 mm	I2 mm	EDP #
	Fract. inch	Wire / letter			
0.3622			9.200	125.00	9006510092000
0.3642			9.250	125.00	9006510092500
0.3661			9.300	125.00	9006510093000
0.3677		U	9.340	125.00	9006510093400
0.3701			9.400	125.00	9006510094000
0.3740			9.500	125.00	9006510095000
0.3748	3/8		9.520	133.00	9006510095200
0.3760			9.550	133.00	9006510095500
0.3772		V	9.580	133.00	9006510095800
0.3780			9.600	133.00	9006510096000
0.3819			9.700	133.00	9006510097000
0.3839			9.750	133.00	9006510097500
0.3858		W	9.800	133.00	9006510098000
0.3898			9.900	133.00	9006510099000
0.3906	25/64		9.920	133.00	9006510099200
0.3937			10.000	133.00	9006510100000
0.3961			10.060	133.00	9006510100600
0.3969		X	10.080	133.00	9006510100800
0.3976			10.100	133.00	9006510101000
0.4016			10.200	133.00	9006510102000
0.4035			10.250	133.00	9006510102500
0.4039		Y	10.260	133.00	9006510102600
0.4055			10.300	133.00	9006510103000
0.4063	13/32		10.320	133.00	9006510103200
0.4094			10.400	133.00	9006510104000
0.4130		Z	10.490	133.00	9006510104900
0.4134			10.500	133.00	9006510105000
0.4154			10.550	133.00	9006510105500
0.4173			10.600	133.00	9006510106000
0.4213			10.700	142.00	9006510107000
0.4220	27/64		10.720	142.00	9006510107200
0.4232			10.750	142.00	9006510107500
0.4252			10.800	142.00	9006510108000
0.4291			10.900	142.00	9006510109000
0.4331			11.000	142.00	9006510110000
0.4370			11.100	142.00	9006510111000
0.4374	7/16		11.110	142.00	9006510111100
0.4409			11.200	142.00	9006510112000
0.4429			11.250	142.00	9006510112500
0.4449			11.300	142.00	9006510113000
0.4488			11.400	142.00	9006510114000
0.4528			11.500	142.00	9006510115000
0.4531	29/64		11.510	142.00	9006510115100
0.4587			11.650	142.00	9006510116500
0.4606			11.700	142.00	9006510117000
0.4646			11.800	142.00	9006510118000
0.4689	15/32		11.910	151.00	9006510119100
0.4724			12.000	151.00	9006510120000
0.4764			12.100	151.00	9006510121000
0.4803			12.200	151.00	9006510122000
0.4843	31/64		12.300	151.00	9006510123000
0.4882			12.400	151.00	9006510124000
0.4921			12.500	151.00	9006510125000
0.4961			12.600	151.00	9006510126000
0.5000	1/2		12.700	151.00	9006510127000
0.5039			12.800	151.00	9006510128000
0.5079			12.900	151.00	9006510129000
0.5118			13.000	151.00	9006510130000
0.5157	33/64		13.100	151.00	9006510131000
0.5197			13.200	151.00	9006510132000
0.5217			13.250	160.00	9006510132500
0.5311	17/32		13.490	160.00	9006510134900
0.5315			13.500	160.00	9006510135000
0.5394			13.700	160.00	9006510137000
0.5433			13.800	160.00	9006510138000
0.5469	35/64		13.890	160.00	9006510138900
0.5472			13.900	160.00	9006510139000
0.5512			14.000	160.00	9006510140000
0.5591			14.200	169.00	9006510142000
0.5610			14.250	169.00	9006510142500
0.5626	9/16		14.290	169.00	9006510142900

Series 651

Speeds & Feeds information pg 446

Diameter (d1)			I1 mm	I2 mm	EDP #	
Dec. inch	Fract. inch	Wire / letter				
0.5709	37/64		14.500	169.00	114.00	9006510145000
0.5748			14.600	169.00	114.00	9006510146000
0.5780			14.680	169.00	114.00	9006510146800
0.5807			14.750	169.00	114.00	9006510147500
0.5827	19/32		14.800	169.00	114.00	9006510148000
0.5906			15.000	169.00	114.00	9006510150000
0.5937			15.080	178.00	120.00	9006510150800
0.6004			15.250	178.00	120.00	9006510152500
0.6094	39/64		15.480	178.00	120.00	9006510154800
0.6102			15.500	178.00	120.00	9006510155000
0.6201			15.750	178.00	120.00	9006510157500
0.6220			15.800	178.00	120.00	9006510158000
0.6248	5/8		15.870	178.00	120.00	9006510158700
0.6299			16.000	178.00	120.00	9006510160000

