



Alloy 42 Wire, UNS N94100

Shaped, Flat, Square, Round, Fine Wire, Plated and Bare Wire

ASTM F-30

Alloy 42 Alloy Description

Alloy 42 is a nickel-iron alloy that has a relatively constant coefficient of thermal expansion up to 570°F (300°C). This alloy is easily coined

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Applications

Electronic cans and covers in metal to glass sealing applications

Semiconductor lead frames

Thermostat bi-metal strips

Micro-electronic components

Chemistry: Typical

Nickel: 41.00 nominal*

Iron: Balance

Carbon: 0.05 max

Silicon: 0.30 max

Manganese: 0.60 max

Chromium: 0.50 max

Phosphorus: 0.025 max

Sulfur: 0.025 max

Aluminum: 0.10 max

* The nickel listed may be adjusted so that the alloy meets the specified requirements for coefficient of thermal expansion

Physical Properties

Density: 0.291lb/in³, 8.11 g/cm³

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

At 68°F (20°C): 367(61)

At 212°F (100°C): 421(70)

At 392°F (200 °C): 523(87)

At 572°F (300°C): 608(101)

At 752°F (400°C): 662(110)

At 932°F (500°C): 698(116)

At 1112°F (600°C): 722(120)

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

At 68°F (20°C): 72.8 (10.5)

Mean Coefficient of Thermal Expansion: μin/in-°F (μm/m-°C): Anneale

68-572°F (20-300°C): 2.9 (5.3)

68-662°F (20-350°C): 3.0 (5.4)

68-752°F (20-400°C): 3.4 (6.2)

68-842°F (20-450°C): 3.9 (7.1)

68-932°F (20-500°C): 4.4 (8.0)

Modulus of Elasticity: KSI (MPa)

21.8 x 10³ (150 x 10³) in tension

Melting Point: 2615°F (1435°C)

Mechanical Properties at Room Temperature

Properties: Annealed Typical

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

Yield Strength: 36 KSI nom (248 MPa nom)

Elongation: 43% nom

Properties Tempered

Alloy 42 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

Heat Treatment

Alloy 42 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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