

Tool material

HSCO

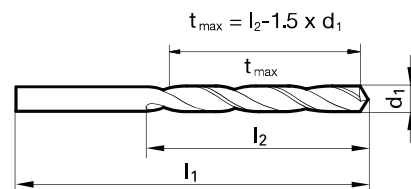
Surface



P Steel	•	web thinning $\geq \varnothing 1.000$ • facet split point • Co-alloyed high speed steel • low feed force required • low torque required • for universal application
M Stainless steel	•	
K Cast iron	•	alloyed/unalloyed steels up to 800 N/mm ² • cold/hot work steels • antifriction bearing steels • non-ferrous metals • cast materials • stainless steels • plastics
N Aluminum	•	
S Titanium alloys	•	
H Hardened steel	•	

●=Optimal

○=Limited



Speeds and feeds information on pg. 553

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	9055190010000
0.0402		1.02	34.00	10.47	12.00	9055190010200
0.0409		1.04	34.00	10.44	12.00	9055190010400
0.0421		1.07	36.00	12.40	14.00	9055190010700
0.0429		1.09	36.00	12.37	14.00	9055190010900
0.0433		1.10	36.00	12.35	14.00	9055190011000
0.0465		1.18	36.00	12.23	14.00	9055190011800
0.0469	3/64	1.19	38.00	14.22	16.00	9055190011900
0.0472		1.20	38.00	14.20	16.00	9055190012000
0.0512		1.30	38.00	14.05	16.00	9055190013000
0.0520		1.32	38.00	14.02	16.00	9055190013200
0.0551		1.40	40.00	15.90	18.00	9055190014000
0.0591		1.50	40.00	15.75	18.00	9055190015000
0.0594		1.51	43.00	17.74	20.00	9055190015100
0.0626	1/16	1.59	43.00	17.62	20.00	9055190015900
0.0630		1.60	43.00	17.60	20.00	9055190016000
0.0634		1.61	43.00	17.59	20.00	9055190016100
0.0669		1.70	43.00	17.45	20.00	9055190017000
0.0701		1.78	46.00	19.33	22.00	9055190017800
0.0709		1.80	46.00	19.30	22.00	9055190018000
0.0728		1.85	46.00	19.23	22.00	9055190018500
0.0748		1.90	46.00	19.15	22.00	9055190019000
0.0760		1.93	49.00	21.11	24.00	9055190019300
0.0780	5/64	1.98	49.00	21.03	24.00	9055190019800
0.0783		1.99	49.00	21.02	24.00	9055190019900
0.0787		2.00	49.00	21.00	24.00	9055190020000
0.0811		2.06	49.00	20.91	24.00	9055190020600
0.0819		2.08	49.00	20.88	24.00	9055190020800
0.0827		2.10	49.00	20.85	24.00	9055190021000
0.0858		2.18	53.00	23.73	27.00	9055190021800
0.0866		2.20	53.00	23.70	27.00	9055190022000
0.0890		2.26	53.00	23.61	27.00	9055190022600
0.0906		2.30	53.00	23.55	27.00	9055190023000
0.0933		2.37	57.00	26.45	30.00	9055190023700
0.0937	3/32	2.38	57.00	26.43	30.00	9055190023800
0.0945		2.40	57.00	26.40	30.00	9055190024000
0.0961		2.44	57.00	26.34	30.00	9055190024400
0.0980		2.49	57.00	26.27	30.00	9055190024900
0.0984		2.50	57.00	26.25	30.00	9055190025000
0.0996		2.53	57.00	26.21	30.00	9055190025300
0.1016		2.58	57.00	26.13	30.00	9055190025800
0.1024		2.60	57.00	26.10	30.00	9055190026000

