Physical Specification Of Commonly Cast Corrosion Resistant Alloys

Closest Equivalent Alloys	UNS	Closest DIN 17445	ASTM - A351/A743/ A890	Micro-Structure	Heat Treatment	T.S. Kg/mm2 min	Y.S. Kg/mm2 min.	Elong-action min.%	Applications
AISI 410	J91150	1.4008	CA15	Martensite	Hardened & Tempered	63.24	45.90	18	Valves and valve trim, pump parts for power plant and refining equipments, sliding or wearing parts like wedges for paper mills.
CA40	J91153	-	CA40	Martensite	Hardened & Tempered	-	-	-	Valves and valve trim, pump parts for power plant and refining equipments, sliding or wearing parts like wedges for paper mills. Has greater hardness then CA15
AISI 420	S42000	1.4021	-	Martensite	Hardened & Tempered	66.00	46.00	14	Used in wear resistance applications such as ROT (run over table) rolls in steel

									plants.
AISI 416	S41600	1.4005	CA15F	Martensite	Hardened & Tempered	77.00	59.00	18	Similler to CA15 with better machinability.
CA40F	J91154	-	CA40F	Martensite	Hardened & Tempered	70.00	49.50	12	Similler to CA40 with better machinability.
AISI 440A	S44004	-	-	Martensite	Annealed	-	-	-	Cutlery, valve parts, surgical instruments.
AISI 440C	S44003	1.4125	-	Martensite	Annealed	-	-	-	Used in applications requiring higher hardness and basic corrosion resistance.
1.4122	-	1.4122	-	-	-	-	-	-	-
F6NM	J91540	1.4313	CA6NM	Martensite	Hardened & Tempered	77.00	56.00	15	Parts of turbines, compressors, pumps and valves for chemical, pollution control, marine and power industries. Exhibits good cavitation resistance.
-	-	-	Class A Class B ASTM A487 Gr CA6NM	Martensite	Hardened & Tempered	77.01 70.38	56.10 52.53	15 17	Valve cages, sleeves and parts where higher corrosion resistance is required. Usually applied in 285 BHN max but can also be applied under 255 BHN max as per NACE standard for applications requiring higher toughness.
AISI 436	S43600	1.4526	-	-	-	-	-	-	-

CB30	J91803	-	CB30	Ferrite	Air Cooled	45.90	20.91	-	Non-hardenable grade with excellent resistance to nitric acid, alkaline solutions and many organic chemicals.
1.4418	-	1.4418	-	-	-	-	-	-	-
28/4	J92615	-	CC50	Ferrite	Annealed	-	-	-	Used in chemical, mining, pulp and paper machinery
BUME 5	-	1.4138	-	-	-	-	-	-	-
1.4746	-	1.4746	-	-	-	-	-	-	-
15.5 PH	J92110	1.4594	ASTM A747 Gr CB7Cu-2	Martensite	Solution Annealed & Precipitation Hardened	105.80	81.10	15	Wearing parts requiring corrosion resistance and high strength such as valves and in food processing, marine environment, petrochemical, pulp and paper industries at temperature upto 315^{o}C.
17.4 PH	J92180	1.4542	ASTM A747 Gr CB7Cu-1	Martensite	Solution Annealed & Precipitation Hardened	105.80	81.10	15	Wearing parts requiring corrosion resistance and high strength such as valves and in food processing, marine environment, petrochemical, pulp and paper industries at temperature upto 315 C.
CD4MCu	J93370	-	CD4MCu	Duplex	Solution Annealed	70.00	49.50	16	Used in chemical processing, marine environment, water supply, petroleum refining, pulp & paper, soap manufacturing

									and textile industries.
CD4MCuN	J93372	-	1B CD4MCuN	-	Solution Annealed	70.00	49.50	16	Used in chemical processing, marine environment, water supply, petroleum refining, pulp & paper, soap manufacturing and textile industries.
AISI 329	S32900	-	-	Duplex	Solution Annealed	73.00	56.00	25	Heat exchangers in pulp mills, nitic acid plants and phosphoric acid plants.
Lean Duplex	S32304	1.4362	-	-	Solution Annealed	-	-	-	-
Lean Duplex	-	1.4655	-	-	Solution Annealed	-	-	-	-
Duplex	S32550 J93373	1.4507	1C CD3MCuN	Duplex	Solution Annealed	70.38	46.00	25	Valve cages, sleeves and parts where enhanced corrosion resistance & strength is required.
Duplex	J93345	-	2A CE8MN	Ferrite + Austenite	Solution Annealed	66.81	45.90	25	Valve cages, sleeves and parts where enhanced corrosion resistance & strength is required.
Duplex	J93371	-	3A CD6MN	Ferrite + Austenite	Solution Annealed	66.81	45.90	25	Valve cages, sleeves and parts where enhanced corrosion resistance & strength is required.
2205	J92205 S31803 S32205	1.4462	4A CD3MN	Ferrite + Austenite	Solution Annealed	63.24	42.33	25	Valve cages, sleeves and parts where enhanced corrosion resistance &

