304 Stainless Steel, UNS S30400

Shaped, Flat, Square, Round, Fine Wire, Plated and Bare Wire
ASTM A240, ASTM A276, ASTM A 313, ASTM 479,AMS 5513, AMS 5910, AMS 5911, AMS 5912, AMS 5913, AMS 5501, ASTM A666

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304 Alloy Description

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

Applications

Screens for oil and water wells, fish screens, coal, pulp and paper
Architectural applications
Circuit breaker components.
Surgical instruments
Home appliances
Food processing equipment.
Hose clamps and fasteners

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

Physical Properties

Density: 0.29 lbs/in^3 8.03 g/cm^3

Electrical Resistivity microhm-in (microhm-cm):
At 68°F (20°C): 28.4 (72)
At 1200°F (659°C): 45.8 (116)

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

Thermal Conductivity, BTU/hr/ft^2/ft/oF (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/oF(µm/m•K):
32-212°F (0-100°C): 9.4×10^{-6} (16.9)
32-600°F (0-315°C): 9.6×10^{-6} (17.3)
32-1000°F (0-538°C): 10.2×10^{-6} (18.4)
32-1200°F (0-649°C): 10.4×10^{-6} (18.7)

Modulus of Elasticity, KSI (MPa)
28.0×10^3 (193×10^3) in tension
11.2×10^3 (78×10^3) in torsion

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

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

Mechanical Properties at Room Temperature

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

Properties Tempered

1/4 Hard
Ultimate Tensile Strength: 125-150 KSI (861-1034 MPa)
Yield Strength (.2% offset): 100-130 KSI (689-827 MPa)
Elongation: 10 % nominal

Full Hard
Ultimate Tensile Strength: 155-170 KSI (1068-1172 MPa)
Yield Strength (.2% offset): 130-150 KSI (896-1034 MPa)
Elongation: 2-8%

•Alloy 304 can be supplied in a wide range of rolled tempered condition. Contact Ulbrich Wire Technical Service for details

Additional Properties

Corrosion Resistance
Alloy 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.

Standard Wire Finishes
Extra Clean: 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 304 is ductile and can be cold worked by stamping, drawing, bending or forming methods.

Heat Treatment

Alloy 304 cannot be heat treated for hardness

Stress Relieving

300 to 750 degrees Fahrenheit for cold worked parts with times typically no more than 120 minutes.

Welding

Refer to SSINA's 'Welding of Stainless Steels and Other Joining Methods' for best practices.

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