STEEL CASTINGS - TECHNICAL DATA

CORROSION & HEAT RESISTING STAINLESS STEELS & TOOL STEELS

Monmet helps our customers solve their problems with an unmatched expertise in alloy and process selection.

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ALLOY	ASTM SPECIFICATION	CHEMICAL COMPOSITION (Maximum unless range specified) C %	Si %	Mn %	Ni %	Cr %	Mo %	Other %	MINIMUM MECHANICAL PROPERTIES TENSILE STRENGTH (KSI)	YIELD STRENGTH (KSI)	ELONGATION %	REDUCTION OF AREA %	EQUIVALENT FOREIGN SPECS BRITISH STANDARD	GERMAN STANDARD	USA WROUGHT AISI STD	CHARACTERISTICS & APPLICATIONS
MARTENSITIC & PRECIPITATION HARDENING STAINLESS STEEL	A743: CA-15	0.15	1.50	1.00	1.00	11.5-14.0	0.50		90	65	18	30	410C21	1.4008 G-X8CRNI13	410	Good resistance to organic chemicals & gases. Used for impeller rings & sleeves in acid mine environments & especially the petroleum industry.
	AISI: Type 415 CA-15F	0.15	1.50	1.25	0.50	11.5-14.0	0.50	S 0.15-0.35	90	65	8	15				This is hardenable chromium stainless steel to which Sulfur has been added to improve the machinability. It is easily hardened by air or oil quenching followed by tempering to produce a wide range of mechanical properties.
	A743: CA-40	0.20-0.40	1.50	1.00	1.00	11.5-14.0	0.50		100	70	15	25	420C29	1.4027	420	Widely used in erosion, cavitation & wear application in mildly corrosive conditions. Application includes impeller sleeves, valve trim seats in boiler feed & acid mine waters.
	A743: CB-30	0.30	1.50	1.00	2.00	18.0-21.0			65	30						Fully ferritic stainless steel which does not respond to heat treatment. C8-30 is resistant to many acids, alkaline solutions and organic chemicals. Typical applications: furnace brackets and hangers, pump and valve parts.
	A743:CA-6NM	0.06	1.00	1.00	3.5-4.5	11.5-14.0	0.4-1.0		110	80	15	35	425C11	1.4313 G-X5CRNI134		These alloys exhibit high strength and hardness, superior corrosion & cavitation resistance (>CA-15). Applications include high pressure impellers, turbine runners & rotors.
	A747:CB7CU-1	0.07	1.00	0.70	3.6-4.6	15.5-17.70		Cu 2.5-3.2 Cb 0.15-0.35	125-175	97-145	5 10					These castings may be used in services requiring corrosion resistance and high strength at temperatures up to 599 F. They may be machined in solution-annealed condition and subsequently precipitation hardened to desired high-strength mechanical properties with little danger of cracking and distortion.
	A747:CB7CU-2	0.07	1.00	0.70	4.5-5.5	14.0-15.50		Cu 2.5-3.2 Cb 0.15-0.35	125-175	97-145	5 10					
	AMS 5352: 440 C	0.95-1.29	1.00	1.00	0.75	16.0-18.0	0.35-0.75									Used in hardened condition where a combination of high wear and corrosion resistance is required. Hardness and wear resistance increase with increasing Carbon content while their shock resistance and ductility decrease. Sulphur addition (0-07-0.20% S) improves machinability.
