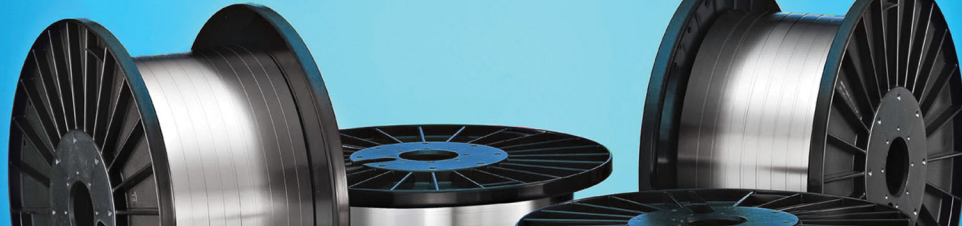




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# 317L STAINLESS STEEL, UNS S31703

**Strip, Coil, Foil, Wire, ASTM A167, ASTM A240**

## Applications

Chemical Processing, Food Processing, Oil Refineries, Paper Mills, Gas Scrubbers, Photographic Handling, and Marine Parts

## Description

Type 317L (UNS 31703) is a low carbon austenitic chromium-nickel stainless steel that can be used in applications where it is not possible to anneal after welding and where maximum corrosion resistance is required. It provides good oxidation resistance in intermittent service to 1600 °F and in continuous service to 1700 °F.

## Chemistry Typical

Carbon: 0.030 max  
Manganese: 2.00 max  
Silicon: 0.75 max  
Chromium: 18.00-20.00  
Nickel: 11.00-15.00  
Molybdenum: 3.00-4.00  
Phosphorus: 0.045 max  
Iron: Balance

## Physical Properties

Density: 0.29 lbs/in<sup>3</sup> 7.99 g/cm<sup>3</sup>

Electrical Resistivity: microhm-in (microhm-cm): 68 °F (20 °C): 31.19 (79.0)

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

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Thermal Conductivity: BTU/hr/ft<sup>2</sup>/ft/°F (W/m•K):

At 212 °F (100 °C): 9.4 (16.2)

At 932 °F (500 °C): 12.4 (21.4)

Mean Coefficient of Thermal Expansion: in/in/°F (µm/m•K)

32 - 212 °F (0 - 100 °C):  $8.9 \times 10^{-6}$  (16.0)

32 - 600 °F (0 - 315 °C):  $9.0 \times 10^{-6}$  (16.2)

32 - 1000 °F (0 - 538 °C):  $9.7 \times 10^{-6}$  (17.5)

32 - 1200 °F (0 - 649 °C):  $10.3 \times 10^{-6}$  (18.5)

32 - 1500 °F (0 - 871 °C):  $11.1 \times 10^{-6}$  (18.5)

Modulus of Elasticity: ksi (MPa)

$28 \times 10^3$  ( $193 \times 10^3$ ) in tension

$11.2 \times 10^3$  ( $77 \times 10^3$ ) in torsion

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

Creep Strength: 1% Flow in 10,000hrs. At 1000 °F: 24,000psi

Melting Range: 2500 - 2590 °F (1371 - 1421 °C)

## Forms

Coil – Strip, Foil, Ribbon

Wire – Profile, Round, Flat, Square

## Mechanical Properties at Room Temperature

### Properties: Annealed

Ultimate Tensile Strength: 75 KSI min (517 MPa min)

Yield Strength (0.2% Offset): 30 KSI min (205 MPa min)

Elongation: 35% min

Hardness: Rb 95 max

### Properties: Tempered

Type 317L can be cold rolled to tempers. Contact Ulbrich Technical Services for more details.

## Additional Properties

### Corrosion Resistance

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

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**Finishes**

# 1 – Hot rolled annealed and descaled. It is available in strip, foil and ribbon. It is used for applications where a smooth decorative finish is not required.

# 2D – Dull finish produced by cold rolling, annealing and descaling. Used for deep drawn parts and those parts that need to retain lubricants in the forming process.

# 2B – Smooth finish produced by cold rolling, annealing and descaling. A light cold rolling pass is added after anneal with polished rolls giving it a brighter finish than 2D.

#BA – Bright annealed cold rolled and bright annealed

#CBA – Course bright annealed cold rolled matte finish and bright anneal

#2 – Cold Rolled

# 2BA – Smooth finish produced by cold rolling and bright annealing. A light pass using highly polished rolls produces a glossy finish. A 2BA finish may be used for lightly formed applications where a glossy finish is desired in the formed part.

Polished – Various grit finish for specific polish finished requirements.

*\* Not all finishes are available for all alloys – Contact Ulbrich Sale for more information.*

**Wire Finishes**

XC – Extra clean bright annealed or bright annealed and cold rolled

Grease – Ultra-bright finish (for decorative applications)

Soap – Soap is not removed from tempered wire to act as a lubricant.

*\* Contact Ulbrich Wire for custom wire finishes.*

**Cold Forming**

Type 317L can be readily formed and drawn.

**Heat Treatment**

Type 317L is non hardenable by heat treatment and can only be hardened by cold working.

**Welding**

For best results refer to: SSINA's "Welding of Stainless Steels and Other Joining Methods".

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