Metal	British Standard	Grade	Equivalent specifications	Tensile strength -N/ mm²	0.2% proof strength N/ mm²	Elongation %	Brinell hardness HB	Izod impact Nm	Specific gravity grms/ cc	Expansion coefficient per °C x10⁻⁶	Thermal conductivity cal/sec/cm2 /°C/cm	Electrical resistivity microhm -cm	Specific heat cal/grm/ °C	Young's modulus N/ mm²	Weldability	Machinability	Advantageous properties (see key below)
Carbon & low alloy steels	**BS3146/1**																
Carbon steel	CLA1	A	AISI C1020; BS3100 A1	430	195	15	121-174		7.86	12.3	0.12	19	0.116	202,000	Good	Heat treated	F
		B	AISI C1030; BS3100 A2	500	215	13	143-183		7.85	12.0	0.12	19	0.116	205,000	Heat treated	Good	F
		C	AISI C1040; BS3100 A3	540	245	11	163-207		7.84	11.7	0.11	19	0.115	202,000	Heat treated	Good	F
1.5%Mn steel (pearlitic manganese)	2		AISI C1027; BS3100 A4	550-700	310	13	152-201	41	7.84	13.2	0.11	23	0.115	202,000	Heat treated	Good	F,K
Alloy steel 1%Cr-Mo	3		AISI 9840; BS3100 BT1	700-850	495	11	201-255	34	7.84	13.0	0.10	22	0.113	202,000	Heat treated	Good	F,K
Alloy steel 3%Cr-Mo	3		AISI 9840; BS3100 BT1	700-850	495	11	201-255	34	7.84	12.5	0.08	27	0.115	202,000	Heat treated	Good	F,K
Alloy steel 3%Cr-Mo	4		AISI 4337; BS3100 BT2	850-1,000	585	11	284-302	20	7.85	12.5	0.08	27	0.115	202,000	Heat treated	Good	F,K
Alloy steel Ni-Cr-Mo	4		AISI 4337; BS3100 BT2	850-1,000	585	11	284-302	20	7.85	12.2	0.08	27	0.118	202,000	Heat treated	Good	F,K
High-tensile steel	5	A	BS970 826M31(2); Afnor 40 NDC10	1,000	880	9	302-341	41	7.86	12.0	0.08	30	0.124	202,000	Heat treated	Good	F,K
		B	BS970 826M31(2); Afnor 40 NDC10	1,160	1,000	5	341-388	14	7.86	12.0	0.08	30	0.124	202,000	Heat treated	Good	F,K
3%Cr-Mo steel	7		BS3100 B4; EN29	620-770	480	14	179-223	34	7.86	12.5	0.115	280	0.114	202,000	Heat treated	Good	F,G,H
Carbon surface-hardening steel	8		AISI C1040; BS3100 AW2	540	245	15	544		7.85	11.7	0.115	19	0.115	202,000	Heat treated	Good	C
Carbon case-hardening steel	9		AISI C1016; BS3100 AW1	495	215	15		27	7.87	12.0	0.14	15	0.114	202,000	Good	Heat treated	C,K
3%Ni case-hardening steel	10		EN33; Afnor12N12, 20 NCD, 12TSM	700	350	14		41	7.89	12.0	0.12	22		202,000	Good	Good	K
3%Cr-Mo nitriding steel	11		BS3100 B4; EN40;	850-1,000	600	8	248-302	20	7.85	12.2	0.084	30	0.115	202,000	Heat treated	Good	C,K
1%Cr abrasion-resisting steel	12	A	AISI 5147; BS3100 BW2	700		8	207		7.87	12.1	0.09	22	0.114	202,000	Heat treated	Heat treated	C
		B	AISI 4150; BS3100 BW3				293		7.87	12.1	0.09	22	0.114	202,000	Heat treated	Heat treated	B,D
		C	BS3100 BW4; Afnor 60 CD5				341		7.87	12.1	0.09	22	0.114	202,000	Heat treated	Heat treated	B,D
Ni-Mo steel	13		AISI 4617; EN34	700	350	14		41	7.87	12.0	0.09	23			Good	Good	K
Corrosion & heat resisting steels	**BS3146/2**																
13%Cr martensitic steels	ANC1	A	AISI 403; BS970 410S21	540	340	15	152-207		7.73	11.0	0.059	51	0.115	205,000	Poor	Heat treated	E,F,H
		B	AISI 420; BS970 420S29	620	415	13	183-229		7.73	11.0	0.059	51	0.115	216,000	Poor	Heat treated	E,F,H
		C	AISI 420; BS970 420S37	695	435	11	201-255		7.75	11.0	0.058	51	0.115	215,000	Poor	Heat treated	E,F,H
18%Cr 2%Ni martensitic steel	2		AISI 431; BS970 431S29	850-1,000	630	8	248-302		7.70	10.0	0.045	72	0.115	212,000	Poor	Tip tools	E,G,H
