# 310S Stainless Steel, UNS S31008

## Shaped, Flat, Square, Round, Fine, Plated and Bare Wire ASTM A167, AMS 5523

### 310s Alloy Description

Get A Quote

Alloy 310S is an austenitic chromium nickel stainless steel that posses good oxidation resistance and strength at high temperatures in continuous service up to 2000°F (provided reducing sulfur gasses are not present) It is also used for intermittent service at temperatures up to 1900°F because it resists rescaling and has a low coefficient of expansion. This factor reduces the tendency of the steel to warp in heat service. Alloy 310S is similar to alloy 310 except for lower carbon content to minimize carbide precipitation during welding.

### Applications

Furnace parts
Heat Exchangers
Paper Mill Equipment
Exhaust Parts in Gas Turbines
Jet Engine Parts
Oil Refinery Equipment

### Chemistry Typical

Carbon: 0.080 max
Manganese: 2.00 max
Silicon: 0.75 max
Chromium: 24.00- 26.00

Nickel: 19.00- 22.00
Molybdenum: 0.75 max
Phosphorus: 0.040 max

## Physical Properties

Density, 0.29 lbs/in$^3$ 9.01 g/cm$^3$

Electrical Resistivity: microhm-in (microhm-cm): 68°F (20°C): 37.0 (94.0)

Specific Heat: BTU/lb/°F (kJ/kg•K): 32-212°F (0-100°C): 0.12 (0.50)

Thermal Conductivity: BTU/hr/ft$^2$/ft/°F (W/m•K):
At 212°F (100°C): 8.0 (13.8)
At 932°F (500°C):10.8 (18.7)

Mean Coefficient of Thermal Expansion:in/in/°F (µm/m•K)
32-212°F (0-100°C): 8.0 x $10^{-6}$(14.4)
32-600°F (0-315°C): 9.3 x $10^{-6}$(16.7)
32-1000°F (0-538°C): 9.6 x $10^{-6}$(17.3)
32-1200°F (0-649°C) : 9.7x $10^{-6}$(17.5)

Modulus of Elasticity: KSI (MPa) 29.0 x $10^3$ (200 x $10^3$) in tension 11.2 x $10^3$ ( 78 x $10^3$) in torsion

Magnetic Permeability: H = 200 Oersteds: Annealed: < 1.02 max

Melting Range: °F (°C) 2550 – 2650 (1399 – 1454)

## Mechanical Properties at Room Temperature

**Properties: Annealed**
Ultimate Tensile Strength: 75 KSI min (515 MPA min)
Yield Strength (0.2% offset): 30 KSI min (205 MPA min)
Elongation: 40% min Hardness: Rb 95 max

**Properties: Tempered** 310S can be supplied in a various rolled tempered conditions. Contact Ulbrich Technical Service for details.

## Additional Properties

**Corrosion Resistance** Refer to NACE (National Association of Corrosion Engineers) for recommendations.

**Properties Tempered** Alloy 310S can be cold rolled to achieve the temper properties required by specific customers and/or manufacturing requirements. Contact Ulbrich Wire for details.

**Standard Wire Finishes**
Extra Clean: (XC) Extra clean is also referred to as “bright annealed” or “bright annealed and cold rolled”
Grease (round wire only): Drawn in a heavy grease produces an “Ultra bright” finish for decorative applications Soap (round wire only):
Soap is used as a lubricant in the drawing process and is not removed. It acts as a lubricant during customer part forming operation. A soap finish is available in tempered products.
Plated: Many plating options are available. ∗Special finishes are available: Contact Ulbrich Wire Sales with special finish and plating requests.

**Forms**
Continuous Coils
Cut to lengths
Precision cutting

**Cold Forming** Alloy 310S has a good ductility and can be rolled formed, stamped and drawn readily.

**Heat Treatment** Alloy 310S can only be hardened by cold working.

**Welding** For best results refer to: SSINA’s “Welding of Stainless Steels and Other Joining Methods”.

*Limitation of Liability and Disclaimer of Warranty: In no event will Ulbrich Stainless Steels*

*and Special Metals, Inc., be liable for any damages arising from the use of the information included in this document or that it is suitable for the 'applications' noted. We believe the information and data provided to be accurate to the best of our knowledge but, all data is considered typical values only. It is intended for reference and general information and not recommended for specification, design or engineering purposes. Ulbrich assumes no implied or express warranty in regard to the creation or accuracy of the data provided in this document.*