Alloy 46, UNS K94600

Shaped, Flat, Square, Round, Fine Wire, Plated and Un-plated Specifications: ASTM F-30

Alloy 46 Wire Description

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Containing 46% nickel this alloy considered a controlled expansion alloy. It has a fairly constant coefficient of thermal expansion from room temperature up to 932°F (500°C).

Applications

Glass and ceramic to metal seals

Electrical resistors

Chemistry Typical

Carbon: 0.05 max

Silicon: 0.30 max

Manganese: 0.80 max

Nickel: 46 nom

Chromium: 0.25 nom

Iron: Balance

Phosphorus: 0.025 max

Sulfur: 0.025 max

Aluminum: 0.10 max

Physical Properties

Density: 0.295 lb/in^3, 8.2 g/cm^3

Electrical Resistivity: ohm-cir-mil/ft, microhm-cm:
At 68°F (20°C): 277(47)

Thermal Conductivity: BTU-in/hr-ft2-°F (W/m•K):
77-212°F (25-100°C): 79.2(11)

Mean Coefficient of Thermal Expansion: µin/in-°F (µm/m-°C):
Contact Ulbrich Wire for information

Melting Point: 2600°F (1430°C)

Mechanical Properties at Room Temperature

Properties: Annealed Typical
Ultimate Tensile Strength: 74 KSI nom (510 MPa nom)
Yield Strength: 36 KSI nom (247 MPa nom)
Elongation: 30% nom
Hardness: Rb73 nom

Properties Tempered
Alloy 46 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.

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 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

HeatTreatment
Alloy 46 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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