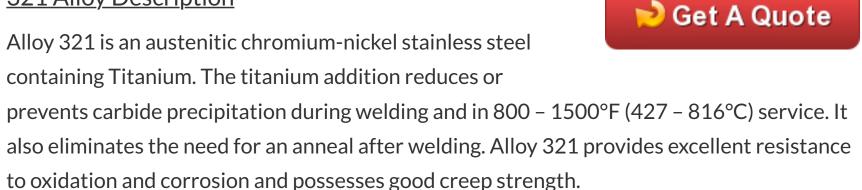


321 Stainless Steel, UNS S32100

Shaped, Flat, Square, Round, Fine, Plated and Bare Wire ASTM A313, ASTM A240, ASTM 479, ASTM 580, AMS 5510, AMS 5645, AMS 5689

321 Alloy Description



Applications

Header bars for heat exchangers
Jet Engine parts
Fasteners

Couplings

Chemistry Typical

Carbon: 0.08 max

Manganese: 2.00 max

Silicon: 0.75 max

Chromium: 17.00-19.00

Nickel: 9.00-12.00

Molybdenum: 0.75 max Phosphorus: 0.045 max

Sulfur: .030 max

Copper: 0.75 max

Nitrogen: .010 max

Titanium: 5x(Carbon + Nitrogen) min-0.70 max

Iron: Balance

Physical Properties

Density: 0.29 lbs/in³, 9.01 g/cm³

Electrical Resistivity: microhm-in (microhm-cm)

68°F (20°C): 28.4 (72)

Specific Heat: BTU/lb/°F (kJ/kg•K)

32-212°F (0-100°C): 0.12 (0.50)

Thermal Conductivity:BTU/hr/ft²/ft/°F (W/m•K)

At 212°F (100°C): 9.3 (16.0)

At 932°F (500°C): 12.8 (22.0)

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

32-212°F (0-100°C): 9.2 x 10⁻⁶(16.6)

32-600°F (0-315°C): 9.5 x 10⁻⁶(17.1)

32-1000°F (0-538°C): 10.3 x 10⁻⁶(18.5)

32-1200°F (0-649°C): 10.7 x 10⁻⁶(19.3)

32-1500°F (0-873°C): 11.2 x 10⁻⁶(20.2)

Modulus of Elasticity: KSI (MPa)

 $28.0 \times 10^3 (193 \times 10^3)$ in tension

 11.2×10^3 (78×10^3) in torsion

Magnetic Permeability: H = 200 Oersteds:

Annealed < 1.02 max.

Melting Range: °F (°C) 2500 - 2550 (1371 - 1400)

Mechanical Properties at Room Temperature

Properties: Annealed

Ultimate Tensile Strength: 75 KSI min (515 MPa min)

Yield Strength (0.2% Offset): 30 KSI min (250 MPa min)

Elongation: 40% min

Hardness: Rb 95 max

Properties Tempered

Alloy 321 can be cold rolled to achieve the temper properties required by specific customers and/or manufacturing requirements. Contact Ulbrich Wire for details.

Additional Properties

Corrosion Resistance

321 has excellent corrosion resistance equivalent to alloys 302 or 304 in the annealed condition and superior if a weldment in these grades has not been post-weld annealed.

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 application.

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 321 can be readily formed and drawn.

Heat Treatment

Alloy 321 is non hardenable by heat treatment. It can only be hardened by cold working.

Stress Relieving

Heat to 1290°F (700°C) for 1 to 2 hours and then air cool.

Welding

Alloy 321 is weldable by common fusion and resistance methods. Use type 347 filler rod or electrodes. For best results refer to: SSINA's "Welding of Stainless Steels and Other Joining Methods".

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