Diameter (d ₁)			l ₁ mm	t _{max} mm	l ₂ mm	EDP #
inch	wire/ltr	mm				
0.1039		2.64	57.00	26.04	30.00	9055190026400
0.1063		2.70	61.00	28.95	33.00	9055190027000
0.1067		2.71	61.00	28.94	33.00	9055190027100
0.1094	7/64	2.78	61.00	28.83	33.00	9055190027800
0.1098		2.79	61.00	28.82	33.00	9055190027900
0.1102		2.80	61.00	28.80	33.00	9055190028000
0.1110		2.82	61.00	28.77	33.00	9055190028200
0.1130		2.87	61.00	28.70	33.00	9055190028700
0.1142		2.90	61.00	28.65	33.00	9055190029000
0.1161		2.95	61.00	28.58	33.00	9055190029500
0.1181		3.00	61.00	28.50	33.00	9055190030000
0.1201		3.05	65.00	31.43	36.00	9055190030500
0.1220		3.10	65.00	31.35	36.00	9055190031000
0.1248	1/8	3.17	65.00	31.25	36.00	9055190031700
0.1260		3.20	65.00	31.20	36.00	9055190032000
0.1283		3.26	65.00	31.11	36.00	9055190032600
0.1299		3.30	65.00	31.05	36.00	9055190033000
0.1339		3.40	70.00	33.90	39.00	9055190034000
0.1358		3.45	70.00	33.83	39.00	9055190034500
0.1378		3.50	70.00	33.75	39.00	9055190035000
0.1406	9/64	3.57	70.00	33.65	39.00	9055190035700
0.1417		3.60	70.00	33.60	39.00	9055190036000
0.1441		3.66	70.00	33.51	39.00	9055190036600
0.1457		3.70	70.00	33.45	39.00	9055190037000
0.1469		3.73	70.00	33.41	39.00	9055190037300
0.1496		3.80	75.00	37.30	43.00	9055190038000
0.1520		3.86	75.00	37.21	43.00	9055190038600
0.1535		3.90	75.00	37.15	43.00	9055190039000
0.1539		3.91	75.00	37.14	43.00	9055190039100
0.1563	5/32	3.97	75.00	37.05	43.00	9055190039700
0.1571		3.99	75.00	37.02	43.00	9055190039900
0.1575		4.00	75.00	37.00	43.00	9055190040000
0.1591		4.04	75.00	36.94	43.00	9055190040400
0.1610		4.09	75.00	36.87	43.00	9055190040900
0.1614		4.10	75.00	36.85	43.00	9055190041000
0.1654		4.20	75.00	36.70	43.00	9055190042000
0.1661		4.22	75.00	36.67	43.00	9055190042200
0.1693		4.30	80.00	40.55	47.00	9055190043000
0.1720	11/64	4.37	80.00	40.45	47.00	9055190043700
0.1728		4.39	80.00	40.42	47.00	9055190043900
0.1732		4.40	80.00	40.40	47.00	9055190044000
0.1772		4.50	80.00	40.25	47.00	9055190045000