Dec. inch	Diameter (d1)		I1 mm	I2 mm	EDP #	
	Fract. inch	Wire / letter				
0.6594			16.750	184.00	125.00	9006510167500
0.6693			17.000	184.00	125.00	9006510170000
0.6890			17.500	191.00	130.00	9006510175000
0.7087			18.000	191.00	130.00	9006510180000
0.7283			18.500	198.00	135.00	9006510185000
0.7480			19.000	198.00	135.00	9006510190000

Alternative Drill Series:

#205 HSS, GT100, 5xD, 118 pt, Bright/Steam Oxide > 2.36
 #5519, Cobalt, GU 500, 5xD, 130 pt., TiN
 #305 Cobalt, GP, 5xD, 118 pt, Bright/Steam Oxide > 2.36
 #530 PM Cobalt, GT500, 5xD, 130 pt, FIREX®

*Items listed in red are non-stocked items, and may take 2 - 6 weeks to receive

Series # 622

Material group	Hardness	SFM	Feed Rate - IPR									
			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	≤100 Bhn >100-260 Bhn	• •	• •	• •	• •	• •	• •	• •	• •	• •	• •	• •
Free-cutting steels	≤24 Rc >24-30 Rc	• 90	• 0.0015	• 0.0040	• 0.0065	• 0.0080	• 0.0100	• •	• •	• •	• •	• •
Unalloyed heat-treatable steels	≤16 Rc 16-24 Rc 24-30 Rc	• 90 45	• 0.0015 0.0012	• 0.0040 0.0030	• 0.0065 0.0050	• 0.0080 0.0065	• 0.0100 0.0080	• • •	• • •	• • •	• • •	• • •
Alloyed heat-treatable steels	24-30 Rc >30-38 Rc	55 45	0.0012 0.0010	0.0030 0.0025	0.0050 0.0040	0.0065 0.0050	0.0080 0.0065	• •	• •	• •	• •	• •
Unalloyed case hardened steels	≤230 Bhn	•	•	•	•	•	•	•	•	•	•	•
Alloyed case hardened steels	24-30 Rc >30-38 Rc	50 35	0.0012 0.0010	0.0030 0.0025	0.0050 0.0040	0.0065 0.0050	0.0080 0.0065	• •	• •	• •	• •	• •
Nitriding steels	≥24-30 Rc >30-38 Rc	45 30	0.0012 0.0010	0.0030 0.0025	0.0050 0.0040	0.0065 0.0050	0.0080 0.0065	• •	• •	• •	• •	• •
Tool steels	≤24 Rc >24-30 Rc	55 30	0.0012 0.0010	0.0030 0.0025	0.0050 0.0040	0.0065 0.0050	0.0080 0.0065	• •	• •	• •	• •	• •
High speed steels	≥14-30 Rc	30	0.0010	0.0025	0.0040	0.0050	0.0065	•	•	•	•	•
Spring steels	≤330 Bhn	•	•	•	•	•	•	•	•	•	•	•
Stainless steels, sulphured austenitic martensitic	≤24 Rc • ≤24 Rc	45 • 35	0.0012 • 0.0010	0.0030 • 0.0025	0.0050 • 0.0040	0.0065 • 0.0050	0.0080 • 0.0065	• • •	• • •	• • •	• • •	• • •
Hardened steels	≤40-48 Rc >48-60 Rc	• •	• •	• •	• •	• •	• •	• •	• •	• •	• •	• •
Special alloys	≤38 Rc	•	•	•	•	•	•	•	•	•	•	•
Cast iron	≤240 Bhn <300 Bhn	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	≤240 Bhn <300 Bhn	95 70	0.0017 0.0017	0.0050 0.0050	0.0080 0.0080	0.0100 0.0100	0.0125 0.0125	• •	• •	• •	• •	• •
Chilled cast iron	≤350 Bhn	25	0.0010	0.0025	0.0040	0.0050	0.0065	•	•	•	•	•
Ti and Ti-alloys	≤24 Rc >24-38 Rc	• •	• •	• •	• •	• •	• •	• •	• •	• •	• •	• •
Aluminium and Al-alloys	≤120 Bhn	•	•	•	•	•	•	•	•	•	•	•
Al wrought alloys	≤150 Bhn	•	•	•	•	•	•	•	•	•	•	•
Al cast alloys ≤ 10 % Si > 10 % Si	≤200 Bhn ≤200 Bhn	225 180	0.0020 0.0017	0.0065 0.0050	0.0100 0.0080	0.0125 0.0100	0.0160 0.0125	• •	• •	• •	• •	• •
Magnesium alloys	≤150 Bhn	•	•	•	•	•	•	•	•	•	•	•
Copper, low-alloyed	≤120 Bhn	115	0.0015	0.0040	0.0065	0.0080	0.0100	•	•	•	•	•
Brass, short-chipping long-chipping	≤200 Bhn ≤200 Bhn	• 145	• 0.0015	• 0.0040	• 0.0065	• 0.0080	• 0.0100	• •	• •	• •	• •	• •
Bronze, short-chipping	≤200 Bhn >200-260 Bhn	• •	• •	• •	• •	• •	• •	• •	• •	• •	• •	• •
Bronze, long-chipping	≤24 Rc >24-30 Rc	90 70	0.0012 0.0012	0.0030 0.0030	0.0050 0.0050	0.0065 0.0065	0.0080 0.0080	• •	• •	• •	• •	• •
Duroplastics Thermoplastics	- -	55 •	0.0012 •	0.0030 •	0.0050 •	0.0065 •	0.0080 •	• •	• •	• •	• •	• •
Reinforced plastics - Kevlar	-	•	•	•	•	•	•	•	•	•	•	•
Reinforced plastics - GFK / CFK	-	•	•	•	•	•	•	•	•	•	•	•

