

Stainless Steel Grades Chart

Stainless steel is a material with tons to offer. Its popularity also means there are seemingly a million different types of **stainless steel grades**. (Actually, there are a few hundred.)

As a general rule, stainless deserves consideration if your engineering project requires at least one of these qualities:

- A shiny, beautiful appearance
- Corrosion and oxidation resistance
- Strength at various temperatures

Here's a stainless steel grades chart so you can get the best out of your tubular steel project:

GRADE	TYPE	TRAITS	USES
3CR12	Ferritic	Useful corrosion resistance, particularly in wet abrasion environments. Readily welded and formed.	Tanks, flues, bins, chutes, rail wagons
201	Austenitic	Low nickel, high work hardening	Cookware, hose clamps
301	Austenitic	Combination of strength and ductility to withstand severe forming methods. Corrosion resistance comparable to 302.	Rail cars, automotive components
302	Austenitic	Excellent corrosion resistance. High strength and hardness.	Food and drink, sanitary, cryogenic and pressure-containing applications
303	Austenitic	Addition of sulfur or selenium gives it best machinability of all austenitic grades, but reduces corrosion resistance compared to 304.	Nuts and bolts, aircraft fittings and gears, bushings

304 304L 304H	Austenitic	Slightly magnetic when cold worked. Excellent corrosion resistance but susceptible to pitting corrosion in warm chloride environments. Excellent toughness Accounts for 50% of all stainless steel produced.	Architecture, kitchens, food processing
309S	Austenitic	Resistant to oxidation.	Heating elements, furnace parts
316 316L 316H	Austenitic	Same mechanical and physical properties as 304 but more resistant to pitting corrosion, especially in warm chloride environments. Virtually non-magnetic.	Marine architectural components, food processing, hot water systems
317L	Austenitic	Improved corrosion resistance over 316. 317L is a variation of 317 suitable for heavy-gauge welding.	Pulp and paper machinery, ink and dyeing processes, acetic acid distillation
321	Austenitic	Titanium-stabilized.	Aircraft, heat exchangers (up to intermediate temperatures)
400	Ferritic	Corrosion resistance comparable to 409, better surface finish	Caskets, applications requiring better finish than 409

409, Aluminized 409	Ferritic	Resists atmospheric and automotive exhaust gas corrosion. Aluminized version adds salt and cosmetic corrosion resistance.	Auto exhaust systems, heat exchangers, furnace liners
410, 410H	Martensitic	Resists dry atmospheres, fresh water, mild alkalis and acids, steam, and hot gases. Must be hardened for optimal heat and corrosion resistance. Hardenability increases with 410H.	Bolts, nuts, screws, pump parts and shafts, steam and gas turbine parts, mine ladder rungs, cutlery, rulers, cold heading
420, 420HC	Martensitic	Good resistance in hardened condition to the atmosphere. Higher carbon hardenable grade. HC offers better hardenability.	Cutlery, surgical instruments, needle valves
430, 430F	Ferritic	Good combination of corrosion resistance, formability, mechanical properties. 430F is suitable for high-speed machining, but corrosion resistance is lower.	Automotive trim, refrigerator doors, element supports, cold-headed fasteners
431	Martensitic	Excellent resistance to wide variety of corrosive media, approaching that of 304. High tensile, torque strength.	Pump and boat shafts, nuts, bolts, marine hardware

434	Ferritic	Molybdenum use improves pitting resistance over 430.	Automotive trim components
435 Mod.	Ferritic	Improved formability and weldability.	Automotive trim
436	Ferritic	Controlled roping.	Automotive trim
439	Ferritic	Titanium-stabilized. 18% chrome alloy with low carbon content. Corrosion resistance to variety of oxidizing environments. Pitting corrosion resistance.	Nuclear, automotive, power generation, chemical processing, and consumer appliances
440	Martensitic	High-carbon, moderate corrosion resistance, superior strength and hardness.	Knives, ball bearings, gauge blocks, dies
444	Ferritic	Resistant to oxidation, corrosion, and stress cracking.	Water heaters, engine components, solar panels
904L	Austenitic	'Super austenitic' grade with very high corrosion resistance, especially to strong acids and chlorides.	Sulphuric acid service
2205	Ferritic/Austenitic	Approximately 50% ferrite and 50% austenitic. High strength and hardness. Resistant to erosion, fatigue, stress corrosion cracking, and pitting and crevice corrosion.	Marine, chemical, and petrochemical industries
41003	Ferritic	Excellent weldability, toughness, and fabricating characteristics	Tubing for bus frames, hopper cars, chutes, storage tanks, shipping containers
UR52N	Ferritic/Austenitic	'Super duplex' grade with exceptional resistance to hot chlorides and sulfides. High in strength.	Marine, chemical, and petrochemical industries

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