



# HYOZMA PRECISION CASTINGS LTD

Manufacturer of precision investment castings

Central Venue #456-1, Diankou Industrial Park,

Zhuji, Zhejiang, China

Telephone:86-575-87632909

E-mail: admin@hyozma.com

Website: www.hyozma.com

## CARBON & LOW ALLOY STEELS

INVESTMENT CASTING SPECIFICATION BS3146 PART 1	TYPE	CHEMICAL COMPOSITION %								U.T.S N/mm2 Min Max	P.S N/mm2 Min	Elong %	IZOD ft.lbs	Hardness Min Max	NEAREST EQUIVALENT SPECIFICATIONS					CHARACTERISTICS & TYPICAL APPLICATIONS
		C Min Max	Si Min Max	Mn Min Max	Ni Min Max	Cr Min Max	Mo Min Max	OTHERS	BS 970 En(1972)						BS970 HC100	A.I.S.I	Afnor	Wer kstoft		
CLA 1A CLA 1B CLA 1C	Mild Steel	0.15 0.25 0.25 0.35 0.35 0.45	0.2 0.6 0.2 0.6 0.2 0.6	0.4 1.0 0.4 1.0 0.4 1.0	—0.4* —0.4* —0.4*	—0.3* —0.3* —0.3*	—0.1* —0.1* —0.1*	Cu0.3max* Cu0.3max* Cu0.3max*	430-- 500-- 540--	195+ 215+ 245+	15 13 11	— — —	121 174 143 183 163 207	3 070M20 3 080M30 8 080M40	HC1	C1020/1 /2/3 C1030 C1040	C20d C30d C40d	1.0443 1.0551 1.0553	Plain Carbon Steels with a range of tensile properties (via heat treatment)with good ductility for low and medium strength applications e.g. brackets, housings, links.	
CLA 2	<sup>1/2</sup> % Manganese	0.18 0.25	0.2 0.5	1.2 1.7	—0.4*	—0.3*	—0.1*	Cu0.3max*	550 700	310+	13	30	152 201	14A 150M19	HC2	C1027	20MNC6	1.506	Superior properties to plain carbon steel. Medium strength applications.where degree of shock resistance required e.g. links, levers.	
CLA 3	45_55ton	0.35 0.45	0.2 0.6	0.5 0.8	—0.4	0.9 1.5	0.2 0.4	BS3146 only soecifies the mechanical properties,plus S & P contents.Analys is shown is for reference only.	700 850	495	11	25	201 255	19 709M40	HC3	4140	40NCD6	1.6582	A range of tensile strengths possible with good ductility and shock resistance. Readily machineable. Medium and high strength applications where ductility shock and fatigue strength required e.g. brackets, levers, airframe parts, hydraulic machinery.	
CLA 4	55_65ton	0.35 0.45	0.2 0.6	0.5 0.8	1.3 1.8	0.9 1.5	0.2 0.4		850 1000	585	11	15	248 302	24 817M40	HC7 HC9	4337	32NCD10	1.658		
CLA 5A 5B	65_75ton Steel	0.22 0.32 0.22 0.32	0.3 0.7 0.3 0.7	0.3 0.8 0.3 0.8	—0.4 —0.4	2.5 3.5 2.5 3.5	0.4 0.7 0.4 0.7		1000— 1160—	880 1000	9 5	30 10	269 321 341 388	40B 722M28 40B 722M28	HC8 HC10	— —	40NCD10	—		

CLA7	3% Cr Mo Steel	0.15 0.25	0.3 0.8	0.3 0.6	—0.4**	2.5 3.5	0.35 0.6	Cu0.3max*	620 770	480	14	25	179 223	29 722M24	HC4	—	20CD12	1.7273	Medium strength, good ductility and resistance to thermal shock. Useful Steel corrosion and creep resistance for parts operating up to 400°C
CLA8	Carb.Steel Surf.Harden	0.37 0.45	0.2 0.6	0.5 0.8	—0.4*	—0.3*	—0.1*	Cu0.3max*	540—	245+	15	—	—	8 080M40	—	C1040	C40d	1.1191	Local or surface hardening to minimum 500HV but retaining good core Surf. Harden strength. Pawls, ratchets, triggers.
CLA9	Carb.Steel Case Harden	0.1 0.18	0.2 0.6	0.6 1.0	—0.4*	—0.3*	—0.1*	Cu0.3max*	495—	215+	15	20	—	32080M40	—	C1016	C14d	1.1141	Low Carbon case hardening for carburising or cyanide treatment. Low Case Harden tensile core gives good shock resistance. Ratchets, operating levers.
CLA10	3% Ni Case Harden	0.1 0.18	0.2 0.6	0.3 0.6	2.75 3.5	—0.3*	—0.1*	Cu0.3max*	700—	350+	14	30	—	33_	HC5	—	12N12	1.5637	Carburising or cyanide hardening with tough core and reasonable shock resistance. Reciprocating or intermittent loading - high speed connecting links and levers.
CLA11	3% Cr Mo Nitriding	0.2 0.30	0.3 0.8	0.3 0.6	—0.4**	2.9 3.5	0.4 0.7	V0.02max** Cu0.3max* Sn0.03max**	850 1000	600	8	15	248 302	40B 722M24	HC6	—	20CD12	1.7365	Nitride hardening to 900HV retaining high strength core, good ductility and shock resistance. Moving parts with wear resistance - crank pins and shafts, sewing machine loopers.
CLA12A 12B 12C	1% Cr Abrasion Resisting	0.45 0.55 0.45 0.55 0.45 0.55	0.3 0.8 0.3 0.8 0.3 0.8	0.5 1.0 0.5 1.0 0.5 1.0	—0.4* —0.4* —0.4*	0.8 1.2 0.8 1.2 0.8 1.2	—0.1* —0.1* 0.2 0.4	Cu0.3max* Cu0.3max* Cu0.3max*	700— 700— 700—	— — —	8 8 8	— — —	207— 293— 341—	— — —	— — —	5147 5147	50C5 60CD5	1.7228	Steels with capability of good through hardness and wear resistance. Grades B and C suitable for heavy duty conditions.
CLA 13	Ni Mo Case Harden	0.12 0.20	0.2 0.6	0.3 0.7	1.5 2.0	—0.3**	0.2 0.3	Cu0.3max*	700—	350+	14	30	—	34 665H17	—	4617	18ND7	1.7229	Case carburising, medium strength core and reasonable shock resistance Case Harden Alternative to CLA 10.