

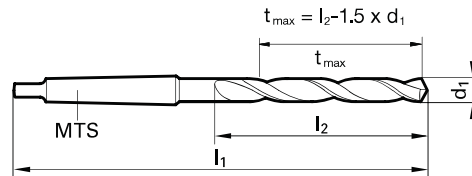


Tool material **HSS**

Surface **S**

P Steel	•	web thinning $\geq \varnothing 3.000$ • relieved cone
M Stainless steel		
K Cast iron	•	alloyed/unalloyed steel and cast steel • grey cast iron, malleable and spheroidal iron • sintered powder metal, German silver and graphite
N Aluminum	○	
S Titanium alloys		
H Hardened steel		

•=Optimal
○=Limited



Speeds and feeds information on pg. 516

Diameter (d ₁)			Shank Size	l ₁ mm	t _{max} mm	l ₂ mm	EDP #
inch	wire/ltr	mm					
0.1181		3.00	MTS 1	114.00	28.50	33.00	9006540030000
0.1720	11/64	4.37	MTS 1	128.00	40.45	47.00	9006540043700
0.1874	3/16	4.76	MTS 1	133.00	44.86	52.00	9006540047600
0.2031	13/64	5.16	MTS 1	133.00	44.26	52.00	9006540051600
0.2559		6.50	MTS 1	144.00	53.25	63.00	9006540065000
0.2657	17/64	H 6.75	MTS 1	150.00	58.88	69.00	9006540067500
0.2811	9/32	K 7.14	MTS 1	150.00	58.29	69.00	9006540071400
0.2969	19/64	7.54	MTS 1	156.00	63.69	75.00	9006540075400
0.3031		7.70	MTS 1	156.00	63.45	75.00	9006540077000
0.3125	5/16	7.94	MTS 1	156.00	63.09	75.00	9006540079400
0.3150		8.00	MTS 1	156.00	63.00	75.00	9006540080000
0.3228	P	8.20	MTS 1	156.00	62.70	75.00	9006540082000
0.3280	21/64	8.33	MTS 1	156.00	62.51	75.00	9006540083300
0.3437	11/32	8.73	MTS 1	162.00	67.91	81.00	9006540087300
0.3750	3/8	9.52	MTS 1	168.00	72.72	87.00	9006540095200
0.3858	W	9.80	MTS 1	168.00	72.30	87.00	9006540098000
0.3937		10.00	MTS 1	168.00	72.00	87.00	9006540100000
0.4016		10.20	MTS 1	168.00	71.70	87.00	9006540102000
0.4035		10.25	MTS 1	168.00	71.63	87.00	9006540102500
0.4063	13/32	10.32	MTS 1	168.00	71.52	87.00	9006540103200
0.4134		10.50	MTS 1	168.00	71.25	87.00	9006540105000
0.4220	27/64	10.72	MTS 1	175.00	77.92	94.00	9006540107200
0.4252		10.80	MTS 1	175.00	77.80	94.00	9006540108000
0.4331		11.00	MTS 1	175.00	77.50	94.00	9006540110000
0.4374	7/16	11.11	MTS 1	175.00	77.34	94.00	9006540111100
0.4409		11.20	MTS 1	175.00	77.20	94.00	9006540112000
0.4429		11.25	MTS 1	175.00	77.13	94.00	9006540112500
0.4528		11.50	MTS 1	175.00	76.75	94.00	9006540115000
0.4531	29/64	11.51	MTS 1	175.00	76.74	94.00	9006540115100
0.4626		11.75	MTS 1	175.00	76.38	94.00	9006540117500
0.4646		11.80	MTS 1	175.00	76.30	94.00	9006540118000
0.4689	15/32	11.91	MTS 1	182.00	83.14	101.00	9006540119100
0.4724		12.00	MTS 1	182.00	83.00	101.00	9006540120000
0.4803		12.20	MTS 1	182.00	82.70	101.00	9006540122000
0.4823		12.25	MTS 1	182.00	82.63	101.00	9006540122500
0.4843	31/64	12.30	MTS 1	182.00	82.55	101.00	9006540123000
0.4921		12.50	MTS 1	182.00	82.25	101.00	9006540125000
0.5000	1/2	12.70	MTS 1	182.00	81.95	101.00	9006540127000
0.5020		12.75	MTS 1	182.00	81.88	101.00	9006540127500
0.5039		12.80	MTS 1	182.00	81.80	101.00	9006540128000
0.5118		13.00	MTS 1	182.00	81.50	101.00	9006540130000
0.5157	33/64	13.10	MTS 1	182.00	81.35	101.00	9006540131000

