

Tool material

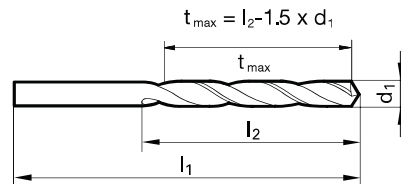
HSS-E-PM

Surface



P Steel	●	web thinning $\geq \varnothing 1.000$ • relieved cone • PM-Co-alloyed high speed steel • especially high rigidity • especially high wear resistance
M Stainless steel	○	
K Cast iron	●	
N Aluminum	○	high-alloyed steels • heat treatable and case hardened steels
S Titanium alloys	○	• cast iron, brass, bronze
H Hardened steel	○	

●=Optimal
○=Limited



Speeds and feeds information on pg. 555

Shank diameter = cut diameter

Diameter (d ₁)			l ₁ mm	t _{max} mm	l ₂ mm	EDP #
inch	wire/ltr	mm				
0.0394		1.00	34.00	10.50	12.00	9055220010000
0.0433		1.10	36.00	12.35	14.00	9055220011000
0.0472		1.20	38.00	14.20	16.00	9055220012000
0.0512		1.30	38.00	14.05	16.00	9055220013000
0.0551	#54	1.40	40.00	15.90	18.00	9055220014000
0.0591		1.50	40.00	15.75	18.00	9055220015000
0.0626	1/16	1.59	43.00	17.62	20.00	9055220015900
0.0630		1.60	43.00	17.60	20.00	9055220016000
0.0669	#51	1.70	43.00	17.45	20.00	9055220017000
0.0709		1.80	46.00	19.30	22.00	9055220018000
0.0748		1.90	46.00	19.15	22.00	9055220019000
0.0780	5/64	1.98	49.00	21.03	24.00	9055220019800
0.0787		2.00	49.00	21.00	24.00	9055220020000
0.0827		2.10	49.00	20.85	24.00	9055220021000
0.0866		2.20	53.00	23.70	27.00	9055220022000
0.0906		2.30	53.00	23.55	27.00	9055220023000
0.0937	3/32	2.38	57.00	26.43	30.00	9055220023800
0.0945		2.40	57.00	26.40	30.00	9055220024000
0.0984		2.50	57.00	26.25	30.00	9055220025000
0.1024		2.60	57.00	26.10	30.00	9055220026000
0.1063		2.70	61.00	28.95	33.00	9055220027000
0.1094	7/64	2.78	61.00	28.83	33.00	9055220027800
0.1102		2.80	61.00	28.80	33.00	9055220028000
0.1142		2.90	61.00	28.65	33.00	9055220029000
0.1181		3.00	61.00	28.50	33.00	9055220030000
0.1220		3.10	65.00	31.35	36.00	9055220031000
0.1248	1/8	3.17	65.00	31.25	36.00	9055220031700
0.1260		3.20	65.00	31.20	36.00	9055220032000
0.1299		3.30	65.00	31.05	36.00	9055220033000
0.1339		3.40	70.00	33.90	39.00	9055220034000
0.1378		3.50	70.00	33.75	39.00	9055220035000
0.1406	9/64	3.57	70.00	33.65	39.00	9055220035700
0.1417		3.60	70.00	33.60	39.00	9055220036000
0.1457		3.70	70.00	33.45	39.00	9055220037000
0.1496	#25	3.80	75.00	37.30	43.00	9055220038000
0.1535		3.90	75.00	37.15	43.00	9055220039000
0.1563	5/32	3.97	75.00	37.05	43.00	9055220039700
0.1575		4.00	75.00	37.00	43.00	9055220040000
0.1614		4.10	75.00	36.85	43.00	9055220041000
0.1654		4.20	75.00	36.70	43.00	9055220042000
0.1693	#18	4.30	80.00	40.55	47.00	9055220043000
0.1720	11/64	4.37	80.00	40.45	47.00	9055220043700