18%Cr 8%Ni austensitic steel	3	A	AISI 304; BS970 302S25	460	200	20			7.93	17.0	0.036	72	0.120	199,000	Argon arc	Tip tools	H,J
		B	AISI 347; BS970 347S17	460	200	20			7.93	17.0	0.038	72	0.120	199,000	Argon arc	Tip tools	G,H,J
18%Cr 10%Ni 3%Mo austensitic steel	4	A	AISI 317; BS970 317S16	500	210	12			7.96	16.0	0.039	73	0.120	199,000	Argon arc	Tip tools	G,H,J
		B	AISI 316; BS970 316S16	500	210	12			7.96	16.5	0.039	73	0.120	199,000	Argon arc	Tip tools	G,H,J
		C	AISI 318; BS970 320S17	500	210	12			7.96	16.0	0.039	73	0.120	199,000	Argon arc	Tip tools	G,H,J
Nickel-chromium steel	5	A	AISI 310, BS970 310S24						7.90	16.5	0.038	90	0.130	199,000	Good	Tip tools	G,H
		B	AISI 330; UK/USA 331C60						8.02	16.0	0.032	105	0.110	199,000	Good	Tip tools	G,H
		C	UK/USA 334C11; Afnor NC15Fe						8.12	14.2	0.032	108	0.110	199,000	Good	Tip tools	G,H
Chromium-nickel steel	6	A	AISI 309; UK/USA 309C30	460		17			7.90	16.5	0.033	85	0.130	193,000	Good	Tip tools	G
		B	EN55; UK/USA 309C30	460		17			7.93	15.0	0.030	87	0.120	193,000	Good	Tip tools	G
		C	Afnor Z15CNWS2213	460		17			7.93	15.0	0.030	87	0.120	193,000	Good	Tip tools	G
Nickel 20%Cr 0.4%Ti	8		UK/USA Nimocast 75; Afnor NC20T	510-540	185-200		39-43		8.37	12.2	0.033	107	0.110	185,000	Argon arc	Tip tools	G
Nickel 20%Cr 2.5%Ti 12%Al	9		UK/USA Nimocast 80; Afnor NC20TA	525-725	480-525		6-15		8.17	11.9	0.028	120	0.103	186,000	None	Fair	G
Nickel 20%Cr 16.5%Co 24%Ti 1.3%Al	10		UK/USA Nimocast 90; Afnor NC20K17TA	630-690	510	14			8.18	11.6	0.030	115	0.110	193,000	None	Fair	G
Nickel 21%Cr 10%Co 10%Mo	11		UK/USA C242; Afnor NC21DK10	420	297	5			8.40	12.5	0.043		0.103		None	Fair	G
Cobalt 26%Cr 10%Ni 7%W	13		UK/USA X40; Afnor KC25NW	649	417	5	369		8.61	10.5	0.035	97	0.100	178,000	Inert gas	Tip tools	E,G
Cobalt 27%Cr 5.5%Mo 2.7%Ni	14		UK/USA Stellite 31; Afnor KC25NW	650	450	6	369		8.30	11.0	0.035	87		178,000	Inert gas	Tip tools	C,G,K
Nickel 28%Mo	15		UK/USA Hastelloy B; Afnor ND28FeKV	585	415	14	192		9.24	10.0	0.027	135	0.091	193,000	Good	Good	C,G,H,K
Nickel 17%Mo 16.5%Cr 45%W	16		UK/USA Hastelloy C; Afnor NCD16Fe	615	365	11	207		8.94	11.3	0.030	133	0.092	193,000	Good	Good	G,H,J
Nickel 9%Si 3%Cu	17		UK/USA Hastelloy D;						7.80	11.0	0.050	113	0.110	193,000	Good	Good	G,H
Nickel 31%Cu	18	A	UK/USA Monel; Afnor NU30Fe	432-510	170	16	100-150		8.83	13.6	0.062	48	0.13	165,000	Resistance	Good	G,H,I,J
		B	UK/USA Monel H	541-664	280	10	180-230		8.83	13.6	0.062	48	0.13	165,000	Resistance	Good	G,H,I,J
		C	UK/USA Monel H	680-695	250				8.83	13.6	0.062	48	0.13	165,000	Resistance	Good	G,H,I,J
Nickel 20%Cr 7%Nb 6%Mo 3%Fe	19		UK/USA PE10 MC102; Afnor NC20NbDW	680	607	5	260-340		8.84	12.8	0.27	120	0.085	190,000	Fair	Fair	G
14%Cr 5%Ni 2%Cu 1%Mo	20	A	UK/USA FV520	920-1200	800	12		20	7.83	11.5	0.040	85	0.12	201,000	Good	Good	H,I
steel (precipitation hardening)		B	UK/USA FV520	1,250-1,500	950	15		11	7.83	11.5	0.040	85	0.12	201,000	Good	Good	H,I
16%Cr 5%Ni 3%Cu 2%Mo steel	21			700	500	18-20		14-27	7.70	11.7	0.036	80		193,000	Tig	Good	H,I
16%Cr 4%Ni 3%Cu steel	22	A	UK/USA 17-4PH; Afnor NbTa	1,230	1,030	8	361		7.75	10.8	0.040	80	0.12	201,000	Fair	Good	H,I
(precipitation hardening)		B	AISI 324; Afnor	1,030	895	8	313		7.75	10.8	0.040	80	0.12	201,000	Fair	Good	H,I
		C		900	830	8	294		7.75	10.8	0.040	80	0.12	201,000	Fair	Good	H,I