Series # 651

Material group	Hardness	SFM	Feed Rate - IPR									
			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	≤100 Bhn >100-260 Bhn	130 100	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	• •	• •	• •
Free-cutting steels	≤24 Rc >24-30 Rc	130 100	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	• •	• •	• •
Unalloyed heat-treatable steels	≤16 Rc 16-24 Rc 24-30 Rc	130 100 50	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	0.0100 0.0100 0.0080	0.0110 0.0110 0.0090	• • •	• • •	• • •
Alloyed heat-treatable steels	24-30 Rc >30-38 Rc	65 •	0.0012 •	0.0030 •	0.0050 •	0.0065 •	0.0080 •	0.0080 •	0.0090 •	• •	• •	• •
Unalloyed case hardened steels	≤230 Bhn	130	0.0017	0.0050	0.0080	0.0100	0.0125	0.0125	0.0140	•	•	•
Alloyed case hardened steels	24-30 Rc >30-38 Rc	55 •	0.0012 •	0.0030 •	0.0050 •	0.0065 •	0.0080 •	0.0080 •	0.0090 •	• •	• •	• •
Nitriding steels	≥24-30 Rc >30-38 Rc	45 •	0.0012 •	0.0030 •	0.0050 •	0.0065 •	0.0080 •	0.0080 •	0.0090 •	• •	• •	• •
Tool steels	≤24 Rc >24-30 Rc	65 •	0.0012 •	0.0030 •	0.0050 •	0.0065 •	0.0080 •	0.0080 •	0.0090 •	• •	• •	• •
High speed steels	≥14-30 Rc	•	•	•	•	•	•	•	•	•	•	•
Spring steels	≤330 Bhn	•	•	•	•	•	•	•	•	•	•	•
Stainless steels, sulphured austenitic martensitic	≤24 Rc • ≤24 Rc	• • •	• • •	• • •	• • •	• • •	• • •	• • •	• • •	• • •	• • •	• • •
Hardened steels	≤40-48 Rc >48-60 Rc	• •	• •	• •	• •	• •	• •	• •	• •	• •	• •	• •
Special alloys	≤38 Rc	•	•	•	•	•	•	•	•	•	•	•
Cast iron	≤240 Bhn <300 Bhn	130 100	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	≤240 Bhn <300 Bhn	115 80	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	≤350 Bhn	•	•	•	•	•	•	•	•	•	•	•
Ti and Ti-alloys	≤24 Rc >24-38 Rc	• •	• •	• •	• •	• •	• •	• •	• •	• •	• •	• •
Aluminium and Al-alloys	≤120 Bhn	•	•	•	•	•	•	•	•	•	•	•
Al wrought alloys	≤150 Bhn	•	•	•	•	•	•	•	•	•	•	•
Al cast alloys ≤ 10 % Si > 10 % Si	≤200 Bhn ≤200 Bhn	260 225	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	• •	• •	• •
Magnesium alloys	≤150 Bhn	325	0.0017	0.0050	0.0080	0.0100	0.0125	0.0125	0.0140	•	•	•
Copper, low-alloyed	≤120 Bhn	130	0.0015	0.0040	0.0065	0.0080	0.0100	0.0100	0.0110	•	•	•
Brass, short-chipping long-chipping	≤200 Bhn ≤200 Bhn	• 160	• 0.0015	• 0.0040	• 0.0065	• 0.0080	• 0.0100	• 0.0100	• 0.0110	• •	• •	• •
Bronze, short-chipping	≤200 Bhn >200-260 Bhn	130 115	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	• •	• •	• •
Bronze, long-chipping	≤24 Rc >24-30 Rc	100 80	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 Thermoplastics	- -	65 100	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	• •	• •	• •
Reinforced plastics - Kevlar	-	•	•	•	•	•	•	•	•	•	•	•
Reinforced plastics - GFK / CFK	-	•	•	•	•	•	•	•	•	•	•	•