Diameter (d ₁)			l ₁ mm	t _{max} mm	l ₂ mm	EDP #
inch	wire/ltr	mm				
0.1732		4.40	80.00	40.40	47.00	9055220044000
0.1772	#16	4.50	80.00	40.25	47.00	9055220045000
0.1811		4.60	80.00	40.10	47.00	9055220046000
0.1850	#13	4.70	80.00	39.95	47.00	9055220047000
0.1874	3/16	4.76	86.00	44.86	52.00	9055220047600
0.1890	#12	4.80	86.00	44.80	52.00	9055220048000
0.1929		4.90	86.00	44.65	52.00	9055220049000
0.1969		5.00	86.00	44.50	52.00	9055220050000
0.2008		5.10	86.00	44.35	52.00	9055220051000
0.2031	13/64	5.16	86.00	44.26	52.00	9055220051600
0.2047		5.20	86.00	44.20	52.00	9055220052000
0.2087		5.30	86.00	44.05	52.00	9055220053000
0.2126		5.40	93.00	48.90	57.00	9055220054000
0.2165		5.50	93.00	48.75	57.00	9055220055000
0.2189	7/32	5.56	93.00	48.66	57.00	9055220055600
0.2205		5.60	93.00	48.60	57.00	9055220056000
0.2244		5.70	93.00	48.45	57.00	9055220057000
0.2283		5.80	93.00	48.30	57.00	9055220058000
0.2323		5.90	93.00	48.15	57.00	9055220059000
0.2343	15/64	5.95	93.00	48.08	57.00	9055220059500
0.2362		6.00	93.00	48.00	57.00	9055220060000
0.2402		6.10	101.00	53.85	63.00	9055220061000
0.2441		6.20	101.00	53.70	63.00	9055220062000
0.2480		6.30	101.00	53.55	63.00	9055220063000
0.2500	1/4	6.35	101.00	53.48	63.00	9055220063500
0.2520		6.40	101.00	53.40	63.00	9055220064000
0.2559		6.50	101.00	53.25	63.00	9055220065000
0.2598		6.60	101.00	53.10	63.00	9055220066000
0.2638		6.70	101.00	52.95	63.00	9055220067000
0.2657	17/64	6.75	109.00	58.88	69.00	9055220067500
0.2677		6.80	109.00	58.80	69.00	9055220068000
0.2717	I	6.90	109.00	58.65	69.00	9055220069000
0.2756		7.00	109.00	58.50	69.00	9055220070000
0.2795		7.10	109.00	58.35	69.00	9055220071000
0.2811	9/32	7.14	109.00	58.29	69.00	9055220071400
0.2835		7.20	109.00	58.20	69.00	9055220072000
0.2874		7.30	109.00	58.05	69.00	9055220073000
0.2913		7.40	109.00	57.90	69.00	9055220074000
0.2953		7.50	109.00	57.75	69.00	9055220075000
0.2969	19/64	7.54	117.00	63.69	75.00	9055220075400
0.2992		7.60	117.00	63.60	75.00	9055220076000
0.3031		7.70	117.00	63.45	75.00	9055220077000

Diameter (d ₁)			l ₁ mm	t _{max} mm	l ₂ mm	EDP #
inch	wire/ltr	mm				
0.3071		7.80	117.00	63.30	75.00	9055220078000
0.3110		7.90	117.00	63.15	75.00	9055220079000
0.3126	5/16	7.94	117.00	63.09	75.00	9055220079400
0.3150		8.00	117.00	63.00	75.00	9055220080000
0.3189		8.10	117.00	62.85	75.00	9055220081000
0.3228	P	8.20	117.00	62.70	75.00	9055220082000
0.3268		8.30	117.00	62.55	75.00	9055220083000
0.3280	21/64	8.33	117.00	62.51	75.00	9055220083300
0.3307		8.40	117.00	62.40	75.00	9055220084000
0.3346		8.50	117.00	62.25	75.00	9055220085000
0.3437	11/32	8.73	125.00	67.91	81.00	9055220087300
0.3465		8.80	125.00	67.80	81.00	9055220088000
0.3543		9.00	125.00	67.50	81.00	9055220090000
0.3594	23/64	9.13	125.00	67.31	81.00	9055220091300
0.3661		9.30	125.00	67.05	81.00	9055220093000
0.3740		9.50	125.00	66.75	81.00	9055220095000
0.3748	3/8	9.52	133.00	72.72	87.00	9055220095200
0.3858	W	9.80	133.00	72.30	87.00	9055220098000