Diameter (d ₁)			Shank Size	l ₁ mm	t _{max} mm	l ₂ mm	EDP #
inch	wire/ltr	mm					
0.5217		13.25	MTS 1	189.00	88.13	108.00	9006540132500
0.5311	17/32	13.49	MTS 1	189.00	87.77	108.00	9006540134900
0.5315		13.50	MTS 1	189.00	87.75	108.00	9006540135000
0.5413		13.75	MTS 1	189.00	87.38	108.00	9006540137500
0.5469	35/64	13.89	MTS 1	189.00	87.17	108.00	9006540138900
0.5512		14.00	MTS 1	189.00	87.00	108.00	9006540140000
0.5591		14.20	MTS 2	212.00	92.70	114.00	9006540142000
0.5610		14.25	MTS 2	212.00	92.63	114.00	9006540142500
0.5626	9/16	14.29	MTS 2	212.00	92.57	114.00	9006540142900
0.5709		14.50	MTS 2	212.00	92.25	114.00	9006540145000
0.5748		14.60	MTS 2	212.00	92.10	114.00	9006540146000
0.5780	37/64	14.68	MTS 2	212.00	91.98	114.00	9006540146800
0.5807		14.75	MTS 2	212.00	91.88	114.00	9006540147500
0.5906		15.00	MTS 2	212.00	91.50	114.00	9006540150000
0.5937	19/32	15.08	MTS 2	218.00	97.38	120.00	9006540150800
0.5945		15.10	MTS 2	218.00	97.35	120.00	9006540151000
0.6004		15.25	MTS 2	218.00	97.13	120.00	9006540152500
0.6094	39/64	15.48	MTS 2	218.00	96.78	120.00	9006540154800
0.6102		15.50	MTS 2	218.00	96.75	120.00	9006540155000
0.6201		15.75	MTS 2	218.00	96.38	120.00	9006540157500
0.6250	5/8	15.87	MTS 2	218.00	96.20	120.00	9006540158700
0.6299		16.00	MTS 2	218.00	96.00	120.00	9006540160000
0.6398		16.25	MTS 2	223.00	100.63	125.00	9006540162500
0.6406	41/64	16.27	MTS 2	223.00	100.60	125.00	9006540162700
0.6496		16.50	MTS 2	223.00	100.25	125.00	9006540165000
0.6563	21/32	16.67	MTS 2	223.00	100.00	125.00	9006540166700
0.6594		16.75	MTS 2	223.00	99.88	125.00	9006540167500
0.6693		17.00	MTS 2	223.00	99.50	125.00	9006540170000
0.6720	43/64	17.07	MTS 2	228.00	104.40	130.00	9006540170700
0.6791		17.25	MTS 2	228.00	104.13	130.00	9006540172500
0.6874	11/16	17.46	MTS 2	228.00	103.81	130.00	9006540174600
0.6890		17.50	MTS 2	228.00	103.75	130.00	9006540175000
0.6988		17.75	MTS 2	228.00	103.38	130.00	9006540177500
0.7087		18.00	MTS 2	228.00	103.00	130.00	9006540180000
0.7185		18.25	MTS 2	233.00	107.63	135.00	9006540182500
0.7189	23/32	18.26	MTS 2	233.00	107.61	135.00	9006540182600
0.7283		18.50	MTS 2	233.00	107.25	135.00	9006540185000
0.7343	47/64	18.65	MTS 2	233.00	107.03	135.00	9006540186500
0.7382		18.75	MTS 2	233.00	106.88	135.00	9006540187500
0.7480		19.00	MTS 2	233.00	106.50	135.00	9006540190000
0.7500	3/4	19.05	MTS 2	238.00	111.43	140.00	9006540190500
0.7579		19.25	MTS 2	238.00	111.13	140.00	9006540192500

