



Alloy 36, UNS K93600

Fine Wire, Round Wire, Flat Wire, Square Wire, Custom Shaped Wire, Plated Wire and Bare Wire
ASTM F1684

Alloy 36 Description Wire Description



Alloy 36 is a nickel-iron alloy which maintains constant dimensions over the range of normal atmospheric temperatures. The alloy has a low coefficient of thermal expansion from cryogenic temperatures up to 500 °F (260 °C)

Applications

- Standards of length
- Measuring devices
- Laser components
- Bi-metal thermostat strip
- Piping for storing and transporting liquefied gases

Chemistry Typical

- Nickel: 35.00-37.00
- Iron: Balance
- Carbon: 0.10 max
- Silicon: 0.350 max
- Manganese: 0.60 max
- Cobalt: 1.00 max
- Chromium: 0.50 max

Phosphorus: 0.025 max

Sulfur: 0.025 max

Molybdenum: 0.50 max

Copper: 0.50 max

Physical Properties

Density: 0.293 lb/in³, 8.11 g/cm³

Electrical Resistivity: ohm-cir-mil/ft, microhm-cm:

At 68°F (20°C): 481(80)

At 212°F (100°C): 517(89)

At 392°F (200 °C): 583(97)

At 572°F (300°C): 632(105)

At 752°F (400°C): 668(111)

At 932°F (500°C): 704(117)

At 1112°F (600°C): 728(121)

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

At 68°F (20°C): 69.3 (10.0)

Mean Coefficient of Thermal Expansion: $\mu\text{in/in-}^\circ\text{F}$ ($\mu\text{m/m-}^\circ\text{C}$): Annealed

-328-68°F (-200-20°C): 0.8 (1.5)

-148-68°F (-100-20°C): 0.7 (1.3)

68-212°F (20-100°C): 0.8 (1.5)

68-302°F (20-150°C): 1.1 (2.0)

68-392°F (20-200°C): 1.4 (2.6)

68-482°F (20-250°C): 1.9 (3.5)

68-572°F (20-300°C): 3.1 (5.5)

68-662°F (20-350°C): 4.0 (7.2)

68-752°F (20-400°C): 4.7 (8.4)

68-842°F (20-450°C): 5.2 (9.3)

68-932°F (20-500°C): 5.6 (10.1)

Modulus of Elasticity: KSI (MPa)

20.3 x 10³ (140 x 10³) in tension

Melting Range: 2605°F (1430°C)

Mechanical Properties at Room Temperature

Properties: Annealed Typical

Ultimate Tensile Strength: 71 KSI nom (490 MPa nom)

Yield Strength: 35 KSI nom (241 MPa nom)

Elongation: 42% nom

Properties: Tempered

Alloy 36 can be cold worked to various tempers. Contact Ulbrich Technical Service for additional information

Additional Properties

Corrosion Resistance

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

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

* Consult Ulbrich Wire with Special Finish requests.

Heat Treatment

Alloy 36 is non hardenable by heat treatment.

Welding

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

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