GUIDE TO SELECTION

STAINLESS STEEL

CHROME-NICKEL, NON-HARDENING, AUSTENITIC (NON-MAGNETIC)

201 (UNS S20100) An austenitic stainless steel formulated to have lower and more stable cost due to the substitution of lower cost manganese and nitrogen for a portion of the nickel found in the 300 series alloys, making this a more economical alloy. This grade possesses a desirable combination of economy plus good mechanical and corrosion properties and is used in a wide variety of consumer and transportation applications.

201LN (UNS S20153). An austenitic stainless steel that was originally developed for sub-zero temperature applications, but which is also well suited for structural applications at ambient temperatures such as truck trailer, railroad freight cars, coal handling and other transportation equipment where good corrosion resistance, strength and toughness are needed.

301 (UNS S30100) Lower nickel and chrome than T-304 combine with slightly higher carbon content give T-301 increased cold work-hardening range. This permits higher tensile strengths to be achieved. However the corrosion properties are not as good and the grade is more susceptible to carbide precipitation during welding which restricts its use in some applications in favor of T-304 or 304L.

303 (S30300). Free machining variation of T302/304 for use in automatic machining operations. Corrosion resistant to atmospheric exposures, sterilizing solutions, most organic and many inorganic chemicals, most dyes, nitric acid and foods.

304 (S30400). The most widely used of the stainless and heat resisting steels. Offers good corrosion resistance to many chemical corrodents as well as industrial atmospheres. Has very good formability and can be readily welded by all common methods. 304 Prodec offers improved machinability.

304L (S30403). Extra low carbon variation of T304 avoids harmful carbide precipitation due to welding. Same corrosion resistance as T304. Slightly lower mechanical properties than T304. 304L Prodec offers improved machinability.

309/309S (S30900, S30908). Used in high temperature applications. High scale resistance. Corrosion resistance superior to 304. Excellent in resisting sulfite liquors, nitric acid, nitric-sulfuric mixtures, acetic, citric and lactic acids. 309S (.08 max. carbon) resists corrosion in welded parts.

310/310S (S31000, S31008). Higher alloy content improves the characteristics of 309. Corrosion resistance better than 304. Excellent oxidation resistance. 310S (.08 max. carbon) offers improved corrosion resistance in welded components.

316 (S31600). Better corrosion and pitting resistance as well as higher strength at elevated temperatures than T304. Used for pumps, valves, textile and chemical equipment, pulp & paper and marine applications. 316 Prodec offers improved machinability.

316L (S31603). Extra low carbon variation of T316 to avoid carbide precipitation due to welding. Same excellent corrosion resistance of T316. 316L Prodec offers improved machinability.

317L (S31703). Moly bearing austenitic steel with alloy content somewhat higher than 316. This chemistry gives 317L superior corrosion resistance in difficult environments, as well as higher creep, stress-to-rupture and tensile strengths at elevated temperatures. Applications include FGD scrubbers, chemical and petrochemical processing equipment and pulp and paper equipment.

321 (S32100). Stabilized with titanium for weldments subject to severe corrosion. No carbide precipitation. Excellent resistance to a variety of corrosive media. Immune to most organic chemicals, dyestuffs and many inorganic chemicals.

254 SMO (UNS S31254) is an austenitic specialty stainless steel designed for maximum resistance to pitting and crevice corrosion. With high levels of chromium, molybdenum and nitrogen, 254 SMO is especially suited for high chloride environments such as brackish water, seatwater, pulp mill bleach plants and other high chloride process streams.

Nitronic® 30 A nitrogen-strengthened stainless developed for applications requiring a good level of aqueous corrosion resistance combined with good resistance to abrasive and metal-to-metal wear. Applications include conveyors, hoppers, chutes, mixing equipment, screens, wear plates — anywhere there is wet sliding abrasion.

Nitronic® 50 (S20910) (Formerly 22-13-5). A nitrogen-strengthened austenitic stainless that provides a combination of corrosion resistance and strength. Corrosion resistance greater than that of T316 and T316L plus approximately twice the yield strength. Very good mechanical properties at both elevated and subzero temperatures.

