Incoloy® 825 (Alloy 825) UNS N08825

Shaped, Flat, Square, Round, Fine Wire, Plated and Un-plated AMS 5542, ASTM B424, ASTM B425, ASTM B564, ASTM B 906

Alloy 825 Description Wire Description

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Alloy 825 is a nickel-iron-chromium-molybdenum-copper alloy containing high levels of chromium, nickel, copper and molybdenum to provide high levels of corrosion resistance to both moderately oxidizing and moderately reducing environments. Far superior when compared to the standard stainless steels. As an austenitic, nickel-base alloy, the material is ductile over a wide range of temperatures from cryogenic to well in excess of 1000°F (538°C). Fabrication of Alloy 825 is typical of nickel-base alloys, with the material readily formable and weldable by a variety of techniques.

Applications

Components for chemical processing pollution control, oil and gas recovery
Pickling tank parts
Components for processing nuclear fuel

Chemistry Typical

Nickel: 38.00-46.00
Chromium: 19.50-23.50
Iron: 22.00 min
Titanium: 0.06-1.2
Molybdenum: 2.50-3.50

Copper: 1.50-3.00
Carbon: 0.05 max
Manganese: 1.0 max
Sulfur: 0.03 max
Silicon: 0.5 max
Aluminum: 0.2 max

Physical Properties

Density: 0.294 lbs/in^3, 8.14 g/cm^3

Specific Heat, (32-212°F), Btu/lb•°F, (0-100°C), J/kg•°C:
0.105 (440)

Mean Coefficient of Thermal Expansion: in/in/°F (mm/m/°C):
70-212°F (20-100°C):7.7 x 10⁻⁶ (13.9)

Thermal Conductivity: BTU/h-ft-°F (W/m-°K)
At 70°F (21°C): 6.4 (11.1)

Modulus of Elasticity: KSI (MPa)
28.4 x 10^3 (196 x 10^3) in tension

Permeability at 70°F (21°C) H= 200 Oersted:Annealed: 1.005

Melting Range: 2500-2550°F (1370-1400°C)

Mechanical Properties at Room Temperature

Annealed Typical
Ultimate Tensile Strength: 85 KSI min (586 MPa min)
Yield Strength: (0.2% offset) 35 KSI min (241 MPa min)
Elongation: 30% min

Properties Tempered
Alloy 825 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

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

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

Heat Treatment

Alloy 825 cannot be hardened heat treating

Welding

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

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