Morse Taper Length

Diameter (d ₁)			Shank Size	l ₁ mm	t _{max} mm	l ₂ mm	EDP #
inch	wire/ltr	mm					
0.7657	49/64	19.45	MTS 2	238.00	110.83	140.00	9006540194500
0.7677		19.50	MTS 2	238.00	110.75	140.00	9006540195000
0.7776		19.75	MTS 2	238.00	110.38	140.00	9006540197500
0.7811	25/32	19.84	MTS 2	238.00	110.24	140.00	9006540198400
0.7874		20.00	MTS 2	238.00	110.00	140.00	9006540200000
0.7972		20.25	MTS 2	243.00	114.63	145.00	9006540202500
0.8071		20.50	MTS 2	243.00	114.25	145.00	9006540205000
0.8126	13/16	20.64	MTS 2	243.00	114.04	145.00	9006540206400
0.8169		20.75	MTS 2	243.00	113.88	145.00	9006540207500
0.8268		21.00	MTS 2	243.00	113.50	145.00	9006540210000
0.8366		21.25	MTS 2	248.00	118.13	150.00	9006540212500
0.8437	27/32	21.43	MTS 2	248.00	117.86	150.00	9006540214300
0.8465		21.50	MTS 2	248.00	117.75	150.00	9006540215000
0.8563		21.75	MTS 2	248.00	117.38	150.00	9006540217500
0.8594	55/64	21.83	MTS 2	248.00	117.26	150.00	9006540218300
0.8661		22.00	MTS 2	248.00	117.00	150.00	9006540220000
0.8748	7/8	22.22	MTS 2	248.00	116.67	150.00	9006540222200
0.8858		22.50	MTS 2	253.00	121.25	155.00	9006540225000
0.9055		23.00	MTS 2	253.00	120.50	155.00	9006540230000
0.9252		23.50	MTS 3	276.00	119.75	155.00	9006540235000

Diameter (d ₁)			Shank Size	l ₁ mm	t _{max} mm	l ₂ mm	EDP #
inch	wire/ltr	mm					
0.9350		23.75	MTS 3	281.00	124.38	160.00	9006540237500
0.9374	15/16	23.81	MTS 3	281.00	124.29	160.00	9006540238100
0.9449		24.00	MTS 3	281.00	124.00	160.00	9006540240000
0.9646		24.50	MTS 3	281.00	123.25	160.00	9006540245000
0.9744		24.75	MTS 3	281.00	122.88	160.00	9006540247500
0.9843	63/64	25.00	MTS 3	281.00	122.50	160.00	9006540250000
1.0000	1.0000	25.40	MTS 3	286.00	126.90	165.00	9006540254000
1.0039		25.50	MTS 3	286.00	126.75	165.00	9006540255000
1.0236		26.00	MTS 3	286.00	126.00	165.00	9006540260000
1.0433		26.50	MTS 3	286.00	125.25	165.00	9006540265000
1.0625	1 1/16	26.99	MTS 3	291.00	129.52	170.00	9006540269900
1.0630		27.00	MTS 3	291.00	129.50	170.00	9006540270000
1.1024		28.00	MTS 3	291.00	128.00	170.00	9006540280000
1.1220		28.50	MTS 3	296.00	132.25	175.00	9006540285000
1.1252	1 1/8	28.57	MTS 3	296.00	132.15	175.00	9006540285700
1.1417		29.00	MTS 3	296.00	131.50	175.00	9006540290000
1.1614		29.50	MTS 3	296.00	130.75	175.00	9006540295000
1.1713		29.75	MTS 3	296.00	130.38	175.00	9006540297500
1.2008		30.50	MTS 3	301.00	134.25	180.00	9006540305000