Diameter (d ₁)			l ₁ mm	t _{max} mm	l ₂ mm	EDP #
inch	wire/ltr	mm				
0.3906	25/64	9.92	133.00	72.12	87.00	9055220099200
0.3937		10.00	133.00	72.00	87.00	9055220100000
0.4016		10.20	133.00	71.70	87.00	9055220102000
0.4063	13/32	10.32	133.00	71.52	87.00	9055220103200
0.4134		10.50	133.00	71.25	87.00	9055220105000
0.4220	27/64	10.72	142.00	77.92	94.00	9055220107200
0.4331		11.00	142.00	77.50	94.00	9055220110000
0.4374	7/16	11.11	142.00	77.34	94.00	9055220111100
0.4528		11.50	142.00	76.75	94.00	9055220115000
0.4689	15/32	11.91	151.00	83.14	101.00	9055220119100
0.4724		12.00	151.00	83.00	101.00	9055220120000
0.4843	31/64	12.30	151.00	82.55	101.00	9055220123000
0.4921		12.50	151.00	82.25	101.00	9055220125000
0.5000	1/2	12.70	151.00	81.95	101.00	9055220127000
0.5118		13.00	151.00	81.50	101.00	9055220130000
0.5315		13.50	160.00	87.75	108.00	9055220135000
0.5512		14.00	160.00	87.00	108.00	9055220140000