Diameter (d ₁)			l ₁ mm	t _{max} mm	l ₂ mm	EDP #
inch	wire/ltr	mm				
0.1799		4.57	80.00	40.15	47.00	9055190045700
0.1811		4.60	80.00	40.10	47.00	9055190046000
0.1819		4.62	80.00	40.07	47.00	9055190046200
0.1850	3/16	4.70	80.00	39.95	47.00	9055190047000
0.1874		4.76	86.00	44.86	52.00	9055190047600
0.1890		4.80	86.00	44.80	52.00	9055190048000
0.1909		4.85	86.00	44.73	52.00	9055190048500
0.1929		4.90	86.00	44.65	52.00	9055190049000
0.1937		4.92	86.00	44.62	52.00	9055190049200
0.1961		4.98	86.00	44.53	52.00	9055190049800
0.1969		5.00	86.00	44.50	52.00	9055190050000
0.1992		5.06	86.00	44.41	52.00	9055190050600
0.2008		5.10	86.00	44.35	52.00	9055190051000
0.2012		5.11	86.00	44.34	52.00	9055190051100
0.2031	13/64	5.16	86.00	44.26	52.00	9055190051600
0.2039		5.18	86.00	44.23	52.00	9055190051800
0.2047		5.20	86.00	44.20	52.00	9055190052000
0.2055		5.22	86.00	44.17	52.00	9055190052200
0.2087		5.30	86.00	44.05	52.00	9055190053000
0.2091		5.31	93.00	49.04	57.00	9055190053100
0.2126		5.40	93.00	48.90	57.00	9055190054000
0.2130		5.41	93.00	48.89	57.00	9055190054100
0.2165	7/32	5.50	93.00	48.75	57.00	9055190055000
0.2189		5.56	93.00	48.66	57.00	9055190055600
0.2205		5.60	93.00	48.60	57.00	9055190056000
0.2209		5.61	93.00	48.59	57.00	9055190056100
0.2244		5.70	93.00	48.45	57.00	9055190057000
0.2280		5.79	93.00	48.32	57.00	9055190057900
0.2283		5.80	93.00	48.30	57.00	9055190058000
0.2323		5.90	93.00	48.15	57.00	9055190059000
0.2339	15/64	5.94	93.00	48.09	57.00	9055190059400
0.2343		5.95	93.00	48.08	57.00	9055190059500
0.2362		6.00	93.00	48.00	57.00	9055190060000
0.2378	B	6.04	101.00	53.94	63.00	9055190060400
0.2402		6.10	101.00	53.85	63.00	9055190061000
0.2421		6.15	101.00	53.78	63.00	9055190061500
0.2441		6.20	101.00	53.70	63.00	9055190062000
0.2461	D	6.25	101.00	53.63	63.00	9055190062500
0.2480		6.30	101.00	53.55	63.00	9055190063000
0.2500		6.35	101.00	53.48	63.00	9055190063500
0.2520	1/4	6.40	101.00	53.40	63.00	9055190064000
0.2559		6.50	101.00	53.25	63.00	9055190065000
0.2571		6.53	101.00	53.21	63.00	9055190065300
0.2598		6.60	101.00	53.10	63.00	9055190066000
0.2610	G	6.63	101.00	53.06	63.00	9055190066300
0.2638		6.70	101.00	52.95	63.00	9055190067000
0.2657		6.75	109.00	58.88	69.00	9055190067500
0.2677	17/64	6.80	109.00	58.80	69.00	9055190068000
0.2717		6.90	109.00	58.65	69.00	9055190069000
0.2756		7.00	109.00	58.50	69.00	9055190070000
0.2768	J	7.03	109.00	58.46	69.00	9055190070300
0.2795		7.10	109.00	58.35	69.00	9055190071000
0.2811		7.14	109.00	58.29	69.00	9055190071400
0.2835	9/32	7.20	109.00	58.20	69.00	9055190072000
0.2874		7.30	109.00	58.05	69.00	9055190073000
0.2902		7.37	109.00	57.95	69.00	9055190073700
0.2913	L	7.40	109.00	57.90	69.00	9055190074000
0.2949		7.49	109.00	57.77	69.00	9055190074900
0.2953		7.50	109.00	57.75	69.00	9055190075000
0.2969	19/64	7.54	117.00	63.69	75.00	9055190075400
0.2992		7.60	117.00	63.60	75.00	9055190076000
0.3020		7.67	117.00	63.50	75.00	9055190076700