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	145 115	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	0.0200 0.0160	
Free-cutting steels	≤ 25 ≤ 32	≤ 255 ≤ 301	145 115	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	0.0200 0.0160	
Unalloyed heat-treatable steels	≤ 20 ≤ 25 ≤ 32	≤ 220 ≤ 255 ≤ 301	145 100 55	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	0.0125 0.0125 0.0100	0.0160 0.0160 0.0125	
Alloyed heat-treatable steels	≤ 32 ≤ 43	≤ 301 ≤ 402	70	0.0012	0.0030	0.0050	0.0065	0.0080	0.0080	0.0090	0.0100	0.0125	
Unalloyed case hardened steels	≤ 25	≤ 255	145	0.0017	0.0050	0.0080	0.0100	0.0125	0.0125	0.0140	0.0160	0.0200	
Alloyed case hardened steels	≤ 32 ≤ 43	≤ 301 ≤ 402	65	0.0012	0.0030	0.0050	0.0065	0.0080	0.0080	0.0090	0.0100	0.0125	
Nitriding steels	≤ 32 ≤ 43	≤ 301 ≤ 402	55	0.0012	0.0030	0.0050	0.0065	0.0080	0.0080	0.0090	0.0100	0.0125	
Tool steels	≤ 25 ≤ 43	≤ 255 ≤ 402	70	0.0012	0.0030	0.0050	0.0065	0.0080	0.0080	0.0090	0.0100	0.0125	
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	145 115	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	0.0200 0.0200	
Spheroidal graphite iron and malleable cast iron	≤ 23 ≤ 38	≤ 242 ≤ 354	130 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	0.0160 0.0160	0.0200 0.0200	
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	295 260	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	0.0245 0.0200	
Magnesium alloys	-	≤ 120											
Copper, low-alloyed	-	≤ 150	145	0.0015	0.0040	0.0065	0.0080	0.0100	0.0100	0.0110	0.0125	0.0160	
Brass, short-chipping long-chipping	- -	≤ 180 ≤ 180	180	0.0015	0.0040	0.0065	0.0080	0.0100	0.0100	0.0110	0.0125	0.0160	
Bronze, short-chipping	-	≤ 180	145	0.0012	0.0030	0.0050	0.0065	0.0080	0.0080	0.0090	0.0100	0.0125	
Bronze, long-chipping	≤ 25 ≤ 32	≤ 255 ≤ 301	130 110 90	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	0.0100 0.0100	0.0125 0.0125	
Duroplastics Thermoplastics Reinforced plastics - Kevlar Reinforced plastics - GFK / CFK			70 115	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	0.0125 0.0160	

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	130 100		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	0.0200 0.0160	
Free-cutting steels	≤ 25 ≤ 32	≤ 255 ≤ 301	130 100		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	0.0200 0.0160	
Unalloyed heat-treatable steels	≤ 20 ≤ 25 ≤ 32	≤ 220 ≤ 255 ≤ 301	130 100 50		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	0.0125 0.0125 0.0100	0.0160 0.0160 0.0125	
Alloyed heat-treatable steels	≤ 32 ≤ 43	≤ 301 ≤ 402	65		0.0030	0.0050	0.0065	0.0080	0.0080	0.0090	0.0100	0.0125	
Unalloyed case hardened steels	≤ 25	≤ 255	130		0.0050	0.0080	0.0100	0.0125	0.0125	0.0140	0.0160	0.0200	
Alloyed case hardened steels	≤ 32 ≤ 43	≤ 301 ≤ 402	55		0.0030	0.0050	0.0065	0.0080	0.0080	0.0090	0.0100	0.0125	
Nitriding steels	≤ 32 ≤ 43	≤ 301 ≤ 402	45		0.0030	0.0050	0.0065	0.0080	0.0080	0.0090	0.0100	0.0125	
Tool steels	≤ 25 ≤ 43	≤ 255 ≤ 402	65		0.0030	0.0050	0.0065	0.0080	0.0080	0.0090	0.0100	0.0125	
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	130 100		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	0.0200 0.0200	
Spheroidal graphite iron and malleable cast iron	≤ 23 ≤ 38	≤ 242 ≤ 354	115 80		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	0.0200 0.0200	
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	260 225		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	0.0245 0.0200	
Magnesium alloys	-	≤ 120	325		0.0050	0.0080	0.0100	0.0125	0.0125	0.0140	0.0160	0.0200	
Copper, low-alloyed	-	≤ 150	130		0.0040	0.0065	0.0080	0.0100	0.0100	0.0110	0.0125	0.0160	
Brass, short-chipping long-chipping	- -	≤ 180 ≤ 180	160		0.0040	0.0065	0.0080	0.0100	0.0100	0.0110	0.0125	0.0160	
Bronze, short-chipping	-	≤ 180	130		0.0030	0.0050	0.0065	0.0080	0.0080	0.0090	0.0100	0.0125	
Bronze, long-chipping	≤ 25 ≤ 32	≤ 255 ≤ 301	100 80		0.0030 0.0030	0.0050 0.0050	0.0065 0.0065	0.0080 0.0080	0.0080 0.0080	0.0090 0.0090	0.0100 0.0100	0.0125 0.0125	
Duroplastics Thermoplastics Reinforced plastics - Kevlar Reinforced plastics - GFK / CFK			65 100		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	0.0125 0.0160	