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Ulbrich Stainless Steels & Special Metals, Inc. • 153 Washington Avenue • North Haven, CT 06473 USA • 800-243-1676 • ULBRICH.com

PERMANICKEL 300®, UNS N03300

Strip, Coil, Foil, Wire, ASTM F290

Applications

Used typically for electrical contact applications such as springs.

Description

Permanickel 300® is an age-hardenable high Nickel super alloy with a maximum carbon level of 0.4% and Magnesium and Titanium additions. This alloy provides high thermal and electrical conductivity. It can be hardened by cold working and aging. The combination of cold working and aging will produce the higher ultimate tensile strength.

Chemistry Typical

Nickel + Cobalt: 97 min

Carbon: 0.40 max

Silicon: 0.35 max

Manganese: 0.50 max

Magnesium: 0.2-0.5

Titanium: 0.2-0.6

Sulfur: 0.010 max

Iron: 0.6 max

Copper: 0.25 max

Physical Properties

Density: 0.316 lbs/in³, 8.74 g/cm³

Thermal Conductivity, BTU/hr/ft²/ft/°F (W/m•K):

212 °F (100 °C) - 400 (16.2)

Mean Coefficient of Thermal Expansion, in/in/°F (µm/m•K):

32 - 212 °F - 6.8×10^{-6} (16.5)

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Modulus of Elasticity, ksi (MPa) in Tension

30.0 x 10³ (207 x 10³)

Melting Point: 2600 °F (1427 °C)

Forms

Coil – Strip, Foil, Ribbon

Wire – Profile, Round, Flat, Square

Mechanical Properties at Room Temperature

Properties: Annealed

Ultimate Tensile Strength: 90 – 120 KSI

Yield Strength (0.2% offset): 35 – 60 KSI

Elongation: 25-50%

Hardness: Rb 90 max

Properties: Tempered

Permanickel 300® can be cold rolled to various tempers. Contact Ulbrich Technical Service for additional information.

Annealed & Aged

Ultimate Tensile Strength: 150 – 190 KSI

Elongation: 10-20%

Hardness: Rc 30-40

Half Hard

Ultimate Tensile Strength: 130 – 155 KSI

Elongation: 3-15%

Hardness: Rc 25-34

Half Hard & Aged

Ultimate Tensile Strength: 170 – 210 KSI

Elongation: 1-20%

Hardness: Rc 33-42

Spring Temper

Ultimate Tensile Strength: 150 – 190 KSI

Elongation: 2-10%

Hardness: Rc 30-40

Spring Temper & Aged

Ultimate Tensile Strength: 180 – 230 KSI

Elongation: 5-15%

Hardness: Rc 36-46

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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 in all alloys – Contact Sales for more information.*

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 Sales for custom wire finishes.*

Cold Forming

Permanickel 300® can be easily formed by conventional method.

Heat Treatment

Permanickel 300® can be hardened by cold working and by heat treating.

Welding

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

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