									strength is required.
Super Duplex	J93404	-	5A CE3MN	Ferrite + Austenite	Solution Annealed	70.38	52.53	18	Valve cages, sleeves and parts where enhanced corrosion resistance & strength is required.
Super Duplex	J93380	-	6A CD3MWCuN	Ferrite + Austenite	Solution Annealed	70.38	45.90	25	Valve cages, sleeves and parts where enhanced corrosion resistance & strength is required.
AISI 304	J92600	1.4308	CF8	Austenite	Solution Annealed	49.47	21.09	35	General service, pumps, valves, etc. for chemical processing, oil refineries, textile dyeing, food machinery, fuel jets, fuel valves engine supports, etc.
AISI 347	J92710	1.4552	CF8C	Austenite	Solution Annealed	49.48	20.91	30	Used where heat treatment is not possible after welding.
AISI 304L	J92500	1.4311	CF3	Austenite	Solution Annealed	49.47	21.09	35	General service, pumps, valves, etc. for chemical processing, oil refining, textile dyeing, food machinery, fuel jets, fuel valves engine supports, etc.
AISI 304LN	-	1.4311	-	Austenite	Solution Annealed	49.47	21.09	35	Parts for the construction of apparatus and vessels for refrigerators.
AISI 305	-	1.4303	-	Austenite	Solution Annealed	49.47	21.09	35	Parts for free spinning deep drawing, severe cold heading operations.

AISI 316	J92900	1.4408	CF8M	Austenite	Solution Annealed	49.47	21.09	30	Pumps, valves, fittings, etc. in reducing acids, paper mill equipments, chemical process industries, sea water service, etc.
AISI 316L	J92800	1.4404	CF3M	Austenite	Solution Annealed	49.47	21.09	30	Pumps, valves, fittings, etc. in reducing acids, paper mill equipments, chemical process industries, sea water service, etc.
AISI 316Ti	S31635	1.4571	-	Austenite	Solution Annealed	49.47	21.09	30	Pumps, valves, fittings, etc. in reducing acids, paper mill equipments, chemical process industries, sea water service, etc. Exhibits prolonged endurance at elevated temprature compared to 316
AISI 316LN	J92804	1.4406	CF3MN	-	-	-	-	-	Used for high strength applications.
AISI 316L Ferrite free	-	-	CF3M (Low Ferrite)	Austenite	Solution Annealed	49.47	21.09	30	Used in hot zinc bath for galvanizing operations.
AISI 317	J93000	1.4438	CG8M	Austenite	Solution Annealed	53.00	29.63	30	Parts for pulp and paper mill equipments and chemical process industries.
6 Mo	J93254	-	CK3MCuN	Austenite	Solution Annealed	56.10	26.52	35	-
AISI 317L	J93000	1.4438	CG8M	Austenite	Solution Annealed	53.00	29.63	30	Parts for paper mill, chemical and hot dip galvanizing industries.

AISI 317LN	-	1.4442	CG3MN	Austenite	Solution Annealed	53.00	29.63	30	Handling of sulphur, pulp liquer dyestuffs, sulphuric acids.
AISI 310MoLN	-	1.4466	-	Austenite	Solution Annealed	55.08	25.5	-	-
CN7M (28Ni21Cr2.5Mo)	N08007	-	CN7M	Austenite	Solution Annealed	43.60	17.58	35	Used in food processing, munitions manufacturing, rayon manufacturing, oil refining, paints, pharmaceuticals, synthetic rubber, soap, textile & dye industries.
904L (25Ni20Cr4Mo)	N08904	1.4539	-	Austenite	Solution Annealed	43.60	17.58	35	Used in food processing, munitions manufacturing, rayon manufacturing, oil refining, paints, pharmaceuticals, synthetic rubber, soap, textile & dye industries.
CG6MMN	J93790	1.3964	CG6MMN	Austenite	Solution Annealed	59.67	30.09	30	Similar to Nitronic 50
CF10SMnN	J92972	-	CF10SMnN	Austenite	Solution Annealed	59.67	30.09	30	Similar to Nitronic 60
Alloy 28	N08028	-	-	Austenite	Solution Annealed	-	-	-	-
R-55 (58Ni23Cr4Mo)	-	-	-	Austenite	Solution Annealed	50.50	28.05	4	Used in pumps, valves and other process equipments for viscose rayon plants used in severe corrosive

