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HASTELLOY® G-3, UNS N06985

(Alloy G-3) Strip, Coil, Foil & Wire, ASTM 582, ASTM B 581

Applications

Hastelloy® G-3 is used in handling equipment that processes reducing acids such as phosphoric and sulfuric. Other applications are scrubbers, sour gas and oil production equipment.

Description

Hastelloy® G-3 is nickel-chromium-iron alloy with addition of molybdenum and copper. The alloy has excellent corrosion resistance to oxidizing chemicals and atmospheres while offering resistance to reducing chemical resulting from the nickel and copper content.

Chemistry Typical

Nickel: Balance
Chromium: 21.00-23.5
Iron: 18.00-21.00
Molybdenum: 6.0-8.0
Copper: 1.5-2.5
Cobalt: 5.0 max
Columbium + Tantalum: 0.50 max
Carbon: 0.015 max
Tungsten: 1.5 max
Silicon: 1.0 max
Phosphorus: 0.04 max
Sulfur: 0.03 max

Physical Properties

Density: 0.294 lb/in³, 8.14 g/cm³

Electrical Resistivity: ohm-cir-mil/ft, (micro-ohms-cm):
675.97(112.37)

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Specific Heat: BTU/lb-°F (J/Kg-°C)

At 77 °F (25 °C): 0.108 (453)

At 212 °F (100 °C): 0.111 (464)

At 392 °F (200 °C): 0.114 (478)

At 572 °F (300 °C): 0.118 (493)

At 752 °F (400 °C): 0.121 (507)

At 932 °F (500 °C): 0.124 (521)

At 1112 °F (600 °C): 0.130 (543)

Thermal Conductivity: BTU-in/hr-ft²-°F, (W/m-°C)

At 77 °F (25 °C): 69 (10.0)

At 212 °F (100 °C): 82 (11.8)

At 392 °F (200 °C): 96 (13.8)

At 572 °F (300 °C): 110 (15.9)

At 752 °F (400 °C): 124 (17.9)

At 932 °F (500 °C): 139 (20.0)

At 1112 °F (600 °C): 151 (21.8)

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

75 – 212 °F (24 – 100 °C): 8.1 (14.6)

75 – 392 °F (24 – 200 °C): 8.1 (14.6)

75 – 572 °F (24 – 300 °C): 8.1 (14.6)

75 – 752 °F (24 – 400 °C): 8.2 (14.8)

75 – 932 °F (24 – 500 °C): 8.4 (15.1)

75 – 1112 °F (24 – 600 °C): 8.4 (15.1)

Modulus of Elasticity: ksi (MPa)

28.9×10^3 (199×10^3) in tension

Melting Range: 2300 - 2450 °F (1260 - 1343 °C)

Forms

Coil – Sheet, Strip, Foil

Wire – Profile, Round, Flat, Square

Mechanical Properties at Room Temperature

Properties: Annealed Typical

Ultimate Tensile Strength: 90 KSI min (621 MPa min)

Yield Strength: 35 KSI min (241 MPa min)

Elongation: 45% min

Hardness: aim Rb 100 max

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Properties: Tempered

Hastelloy® G-3 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.*

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 finish requests.*

Heat Treatment

Hastelloy® G-3 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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