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	0.0017 0.0015	0.0050 0.0040	0.0080 0.0065	0.0100 0.0080	0.0125 0.0100	0.0125 0.0100				
Free-cutting steels	≤ 25 ≤ 32	≤ 255 ≤ 301	155 125	0.0017 0.0017	0.0050 0.0050	0.0080 0.0080	0.0100 0.0100	0.0125 0.0125	0.0125 0.0125				
Unalloyed heat-treatable steels	≤ 20 ≤ 25 ≤ 32	≤ 220 ≤ 255 ≤ 301	100 100 80	0.0017 0.0017 0.0015	0.0050 0.0050 0.0040	0.0080 0.0080 0.0065	0.0100 0.0100 0.0080	0.0125 0.0125 0.0100	0.0125 0.0125 0.0100				
Alloyed heat-treatable steels	≤ 32 ≤ 43	≤ 301 ≤ 402	80 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				
Unalloyed case hardened steels	≤ 25	≤ 255	100	0.0010	0.0025	0.0040	0.0050	0.0065	0.0065				
Alloyed case hardened steels	≤ 32 ≤ 43	≤ 301 ≤ 402	60 50	0.0012 0.0010	0.0030 0.0025	0.0050 0.0040	0.0065 0.0050	0.0080 0.0065	0.0080 0.0065				
Nitriding steels	≤ 32 ≤ 43	≤ 301 ≤ 402	45 50	0.0012 0.0010	0.0030 0.0025	0.0050 0.0040	0.0065 0.0050	0.0080 0.0065	0.0080 0.0065				
Tool steels	≤ 25 ≤ 43	≤ 255 ≤ 402	60 50	0.0012 0.0010	0.0030 0.0025	0.0050 0.0040	0.0065 0.0050	0.0080 0.0065	0.0080 0.0065				
High speed steels	≤ 43	≤ 402	50	0.0010	0.0025	0.0040	0.0050	0.0065	0.0065				
Spring steels	≤ 38	≤ 354	30	0.0007	0.0020	0.0030	0.0040	0.0050	0.0050				
Hardened steels	≤ 48 ≤ 66	≤ 460 -											
Stainless steels, sulphured austenitic martensitic	≤ 28 ≤ 36 ≤ 46	≤ 273 ≤ 337 ≤ 435	50 35 50	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				
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				
Spheroidal graphite iron and malleable cast iron	≤ 23 ≤ 38	≤ 242 ≤ 354	100 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				
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	30	0.0007	0.0020	0.0030	0.0040	0.0050	0.0050				
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	230 185	0.0020 0.0017	0.0065 0.0050	0.0100 0.0080	0.0125 0.0100	0.0160 0.0125	0.0160 0.0125				
Magnesium alloys	-	≤ 120	205	0.0017	0.0050	0.0080	0.0100	0.0125	0.0125				
Copper, low-alloyed	-	≤ 150											
Brass, short-chipping	-	≤ 180											
long-chipping	-	≤ 180											
Bronze, short-chipping	-	≤ 180											
Bronze, long-chipping	≤ 25 ≤ 32	≤ 255 ≤ 301											
Duroplastics 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	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				
Free-cutting steels	≤ 25 ≤ 32	≤ 255 ≤ 301	155 125	0.0017 0.0017	0.0050 0.0050	0.0080 0.0080	0.0100 0.0100	0.0125 0.0125	0.0125 0.0125				
Unalloyed heat-treatable steels	≤ 20 ≤ 25 ≤ 32	≤ 220 ≤ 255 ≤ 301	130 100 65	0.0017 0.0017 0.0015	0.0050 0.0050 0.0040	0.0080 0.0080 0.0065	0.0100 0.0100 0.0080	0.0125 0.0125 0.0100	0.0125 0.0125 0.0100				
Alloyed heat-treatable steels	≤ 32 ≤ 43	≤ 301 ≤ 402	55 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				
Unalloyed case hardened steels	≤ 25	≤ 255	100	0.0017	0.0050	0.0080	0.0100	0.0125	0.0125				
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				
Nitriding steels	≤ 32 ≤ 43	≤ 301 ≤ 402	45 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				
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				
High speed steels	≤ 43	≤ 402	30	0.0010	0.0025	0.0040	0.0050	0.0065	0.0065				
Spring steels	≤ 38	≤ 354											
Hardened steels	≤ 48 ≤ 66	≤ 460 -											
Stainless steels, sulphured austenitic martensitic	≤ 28 ≤ 36 ≤ 46	≤ 273 ≤ 337 ≤ 435	50 35 45	0.0012 0.0012 0.0012	0.0030 0.0030 0.0030	0.0050 0.0050 0.0050	0.0065 0.0065 0.0065	0.0080 0.0080 0.0080	0.0080 0.0080 0.0080				
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				
Spheroidal graphite iron and malleable cast iron	≤ 23 ≤ 38	≤ 242 ≤ 354	100 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				
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	180	0.0020	0.0065	0.0100	0.0125	0.0160	0.0160				
Al wrought alloys	-	≤ 200	180	0.0020	0.0065	0.0100	0.0125	0.0160	0.0160				
Al cast alloys ≤ 10 % Si ≤ 24 % Si	- -	≤ 180 ≤ 180	230 185	0.0020 0.0017	0.0065 0.0050	0.0100 0.0080	0.0125 0.0100	0.0160 0.0125	0.0160 0.0125				
Magnesium alloys	-	≤ 120	205	0.0017	0.0050	0.0080	0.0100	0.0125	0.0125				
Copper, low-alloyed	-	≤ 150	80	0.0015	0.0040	0.0065	0.0080	0.0100	0.0100				
Brass, short-chipping	-	≤ 180	165	0.0015	0.0040	0.0065	0.0080	0.0100	0.0100				
long-chipping	-	≤ 180	100	0.0015	0.0040	0.0065	0.0080	0.0100	0.0100				
Bronze, short-chipping	-	≤ 180	130	0.0012	0.0030	0.0050	0.0065	0.0080	0.0080				
Bronze, long-chipping	≤ 25 ≤ 32	≤ 255 ≤ 301	75 75	0.0012 0.0012	0.0030 0.0030	0.0050 0.0050	0.0065 0.0065	0.0080 0.0080	0.0080 0.0080				
Duroplastics Thermoplastics Reinforced plastics - Kevlar Reinforced plastics - GFK / CFK			65 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				