									conditions.
Alloy 400 M35 (65Ni30Cu)	N24135	-	ASTM A494 M35-1	-	-	45.90 - 63.00	22.60 - 28.00	25	Suitable for sea water applications. Exhibits high resistance to destructive chemical action & mechanical wear.
M30-H	N24030	-	ASTM A494 M30-H	-	-	70.00	42.00	10	Used in rotating parts because it combines corrosion resisstance with high strength and wear resisitance.
Alloy 600	N06040	-	ASTM A494 CY40	Austenite	Solution Annealed	49.47	19.89	30	Used to handle hot corrosives under moderately oxidizing conditions due to its high resistance to intergranular attack and stress corrosion cracking. Can be used from cryogenic temperature upto 1093^{o}C.
CW6M	N30107	Chlorimet Alloy 3	ASTM A494 CW6M	Austenite	High Temperature Solution Annealed	50.49	28.05	25	Resists oxidizing agents such as wet chlorine, chlorine gas, hypochlorite, chlorine dioxide solutions, ferric chloride and nitric, hydrochloric and sulphuric acids at moderate temperature.
Alloy 625	N26625	-	ASTM A494 CW6MC	Austenite	Solution Annealed	49.47	28.05	25	Can be used from cryogenic temperature up to 1000°C with high corrosion resistance. Used in chemical

									processing equipment, ship and submarine parts and nuclear reactors.
Alloy 825	N08826	-	ASTM A494 Cu5MCuC	Austenite	Solution Annealed and Stabilized	53.04	24.48	20	Phosphoric acid evaporator, pickling equipment , chemical processing vessels and piping, equipment for recovery of spent nuclear fuel.
Alloy C-276	N30002	-	ASTM A494 CW12MW	Austenite	Solution Annealed	50.63	28.12	4	Exhibits outstanding resistance to highly corrosive chemicals such as wet chlorine, strong hypochloride solutions, hydrochloric acid, sulphuric acid and nitric acid at moderate temperatures or under oxidizing conditions.
Alloy C (Mod)	N26455	-	ASTM A494 CW2M	Austenite	Solution Annealed	50.49	28.05	20	Outstanding high temperature stability. Exhibits good ductility and corrosion resistance suitable for most chemical process application in as welded condition. Resistance to stress corrosion cracking and oxidizing atmosphere up to 1040^{o}C
Alloy C-22	N26022	-	ASTM A494 CX2MW	Austenite	Solution Annealed	56.10	31.62	30	Used for acetic acid, acetic anhydride production, chlorination systems,

									complex acid mixtures, electro galvanizing rolls, flue gas scrubber systems, hydrogen fluoride scrubber system and nuclear fuel reprocessing.
CX2M	N26059	-	ASTM A494 CX2M	Austenite	High temerature Solution Annealed	50.49	27.54	40	Acetic acid, acetic anhydride production, chlorination systems, complex acid mixtures, electro galvanizing rolls, flue gas scrubber systems, hydrogen fluoride scrubber system, incineration scrubber systems and nuclear fuel reprocessing.
Alloy B	N30012	-	ASTM A494 N12MV	Austenite	Solution Annealed	53.00	28.05	6	Excellent resistance to all concentrations of sulphuric acid upto 650C and good resistance upto the boiling point in the concentration range of 10-60%. Highly resistance to acetic acid exposure.
Alloy B (Mod)	J30007	Chlorimet Alloy 2	ASTM A494 N7M	Austenite	Solution Annealed	53.55	28.05	20	Suitable for equipment handling hydrochloric acid in all concentration and temperature. Resistant to hydrogen chloride gas and sulphuric, acetic and phosphoric acids. Exposure between 540^{o}C to 815^{o}C should be avoided.

Alloy G	N06007	-	-	Austenite	Solution Annealed	72.00	32.00	61	Used in chemical application, particularly those involving sulphuric and phosphoric acid, pulp digestion operations, dissolver vessels and attendant equipment for spent nuclear fuel elements.
Alloy W	N10004	-	-	Austenite	Solution Annealed	87.00	38.00	55	Exceptional strength and oxidation resistance upto 1200C. Used in many industrial furnace applications due to its resistance to oxidizing, neutral and carburizing atmosphere.
Alloy X	N06002	-	-	Austenite	Solution Annealed	-	-	-	Exceptional strength and oxidation resisitance upto 1200^{o}C. Used in many industrial furnace applications because of its resistance to oxidizing, neutral and carburizing atmosphere.
Ni-Resist AFG 1	-	-	ASTM A436 Type 1	Austenite	As Cast	17.54	-	-	Mechanical seals & their machinery for the production of single superphosphate and related fertilizers.
Ni-Resist AFG 2	-	-	ASTM A436 Type 2	Austenite	As Cast	17.54	-	-	Mechanical seals & their machinery for the production of single

superphosphate and related fertilisers