FERRITIC AUSTENITIC DUPLEX STAINLESS STEEL	A890:1A CD4MCu	0.04	1.00	1.00	4.75-6.0	24.5-26.5	1.75-2.25	Cu 2.75-3.25	100	70	16					Duplex Stainless Steels offer a combination of enhanced mechanical properties and excellent corrosion resistance when properly balanced in composition and properly heat treated. These alloys will develop a range of approximately 30 to 60% ferrite with the balance austenite. These steels also exhibit excellent cavitation resistance, wear resistance properties, & stress corrosion cracking properties in chloride containing environments such as saline & sea water.
	A890:1B CD4MCUN	0.04	1.00	1.00	4.7-6.0	24.5-26.5	1.7-2.3	Cu 2.7-3.3 B 0.10-0.25	125	97	10					
	A890:2A CE8MN	0.08	1.50	1.00	8.0-11.0	22.5-25.5	3.0-4.5	N 0.10-0.30	95	65	25					
	A890:3A CD6MN	0.06	1.00	1.00	4.0-6.0	24.0-27.0	1.75-2.5	N 0.15-0.25	95	65	25					
	A890:4A CD3MN	0.03	1.00	1.50	4.5-6.5	21.0-23.5	2.5-3.5	Cu 1.00 N 0.10-0.30	90	60	25					
	A890:5A CE3MN	0.03	1.00	1.50	6.0-8.0	24.0-26.0	4.0-5.0	N 0.10-0.30	100	75	18					
	A890:6A CD3MWCuN	0.03	1.00	1.00	6.5-8.5	24.0-26.0	3.0-4.0	Cu 0.5-1.0 W 0.5-1.0 N 0.2-0.3	100	65	25			G-X2CRNIMOCU WN 4508		
AUSTENITIC NON - HARDENABLE STAINLESS STEEL	A743:CF-3	0.03	2.00	1.50	8.0-12.0	17.0-21.0			70	30	35		304C12		304L	These steels have good resistance to strong oxidizing acids, salts & organic acids. These alloys are utilized extensively in valve bodies, paper mills, filter screens & propellers.
	A743:CF-8	0.08	2.00	1.50	8.0-11.0	18.0-21.0			70	30	35		304C15	1.4308 G-X6CRNI189	304	
	A743:CF-8C	0.08	2.00	1.50	9.0-12.00	18.0-21.0		Cb8XC	70	30	30		247C17	G-X7CRNINB189	347	This is classified as a stabilized steel with superior resistance to intergranular corrosion in welded products, in fact greater than CF8.
	A743:CF-3M	0.03	1.50	1.50	9.0-13.0	17.0-21.0	2.0-3.0		70	30	30		316C12		316L	The steel is used in textile paper, dairy, brewery & chemical plants for valves, pumps, casings & the handling of hot organic acids, fatty acids, sulfite & mild concentration of inorganic acids. The low carbon graded permit welding without the post-weld heat treatments and protect against intergranular corrosion.
	A743:CF-8M	0.08	2.00	1.50	9.0-12.00	18.0-21.0	2.0-3.0		70	30	30		316C16	1.4408 G-X6CRNIMO1810	316	
	A743:CG-3M	0.03	1.50	1.50	9.0-13.0	18.0-21.0	3.0-4.0		75	35	25				317L	The higher molybdenum content extends the range of use in reducing acids or mixed acids (pitting). Applications are similar to CG3M.
	A743:CG-8M	0.08	1.50	1.50	9.0-13.0	18.0-21.0	3.0-4.0		75	35	25		316C16	1.4448	317	
HIGH ALLOY STAINLESS STEELS	A743:CK-3MCUN	0.03	1.00	1.20	17.5-19.5	19.5-20.5	6.0-7.0	Cu 0.5-1.0 N 0.18-0.24	80	38	35					The high nickel and molybdenum content in these austenitic grades provides superior corrosion resistance to oxidizing acids. These steels are non-magnetic. Properties exhibited are better than the standard CF8M. Applications include pump casings, impellers, valves & mixer components.
	A743:CN-7M	0.07	1.50	1.50	27.5-30.5	19.0-22.0	2.0-3.0	Cu 3.0-4.0	62	25	35		332C11	1.4500 G-X7NICRMOCUNB		
	A743:CN-3M	0.03	1.00	2.00	23.0-27.0	20.0-22.0	4.5-5.5		63	25	30					
	A743:CN-3MN	0.03	1.00	2.00	23.5-25.5	20.0-22.0	6.0-7.0	Cu 7.0-3.25 N 0.18-0.26	80	28	35					

