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## 304 STAINLESS STEEL, UNS S30400

**Strip, Coil, Foil & Wire, AMS 5513, AMS 5910 (1/4H), AMS 5911 (1/2H),  
AMS 5912 (3/4H), AMS 5913 (FH), AMS 5501 (1/4H), ASTM A666**

### Applications

Air Bag Sensors, Flexible Hoses, Hypodermic Needles, Oil Well Filter Screen, Pressure Vessels, Surgical Instruments, Cryogenic Components, Hinges, Bellows, Clamps

### Description

Stainless Steel Grade 304 is the standard 18/8 (18% chrome, 8% nickel) austenitic stainless steel. It is a non-magnetic alloy in the annealed condition but becomes magnetic as it is cold worked. It is the most commonly used of all stainless grades. T304 can be easily welded and is the choice for many deep drawn, spun or formed parts due to its high ductility.

### Chemistry Typical

Carbon: 0.08 max  
Manganese: 2.00 max  
Phosphorus: 0.040 max  
Sulfur: 0.030 max  
Silicon: 1.00 max  
Chromium: 18.00- 20.00  
Nickel: 8.00- 10.00  
Copper: 0.75 max  
Molybdenum: 0.75 max  
Iron: Balance

### Physical Properties

Density: 0.29 lbs/in<sup>3</sup> 8.03 g/cm<sup>3</sup>

Electrical Resistivity: microhm-in (microhm-cm):

68 °F (20 °C): 28.4 (72)

1200 °F (659 °C): 45.8 (116)

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

Thermal Conductivity: BTU/hr/ft<sup>2</sup>/ft/°F (W/m•K):  
At 212 °F (100 °C): .4 (16.2)  
At 932 °F (500 °C): .4 (21.4)

Mean Coefficient of Thermal Expansion: in/in/°F,m/m•K)  
32 – 212 °F (0 – 100 °C) – 9.4 x 10<sup>-6</sup> (16.9)  
32 – 600 °F (0 – 315 °C) – 9.6 x 10<sup>-6</sup> (17.3)  
32 – 1000 °F (0 – 538 °C) –10.2 x 10<sup>-6</sup> (18.4)  
32 – 1200 °F (0 – 649 °C) –10.4 x 10<sup>-6</sup> (18.7)

Modulus of Elasticity: ksi (MPa)  
28 x 10<sup>3</sup> (193 x 10<sup>3</sup>) in tension  
11.2 x 10<sup>3</sup> (78 x 10<sup>3</sup>) in torsion

Magnetic Permeability, H = 200 Oersteds: Annealed < 1.02

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

## Forms

Coil – Strip, Foil, Ribbon  
Wire – Profile, Round, Flat, Square  
Bar (Canada only) – Round, Flat, Square  
Sheet (Canada only)  
Plate (Canada only)  
Diamond Plate (Canada only)  
Tubing (Canada only) – Round, Square, Rectangular  
Structural Angle (Canada only)

## Mechanical Properties at Room Temperature

### Annealed:

Ultimate Tensile Strength: 75 KSI min (517 MPA min)  
Yield Strength (0.2% Offset): 30 KSI min (205 MPA min)  
Elongation: 40% Min  
Hardness: B92 max

### Tempered Condition:

304 can be provided in the tempered condition. Please refer to Ulbrich Technical Services for more information.

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## Additional Properties

### Corrosion Resistance

304 has excellent corrosion resistance and is used in many corrosive environments and atmospheres. Please refer to NACE (National Association of Corrosion Engineers) for recommendations.

### 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 in all alloys – Contact Ulbrich Sales 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 coating on tempered wire to act as lubricant.

*\*Contact Ulbrich Wire for custom finishes.*

### Cold Forming

304 is ductile and can be cold worked by stamping, drawing, bending or forming methods.

### Heat Treatment

304 is non hardenable by heat treatment. It 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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