

316/316L Stainless Steel

UNS S31600/S31603
W. Nr 1.4401/1.4404

Applicable Specifications

Strip and Foil AMS 5907, AMS 5524, ASTM F899, ASTM A666, NACE MR0175/ISO 15156

Description: 316 is an austenitic chromium-nickel-stainless steel containing molybdenum. This addition increases general corrosion resistance, improves resistance to pitting from chloride ion solutions, and provides increased strength at elevated temperatures. Properties are similar to those of Type 304/304L except that this alloy is somewhat stronger at elevated temperatures. Corrosion resistance is improved, particularly against sulfuric, hydrochloric, acetic, formic and tartaric acids; acid sulfates and alkaline chlorides. Type 316L is an extra-low carbon version of Type 316 that minimizes harmful carbide precipitation during welding.

Applications include: Exhaust manifolds, Furnace parts, Heat exchangers, Jet engine parts, Pharmaceutical and photographic equipment, Valve and pump trim, Tubing, Chemical equipment, Digesters, Tanks, Evaporators, Paper and textile processing equipment, Food processing equipment, and Marine parts.

Industries supplied include: Aerospace, Chemical Processing, Food Processing, Power Generation, General Manufacturing

Nominal Composition

	C	Mn	Si	S	P	Ni	Cr	Mo	N	Fe
min	-	-	-	-	-	10.5	16.5	2.00	-	Bal
max	0.07	2.00	1.00	0.030	0.045	13.5	18.0	2.50	0.10	-

Physical Properties

	At 70°F	At 20°C
Density	0.285 lb/in ³	8.00 g/cm ³
Modulus of Elasticity (E)	28.0 x 10 ³ ksi	193 GPa
Modulus of Rigidity (G)	10.1 x 10 ³ ksi	70 GPa
Coefficient of Expansion	9.2 μin/in-°F (70-212°F)	16.6 μm/m-°C (20-100°C)
Electrical Resistivity	29.1 μohm-in	74.0 μohm-cm
Thermal Conductivity	9.4 Btu-in/ft ² -hr-°F (212°F)	16.2 W/m-°C (100°C)

Typical Mechanical Properties

Condition	Heat Treatment	Tensile Strength	Suggested Operating Conditions
Annealed	1900-2050°F (1038-1121°C)	75-105 ksi (515-725 MPa)	-200°F to 1700°F (-184°C to 927°C)
¼ Hard ½ Hard Spring Temper	(Stress relieve 600-900°F as needed)	125 ksi min (860 MPa) 150 ksi min (1030 MPa) 185 ksi min (1275 MPa)	-200°F to 550°F (-184°C to 288°C)

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