NATURE OF THE GUIDE

Information given here is intended only as an aid in selecting metals for specific purposes. Before confirming the choice, reference should be made to more detailedinformation in the standard specifications and other relevant literature. Heat treatment, surface finishing etc., should also be considered.

ACCREDITATION AND MEMBERSHIPS

Member of Cast Metals Federation
Member of Castings Technology International

CONVERSION FACTORS

1 metre (m)	3.281 feet1	N/sq.mm	145.0 lb/sq. inch
1 millimetre (mm)	0.03937 inch	1 gram (grm)	0.002205 lb
1 square mm	0.00153 sq. inch	1 grm/cc	0.03641 lb/cu. inch
1 cubic centimetre (cc)	0.06102 cu. inch	1 calorie (cal)	0.2520 BThU
1 Newton (N)	0.2248 pounds force	1 cal	4.187 joules
1 Nm	0.7376 foot-lb	1 degree C (°C)	0.5556 °F

KEY TO ADVANTAGEOUS PROPERTIES

A High strength-to-weight ratio
B Spring
C Bearing, lubricated
D Bearing, dry
E Pressure tightness
F Cold working
G Use at elevated temperatures
H Anti-atmospheric corrosion
I Marine conditions
J Acid resisting
K Shock resistant

Polycast Limited Telephone: +44 (0) 1489 885560 Email: sales@polycastltd.uk