Diameter (d ₁)			l ₁ mm	t _{max} mm	l ₂ mm	EDP #
inch	wire/ltr	mm				
0.3031		7.70	117.00	63.45	75.00	9055190077000
0.3071		7.80	117.00	63.30	75.00	9055190078000
0.3110		7.90	117.00	63.15	75.00	9055190079000
0.3126	5/16	7.94	117.00	63.09	75.00	9055190079400
0.3150		8.00	117.00	63.00	75.00	9055190080000
0.3161		8.03	117.00	62.96	75.00	9055190080300
0.3189	O	8.10	117.00	62.85	75.00	9055190081000
0.3228		8.20	117.00	62.70	75.00	9055190082000
0.3268		8.30	117.00	62.55	75.00	9055190083000
0.3280	21/64	8.33	117.00	62.51	75.00	9055190083300
0.3307		8.40	117.00	62.40	75.00	9055190084000
0.3319		8.43	117.00	62.36	75.00	9055190084300
0.3346	Q	8.50	117.00	62.25	75.00	9055190085000
0.3386		8.60	125.00	68.10	81.00	9055190086000
0.3390		8.61	125.00	68.09	81.00	9055190086100
0.3425	R	8.70	125.00	67.95	81.00	9055190087000
0.3437		8.73	125.00	67.91	81.00	9055190087300
0.3465		8.80	125.00	67.80	81.00	9055190088000
0.3480	S	8.84	125.00	67.74	81.00	9055190088400
0.3504		8.90	125.00	67.65	81.00	9055190089000
0.3543		9.00	125.00	67.50	81.00	9055190090000
0.3579	T	9.09	125.00	67.37	81.00	9055190090900
0.3583		9.10	125.00	67.35	81.00	9055190091000
0.3594		9.13	125.00	67.31	81.00	9055190091300
0.3622	23/64	9.20	125.00	67.20	81.00	9055190092000
0.3661		9.30	125.00	67.05	81.00	9055190093000
0.3677		9.34	125.00	66.99	81.00	9055190093400
0.3701	U	9.40	125.00	66.90	81.00	9055190094000
0.3740		9.50	125.00	66.75	81.00	9055190095000
0.3748		9.52	133.00	72.72	87.00	9055190095200
0.3772	V	9.58	133.00	72.63	87.00	9055190095800
0.3780		9.60	133.00	72.60	87.00	9055190096000
0.3819		9.70	133.00	72.45	87.00	9055190097000
0.3858	W	9.80	133.00	72.30	87.00	9055190098000
0.3898		9.90	133.00	72.15	87.00	9055190099000
0.3906		9.92	133.00	72.12	87.00	9055190099200
0.3937	25/64	10.00	133.00	72.00	87.00	9055190100000
0.3969		10.08	133.00	71.88	87.00	9055190100800
0.3976		10.10	133.00	71.85	87.00	9055190101000
0.4016	Y	10.20	133.00	71.70	87.00	9055190102000
0.4039		10.26	133.00	71.61	87.00	9055190102600
0.4055		10.30	133.00	71.55	87.00	9055190103000
0.4063	13/32	10.32	133.00	71.52	87.00	9055190103200
0.4094		10.40	133.00	71.40	87.00	9055190104000
0.4130		10.49	133.00	71.27	87.00	9055190104900
0.4134	Z	10.50	133.00	71.25	87.00	9055190105000
0.4220		10.72	142.00	77.92	94.00	9055190107200
0.4331		11.00	142.00	77.50	94.00	9055190110000
0.4374	7/16	11.11	142.00	77.34	94.00	9055190111100
0.4528		11.50	142.00	76.75	94.00	9055190115000
0.4531		11.51	142.00	76.74	94.00	9055190115100
0.4689	15/32	11.91	151.00	83.14	101.00	9055190119100
0.4724		12.00	151.00	83.00	101.00	9055190120000
0.4843		12.30	151.00	82.55	101.00	9055190123000
0.4921	31/64	12.50	151.00	82.25	101.00	9055190125000
0.5000		12.70	151.00	81.95	101.00	9055190127000
0.5118		13.00	151.00	81.50	101.00	9055190130000
0.5157	33/64	13.10	151.00	81.35	101.00	9055190131000
0.5311		13.49	160.00	87.77	108.00	9055190134900
0.5315		13.50	160.00	87.75	108.00	9055190135000
0.5512	9/16	14.00	160.00	87.00	108.00	9055190140000
0.5626		14.29	169.00	92.57	114.00	9055190142900