Nitronic® 60 (S21800). Excellent galling resistance, corrosion resistance comparable to T304 plus approximately twice the yield-strength. Metal-to-metal abrasive wear resistance is also good.

CHROME, HARDENABLE MARTENSITIC (MAGNETIC)

410 (S41000). Heat-treatable stainless used widely where corrosion is not severe — air, fresh water, some chemicals and food acids. Typical uses include valve & pump parts, fasteners, cutlery, turbine parts, bushings.

410 DOUBLE TEMPERED (S41000). Quenched and double tempered variation of T410 conforming to NACE MR-01-75 API 6A Type III. For parts used in hydrogen sulfide (H_2S) service.

416 (S41600). Free-machining variation of T410 with useful corrosion resistance to natural food acids, basic salts, water and most atmospheres.

422 (S42200). A martensitic stainless steel designed for service temperatures up to 12008 F with a good combination of high strength and toughness. It is used in steam turbines as blading and bolting material.

440 C (S44004). A high carbon (.95/1.20%C) chrominum steel that can attain the highest hardness (Rockwell C60) of any standard stainless grade. In the hardened and stress relieved condition, 440 C has maximum hardness together with high strength and corrosion resistance. Also has good abrasion resistance. 440 A is lower carbon variety (.60/.75%C) which results in lower hardness but greater toughness in the hardened condition.

CHROME, NON-HARDENABLE FERRITIC (MAGNETIC)

409 (S40900). Lowest cost stainless — used extensively in automotive exhaust systems. Because of its combination of economy and good resistance to oxidation and corrosion, it creates opportunities to economically improve the performance of a wide range of parts where surface appearance is not important.

430 (S43000). Is the most popular of the non-hardenable chromium stainless steels. It combines good corrosion and heat resistance with good mechanical properties. Oxidation resistance to 15008 F widely used in both industrial and consumer products.

439 (UNS S43035) Is a ferritic stainless steel that outperforms 409 in both oxidation resistance and corrosion resistance. The addition of titanium as a stabilizer helps this grade avoid the loss of ductility after welding and to provide resistance to intergranular corrosion common to grades like T-430 used in the as-welded condition. Most applications have been in automotive exhaust and residential furnace heat exchangers; however more interest has been seen in commercial food equipment markets of late.

441 (UNS S44100). Is a ferritic stainless steel that is dual stabilized with both titanium and columbium, which lessens the prevalence of titanium stringers often seen in the surface of T-439. Slightly higher chromium levels (17.5% than T-439 17.0%) T-441 has been more widely used in industrial applications, but interest in consumer products such as household appliances has been occurring as a substitute for higher cost nickel bearing stainless steels.

PRECIPITATION HARDENING, MARTENSITIC (MAGNETIC)

17-4/Type 630 (S17400). A precipitation hardening grade combining high strength and hardness with corrosion resistance similar to T304 in most media. Simple low temperature heat treatment at 900/11508 F eliminates scaling and prevents excessive warpage.

17-4 DOUBLE AGED H1150 (S17400). Solution annealed then double age hardened to procedure #1 in NACE MR 01-75. Used in many pressure control applications in the energy market.

15-5 (S15500). A vacuum arc remelted grade which offers high strength and hardness. Excellent corrosion resistance plus excellent transverse toughness.

CHROME, NICKEL DUPLEX — 50% AUSTENITIC/50% FERRITIC

2205 (UNS S32205). A duplex stainless steel that is a nitrogen enhanced alloy, used in environments where resistance to general corrosion and chloride stress corrosion cracking is important. Applications include power generation, oil & gas, chemical processing and desalination.

STANDARD STAINLESS STEEL SHEET FINISHES

#1 finish — hot rolled, annealed and pickled

#2D finish — annealed, pickled and dull cold rolled

#2B finish — annealed, pickled and bright cold rolled

#3/#4 finish — polished finish obtained with the use of abrasive belts

BA finish — (Bright Annealed) bright cold rolled and controlled atmosphere annealed to retain highly reflective finish

Rolled On finish — obtained by cold rolling on embossed rolls, appearance similar to mechanical polish