ARCUS WIRE GROUP
MARINE • INDUSTRIAL • ARCHITECTURAL

STAINLESS STEEL INFORMATION SHEET

Stainless steel

Stainless steels are usually classified into five groups: Austenitic, Ferritic, Martensitic, Duplex (combination of Ferritic and Austenitic), and finally Precipitation-hardening.

Austenitic stainless steels contain 16-21% Chromium, 8-14% Nickel and other elements. This stainless group has a face-centered cubic structure and can be hardened by cold working, but not by heat treatment. In the annealed state, all are essentially non magnetic, but slight magnetism does form through cold forming. Austenitic stainless are excellent corrosion resistant, usually good formability and increases in strength as a result of cold forming. Type 316 is the mostly widely accepted grade with a balance performance while type 304 is the cheaper cousin with lower corrosion resistance.

Ferritic stainless steels contain 10,5-30% Chromium, not over 0,1% of Carbon and other elements. This stainless group has a body-centered cubic crystal structure and is magnetic with good ductility and fair resistance to corrosion or oxidation. Ferritic stainless performs poorly in both high and low temperatures compared to Austenitic grades. Typical ferric grades include type 405, 408, 409.

Martensitic stainless steels contain 12-14% Chromium, 0,2-1% Molybdenum and higher carbon content between 0,1-1,2% Carbon. The high Carbon content gives these Martensitic stainless a higher tensile but also makes them more brittle. This stainless group has a distorted body-centered cubic crystal structure and is usually quenched and magnetic. Typical Martensitic grades include type 410, 416, 420, 430 and 440.

Duplex stainless steels contain high Chromium levels between 19-28%, up to 5% Molybdenum but lower Nickel than Austenitic grades. This stainless group has a mixture of Austenitic face-centered and Ferritic body-centered cubic structures. Most duplex alloys are typically designed with equal parts of austenite and ferrite, but some commercial alloy may be 60% austenite to 40% ferrite. Duplex grade stainless typically posses higher strength over Austenitic grade, and has an improved characteristic in localized pitting/cracking or crevice corrosion.

Precipitated hardening stainless steel contains 17% Chromium and 4% Nickel. This grade of stainless steel uses elements such as aluminum, copper or titanium to precipitate harden their structure. These may result in either Austenitic or Martensitic annealed conditions. Austenitic conditions can be solution-treated to become Martensitic with sub zero temperature. Also commonly referred to as PH17-4 and type 630, this grade of stainless has a comparable corrosion resistance to Austenitic grades, but can posses even higher strength than Martensitic grade when solution treated.

Material composition (AISI standards)

Description	Chemical Composition C%	Cr%	Mo%	Ni%
Standard material 304 of Casting (CF-8)	≤0.08	18.00-21.00	-	8.00-11.00
Standard material 304 of Non-Casting (304)	≤0.08	18.00-20.00	-	8.00-11.00
Standard material 316 of Casting (CF-8M)	≤0.08	18.00-21.00	2.00-3.00	9.00-12.00
Standard material 316 of Non-Casting (316)	≤0.08	16.00-18.00	2.00-3.00	10.00-14.00

Note : All casting sections of this catalog have been examined with spectra analysis for their chemical compositions and tested under internal lab settings of temperature 25 C ±3 C, humidity 45% ±10% . Non-casting sections are certified by their respective suppliers.


68 % Chromium


60-63 % Molybdenum


99.8 % Nickel

Comparison chart of major international standards

USA AISI	Japan JIS	Great Britain B.S.	Germany DIN	EN / DIN W.-Nr
CF-8	SCS 13	304 C 15	GX5 CrNi 19-10	1.4308
304	SUS 304	304 S 15	X5 CrNi 18-10	1.4301
CF-8M	SCS 14	316 C 16	GX5 CrNiMo 19-11-2	1.4408
316	SUS 316	316 S 31	X5 CrNiMo 17-12-2	1.4401

Note : This comparison chart matches the closest relative standards of major international standards. Each international standard may still differ slightly.