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TOOL STEEL	A597: CA-2	0.95-1.05	1.50	0.75		4.75-5.50	0.90-1.40	V 0.20-0.50				58-62 RC				This alloy is an air hardening alloy, intermediate in abrasion resistance between the oil hardening and high carbon types. It possesses good toughness characterisitics along with excellent non-deforming properties.
	A597: CD-2	1.40-1.60	1.50	1.00		11.0-13.0	0.70-1.20	V 0.40-1.0 Co 0.70-1.0				58-64 RC				These steels are highly wear resistant with deep-hardening promoted by high carbon and chromium contents. A careful balance of alloying elements and air-hardening properties results in extremely low dimensional change in hardenability.
	A597: CD-5	1.35-1.60	1.50	0.75		11.0-13.0	0.70-1.20	V 0.35-0.55 Co 2.5-3.5				58-64 RC				Medium resistance to heat softening limits the use of this group to applications <900 F. Typical uses are long-run blanking and forming dies, brick moulds, gages & abrasion-resistant liners.
	A597: CM-2	0.78-0.88	1.00	0.75	0.25	3.75-4.50	4.50-5.50	V 1.25-2.20 Co 0.25 W 5.50-6.75				64-66 RC				This alloy is similar in properties to tungsten high speed tool steel but it has slightly greater toughness at the same hardness. The main advantage of this alloy over the tungsten group lies in its lower cost, while maintaining equivalent performance. Typical use is for cutting tools of all types.
	A597: CS-5	0.50-0.65	1.75-2.25	0.60-1.0	0.40-0.60	0.35	0.20-0.80	V 3.50				53-58 RC				Shock resisting steels with carbon content maintained at about 0.5% have high strength with moderate wear resistance. Principal use is for chisels, rivet seats, hammers and other tools where repetitive high-impact loading is developed.
	A597: CS-7	0.45-0.55	0.60-1.0	0.40-0.80		3.0-3.50	1.20-1.60									
	A597: CH-12	0.30-0.40	1.50	0.75		4.75-5.75	1.25-1.75	V 0.20-0.50 W1.0-1.70				40-55 RC				These alloys are extremely deep hardening and may be air hardened in heavy sections. This property, with balanced alloy content, is responsible for low distortion in hardening. Applications include forging dies, die castings dies, mandrels.
	A597: CH-13	0.30-0.42	1.50	0.75		4.75-5.75	1.25-1.75	V 0.75-1.20				40-55 RC				
	A597: CO-1	0.85-1.00	1.50	1.0-3.0		0.40-1.0		V 0.30 W 0.40-0.60				58-62 RC				Oil hardening cold work steels are relatively inexpensive and their high carbon content produces adequate wear resistance for short term applications at or near room temperature. Applications: short-run forming dies.
HEAT RESISTING STAINLESS STEEL	A297: HC	0.50	2.00	1.50	4.00	26.0-30.0	0.50		55			180-250	452C11	1.4085 G-X70CR29	446	Excellent resistance to oxidation & high sulfurous flue gas (2100 F) but exhibits low creep strength. Applications include cemented ring segments, sinter bars & blower tubes. Similar to above, except exhibits greater creep & ductility. Applications include support skids, recuperators & nose ring segments.
	A297: HD	0.50	2.00	1.50	4.0-7.0	26.0-30.0	0.50		75	35	8	170-210		1.4823 G-X40CRNISI274	327	
	A297: HE	0.20-0.50	2.00	2.00	8.0-11.0	26.0-30.0	0.50		85	40	9	180-220	309C40		312	The high chromium content makes this alloy suitable for use in sulfurous atmospheres up to 2100 F. Applications include burner nozzles, recuperators & deflectors.
	A297: HF	0.20-0.40	2.00	2.00	8.0-12.0	18.0-23.0	0.50		70	35	25	150-190	302C35	1.4825 G-X25CRNISI189	308	Good resistance to oxidation up to 1600 F. Good creep strength up to 1500 F. Applications include sinter decks, billet skids & conveyor belt links.
	A297: HH A447: TYPE II	0.20-0.50	2.00	2.00	11.0-14.0	24.0-28.0	0.50		75	35	10	170-210	309C35 309C30	1.4837 G-X40CRNISI2512	309	Good corrosion resistance & creep strength in hot gas applications up to 1900F. Applications include cooler grates, sinter/pelletising grate bars, rabble arms, burner nozzles & supports.
	A297: HI	0.20-0.50	2.00	2.00	14.0-18.0	26.0-30.0	0.50		70	35	10	170-210				Good oxidation resistance to 2150 F. Primarily used for billet skids, furnace rails, lead pots & retorts for Mg production.
	A297: HK	0.20-0.60	2.00	2.00	18.0-22.0	24.0-28.0	0.50		65	35	10	170-220	310C45 310C40	1.4848 G-X40CRNISI2512	310	Good corrosion resistance & excellent creep strength to sulfurous, oxidizing & reducing gases up to 2000 F. Applications include rolls, cement cooler grates, burner nozzles & U-bends.
	A297: HL	0.20-0.60	2.00	2.00	18.0-22.0	28.0-32.0	0.50		65	35	10	180-220				Excellent corrosion resistance to oxidizing & reducing gases up to 2050 F. Applications include radiant tubes, furnace skids, stack dampers, enamelling furnace carriers & fixtures.
	A297: HN	0.20-0.50	2.00	2.00	23.0-27.0	19.0-23.0	0.50		63		8	150-190	311C11			Exhibits high creep strength & ductility up to 2000 F. Applications include brazing fixtures, furnace beams, chains & piercaps.
	A297: HT	0.35-0.75	2.50	2.00	33.0-37.0	15.0-19.0	0.50		65		4	170-200	330C12		330	High nickel content and low thermal expansion make this alloy suitable for high thermal shock & fatigue. This alloy also exhibits good resistance to carburization & nitriding (heat treat fixtures).
	A297: HP	0.35-0.75	2.50	2.00	33.0-37.0	24.0-28.0	0.50		62.5	34	4	180-220				The high nickel & chromium provides high resistance to oxidation, combustion & high creep stress to 2150 F. Applications include tube supports, heat treat trays & fixtures.
	A297: HU	0.35-0.75	2.50	2.00	37.0-41.0	17.0-21.0	0.50		65		4	180-220				High resistance to hot gas corrosion even in presence of some sulphur. Used in severe service applications where corrosion must be minimized up to 2100 F. These alloys withstand temperature cycling without cracking or severe warping. Typical applications in which these alloys five excellent service inslude nitriding, caburizing and hardening fixtures, heat-treating boxes, retorts and burner parts.
	A297: HW	0.35-0.75	2.50	2.00	58.0-62.0	10.0-14.0	0.50		65			180-220				
	A297: HX	0.35-0.75	2.50	2.00	64.0-68.0	15.0-19.0	0.50		60			180-220				

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