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	260 210		0.0035 0.0025	0.0050 0.0040	0.0080 0.0065	0.0080 0.0065	0.0100 0.0080	0.0125 0.0100	0.0160 0.0125		
Free-cutting steels	≤ 25 ≤ 32	≤ 255 ≤ 301	295 245		0.0040 0.0035	0.0065 0.0050	0.0100 0.0080	0.0100 0.0080	0.0125 0.0100	0.0160 0.0125	0.0200 0.0160		
Unalloyed heat-treatable steels	≤ 20 ≤ 25 ≤ 32	≤ 220 ≤ 255 ≤ 301	160 210 195		0.0035 0.0035 0.0035	0.0050 0.0050 0.0050	0.0080 0.0080 0.0080	0.0080 0.0080 0.0080	0.0100 0.0100 0.0100	0.0125 0.0125 0.0125	0.0160 0.0160 0.0160		
Alloyed heat-treatable steels	≤ 32 ≤ 43	≤ 301 ≤ 402	195 160		0.0035 0.0025	0.0050 0.0040	0.0080 0.0065	0.0080 0.0065	0.0100 0.0080	0.0125 0.0100	0.0160 0.0125		
Unalloyed case hardened steels	≤ 25	≤ 255	260		0.0040	0.0065	0.0100	0.0100	0.0125	0.0160	0.0200		
Alloyed case hardened steels	≤ 32 ≤ 43	≤ 301 ≤ 402	195 160		0.0035 0.0025	0.0050 0.0040	0.0080 0.0065	0.0080 0.0065	0.0100 0.0080	0.0125 0.0100	0.0160 0.0125		
Nitriding steels	≤ 32 ≤ 43	≤ 301 ≤ 402	180 160		0.0025 0.0025	0.0040 0.0040	0.0065 0.0065	0.0065 0.0065	0.0080 0.0080	0.0100 0.0100	0.0125 0.0125		
Tool steels	≤ 25 ≤ 43	≤ 255 ≤ 402	145 110		0.0025 0.0025	0.0040 0.0040	0.0065 0.0065	0.0065 0.0065	0.0080 0.0080	0.0100 0.0100	0.0125 0.0125		
High speed steels	≤ 43	≤ 402	95		0.0020	0.0035	0.0050	0.0050	0.0065	0.0080	0.0100		
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	325 260		0.0040 0.0040	0.0065 0.0065	0.0100 0.0100	0.0100 0.0100	0.0125 0.0125	0.0160 0.0160	0.0200 0.0200		
Spheroidal graphite iron and malleable cast iron	≤ 23 ≤ 38	≤ 242 ≤ 354	260 225		0.0040 0.0040	0.0065 0.0065	0.0100 0.0100	0.0100 0.0100	0.0125 0.0125	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	590		0.0050	0.0080	0.0125	0.0125	0.0160	0.0200	0.0250		
Al wrought alloys	-	≤ 200	520		0.0050	0.0080	0.0125	0.0125	0.0160	0.0200	0.0250		
Al cast alloys ≤ 10 % Si	-	≤ 180	490		0.0050	0.0080	0.0125	0.0125	0.0160	0.0200	0.0250		
≤ 24 % Si	-	≤ 180	390		0.0040	0.0065	0.0100	0.0100	0.0125	0.0160	0.0200		
Magnesium alloys	-	≤ 120	590		0.0040	0.0065	0.0100	0.0100	0.0125	0.0160	0.0200		
Copper, low-alloyed	-	≤ 150											
Brass, short-chipping	-	≤ 180	590		0.0040	0.0065	0.0100	0.0100	0.0125	0.0160	0.0200		
long-chipping	-	≤ 180											
Bronze, short-chipping	-	≤ 180											
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	160 130	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	195 160	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	160 130 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	70 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				
Unalloyed case hardened steels	≤ 25	≤ 255	130	0.0017	0.0050	0.0080	0.0100	0.0125	0.0125				
Alloyed case hardened steels	≤ 32 ≤ 43	≤ 301 ≤ 402	65 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				
Nitriding 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				
Tool steels	≤ 25 ≤ 43	≤ 255 ≤ 402	70 40	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	40	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	65 45 55	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	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				
Spheroidal graphite iron and malleable cast iron	≤ 23 ≤ 38	≤ 242 ≤ 354	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				
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	225	0.0020	0.0065	0.0100	0.0125	0.0160	0.0160				
Al wrought alloys	-	≤ 200	225	0.0020	0.0065	0.0100	0.0125	0.0160	0.0160				
Al cast alloys ≤ 10 % Si	-	≤ 180	295	0.0020	0.0065	0.0100	0.0125	0.0160	0.0160				
≤ 24 % Si	-	≤ 180	260	0.0017	0.0050	0.0080	0.0100	0.0125	0.0125				
Magnesium alloys	-	≤ 120	260	0.0017	0.0050	0.0080	0.0100	0.0125	0.0125				
Copper, low-alloyed	-	≤ 150	100	0.0015	0.0040	0.0065	0.0080	0.0100	0.0100				
Brass, short-chipping	-	≤ 180	205	0.0015	0.0040	0.0065	0.0080	0.0100	0.0100				
long-chipping	-	≤ 180	130	0.0015	0.0040	0.0065	0.0080	0.0100	0.0100				
Bronze, short-chipping	-	≤ 180	160	0.0012	0.0030	0.0050	0.0065	0.0080	0.0080				
long-chipping	≤ 25 ≤ 32	≤ 255 ≤ 301	95 95	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			80	0.0012	0.0030	0.0050	0.0065	0.0080	0.0080				
Thermoplastics			80	0.0012	0.0030	0.0050	0.0065	0.0080	0.0080				
Reinforced plastics - Kevlar													
Reinforced plastics - GFK / CFK													