

STAINLESS STEEL REFERENCES

Grade: 304L 316L _____
 Seam: Welded Seamless WPWX
 Source: Import Domestic BAA AIS _____

TYPES			
4 Major Types of Stainless Steel		Description	Common Uses
Austenitic		most widely used, 7% Nickel Content, Flexible, not hardenable by heat treating	houseware products, industrial piping and vessels, constructional structures, architectural facades
Ferritic		better corrosion resistance than mild steel, similar properties to mild steel	washing machines, boilers, indoor architecture
Martensitic		very strong steel, ~13% Chromium, Duplex : higher resistance to chloride than austenitic, contains about 22-25% Chrome and 5% Nickel with Moly and Nitrogen.	knives and turbine blades, Duplex : chemical plants and piping applications
Precipitation Hardening Subtypes		Chrome-Nickel Stainless, contain alloying additions like: aluminum, copper or titanium, allows for steels to be hardened by a solution of aging treatment.	can be either austenitic or martensitic in ages condition, commonly used in aerospace and energy industries
Major Type	Description	Common Uses	
303	Austenitic	most machinable of austenitic ss grades, added sulfur to enhance machinability, resistant to atmospheric corrosion, food products, sterilization solutions, organic and inorganic chemicals	shafts, valve bodies, valve trim and food industry applications
304	Austenitic	most common stainless, low carbon austenitic alloy, contains max .03% of carbon, minimizes carbide precipitation during welding	welding, shafts, valve bodies, valve trim and food industry applications
310	Austenitic	superb high temperature properties, good ductility and weldability, resists oxidation in continuous service at a temp up to 1150° C without the presence of sulfur gases, can be used for intermittent service at temperature 1040° C	molten salt, sulfur bearing gas, heat exchanger and recuperator tubing
316	Austenitic	second most common ss, added moly to prevent specific forms of corrosion, carbon is kept at .03% max to show minimized carbide precipitation, decreased sulfur, resistant to chloride corrosion	electro-polishing, welding, marine applications, textile industry, food industry, watches, pharmaceutical equipment, valve bodies, bleaching and dyeing equipment
317	Austenitic	molybdenum-bearing austenitic chrome nickel, higher alloy content than 316 ss	developed to resist the attack of sulfurous acid compounds
321	Austenitic	titanium bearing stainless, stabilized against carbide precipitation, combines with titanium in higher temperatures to form harmless titanium carbide, chrome maintains full corrosion resistance, titanium added at least 5x carbon plus nitrogen contents	aircraft exhaust stacks, manifolds, chemical processing equipment, welding, jet engine parts
347	Austenitic	columbium/tantalum stabilized austenitic ss, good intergranular-corrosion, resistant to atmospheric conditions	aircraft exhausts, expansion joints, high chemical processing, should be considered for application in intermittent heating between 800° F and 1650° F
410	Martensitic	hardenable martensitic alloy, good corrosion resistance, designed for high stress parts that need high ductility and corrosion resistance	for working temps up to 1200° F, blades, buckets, steam turbines, turbine wheels, valves, aircraft parts, pumps, and pump shafts
416	Martensitic	highest machinability of any ss, made up of ~85% of a free-machining carbon steel, added sulfur to form manganese sulfide inclusions, less corrosion resistance than 410	welding, used in hardened/unhardened and highly tempered conditions because of low cost and ready machinability
630	Precipitation Hardening	Chromium-copper precipitation hardening stainless steel, high strength is maintained to approx. 316° C	used for applications requiring high strength and a moderate level of corrosion resistance
17-4 PH	Precipitation Hardening	precipitation hardening martensitic ss, with Cu and Nb/Co additions, high strength, hardness (in temps up to 572° F/300° C), and adequate corrosion resistance	aircraft and aerospace materials, fasteners, base plates, oil and petroleum refining equipment
15-5 PH	Precipitation Hardening	martensitic precipitation hardened steel, offers high strength, excellent corrosion resistance, similar properties to 17-4 ph., more chemically balanced	valve parts, paper mills, aircraft, power generation chemical processing, nuclear and space craft
904L	Austenitic	non-stabilized low carbon high alloy austenitic ss, added copper for improved resistance, highly resistant to chloride attack, non-magnetic in all conditions, excellent weldability and formability	used less due to cheaper substitute duplex stainless steel 2205 (S31803 or S32205)
2205	Austenitic and Ferritic	Duplex 2205, has microstructure that contains both austenitic and ferritic phases, good strength and corrosion resistance, twice the strength of typical austenitic stainless	oil, pump and pump parts, valves, chemical and paper manufacturing
2507	Austenitic and Ferritic	Super Duplex 2507*: similar to UNS S31803 Duplex; longer lifespan, higher corrosion resistance; composed of: 24-26% of chromium, 6- 8% nickel, 3% molybdenum, 1.2% manganese; more cost effective than high nickel alloys, high level of thermal conductivity	oil and gas, chemical processing, desalination equipment, paper mill equipment, hydraulic and instrumentation products
Alloy 20	Austenitic	super-austenitic stainless alloy, max corrosion resistance to sulfuric acid and other aggressive environments, nickel-iron-chromium based alloy with additions of copper and molybdenum	pharmaceuticals, food, explosives, chemical processing, petroleum refinement
Nickel 200		essentially pure nickel, good corrosion resistance, ferromagnetic, low electrical resistivity	food handling equipment, caustic solution, for devices requiring magnetic actuated parts
Nickel 201		low carbon modification of Nickel 200, preferred over Nickel 200 in temps above 600° F (315° F)	for electronic industry at temps up to 1200° F (649° C)
Alloys	Alloy Type	Description	Common Uses
Alloy 400	Monel, nickel/copper alloy	machinable, easily fabricated, excellent strength, corrosion resistance, ductility, and weldability	areas with salt water and brackish water, not susceptible to stress corrosion cracking
Alloy 600	Inconel, nickel/chrome/iron alloy	acid resistant, high strength & good workability under various temperatures, resistance to corrosion and heat	jet engines, super heaters, food processing, steam generators
Alloy 625	UNS N06625, nickel-chromium-molybdenum alloy	high strength in temps up to 1500° F, oxidation resistance up to 1800° F, good corrosion resistance	aerospace and marine engineering, chemical processing, pollution-control equipment, nuclear reactors
Alloy 800	Incoloy, nickel-iron/chrome alloy + copper and moly	general corrosion resistance, pitting and crevice corrosion in chemicals containing chlorides, sulfuric, nitric, and phosphoric acids	tanks, piping, heat exchangers, pumps, valves
Alloy 825	titanium stabilized austenitic nickel/iron/chrome alloy + copper and moly	resistance to oxidizing and non-oxidizing hot acids, resistant to pitting and crevice corrosion	salt-water cooled heat exchangers, offshore piping tube systems, evaporators, scrubbers
Alloy C-276	Hastelloy, nickel-moly-chrome alloy + tungsten	corrosion resistant, resistant to pitting and crevice corrosion, resists stress corrosion cracking, oxidation resistant up to 1900° F	tanks, piping, heat exchangers, pumps, valves