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ALLOY 80/20 NICKEL/CHROMIUM, UNS N06003

Strip, Coil, Foil & Wire

Applications

Electrical heating elements for industrial devices such as flat irons, water heaters, plastic moulding dies, soldering irons

Description

This alloy can be used at operating temperatures up to 1200 °C, (2190 °F). Its chemical composition gives good oxidation resistance especially under conditions of frequent switching or wide temperature fluctuations.

Chemistry Typical

Nickel: 80%

Chromium: 20%

Physical Properties

Density: 0.303 lb/in³, 8.31 g/cm³

Electrical Resistivity: ohm-cir-mil/ft (ohm-mm²/mm):

At 68 °F (20 °C): 650 (1.08)

At 212 °F (100 °C): 656 (1.09)

At 392 °F (200 °C): 662 (1.10)

At 572 °F (300 °C): 668 (1.11)

At 752 °F (400 °C): 680 (1.13)

At 1290 °F (700 °C): 686 (1.14)

At 1470 °F (800 °C): 686 (1.14)

At 1650 °F (900 °C): 686 (1.14)

At 1830 °F (1000 °C): 692 (1.15)

At 2010 °F (1100 °C): 699 (1.16)

At 2190 °F (1200 °C): 704 (1.17)

Specific Heat: BTU/lb-°F (J/g-°C):

At 68 °F (20 °C): 0.107 (0.448)

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Thermal Conductivity: BTU-in/hr-ft²-°F (W/m•K):
133 (19.2)

Mean Coefficient of Thermal Expansion: $\mu\text{in/in-}^\circ\text{F}$ ($\mu\text{m/m-}^\circ\text{C}$):
At 68 - 212 °F (20 - 100 °C): 6.94 (12.5)

Melting Temperature: 2550 °F (1400 °C)

Forms

Coil - Sheet, Strip, Foil

Wire - Profile, Round, Flat, Square

Mechanical Properties at Room Temperature

Properties: Annealed Typical

Ultimate Tensile Strength: 95000 KSI (655 MPa)

Properties: Tempered

Alloy 80/20 can be cold worked to various tempers. Contact Ulbrich Technical Service for additional information.

Additional Properties

Corrosion Resistance

Refer to NACE (National Associate of Corrosion Engineers) for recommendations.

Finishes

#1 – Hot rolled annealed and descaled. It is available in strip, foil and ribbon. It is used for applications where a smooth decorative finish is not required.

#2D – Dull finish produced by cold rolling, annealing and descaling. Used for deep drawn parts and those parts that need to retain lubricants in the forming process.

#2B – Smooth finish produced by cold rolling, annealing and descaling. A light cold rolling pass is added after anneal with polished rolls giving it a brighter finish than 2D.

#BA – Bright annealed cold rolled and bright annealed

#CBA – Course bright annealed cold rolled matte finish and bright anneal

#2 – Cold Rolled

#2BA – Smooth finish produced by cold rolling and bright annealing. A light pass using highly polished rolls produces a glossy finish. A 2BA finish may be used for lightly formed applications where a glossy finish is desired in the formed part.

Polished – Various grit finish for specific polish finished requirements.

** Not All Finishes are Available for All Alloys – Consult Sales for Applicable Finishes.*

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Wire Finishes

XC – Extra Clean Bright Annealed or Bright Annealed and Cold Rolled

Grease – Ultra bright finish (for decorative applications)

Soap – Soap coating on tempered wire to act as lubricant

* *Contact Ulbrich Wire with special wire finishes.*

Heat Treatment

Alloy 80/20 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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