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

NICKEL 200, UNS N02200

Strip, Coil, Foil, Wire, ASTM B162

Applications

Lead wires, battery components, transducers, sparking electrodes, and heat exchangers

Description

Alloy 200 is a wrought commercially pure Nickel with a maximum carbon level of 0.15%. This alloy provides highly ductile mechanical properties across a wide temperature range. It provides corrosion resistance in neutral to moderately reducing environments. Nickel 200 is ferromagnetic. It provides high thermal and electrical conductivity in comparison to nickel-base alloys, stainless and low alloy steels. Nickel 200 is not recommended for service above 600 °F (316 °C) because long-time exposures in the 800 °F to 1200 °F range result in precipitation of a carbon containing phase and loss of ductility.

Chemistry Typical

Nickel + Cobalt: 99.00 min
Carbon: 0.15 max
Manganese: 0.35 max
Silicon: 0.35 max
Sulfur: 0.010 max
Iron: 0. 40 max
Copper: 0.25 max

Physical Properties

Density: 0.321 lbs/in³, 8.89 g/cm³

Specific Heat: BTU/lb/°F (J/kg•K):
32 - 212 °F (0 - 100 °C): 0.12 (456)

Thermal Conductivity, BTU/hr/ft²/ft/°F (W/m•K)
At 212 ºF (100 ºC): 38.8 (67.1)
At 400 °F (204 °C): 35.4 (61.3)
At 600 ºF (316 ºC): 36.5 (56.3)

Mean Coefficient of Thermal Expansion: in/in/°F (µm/m•K)
80 - 200 °F (27 - 93 °C): 7.4 x 10^{-6} (13.3)
80 - 400 °F (27 - 204 °C): 7.7x 10^{-6} (13.9)
80 - 600 °F (27 - 316 °C): 8.0x 10^{-6} (14.4)

Modulus of Elasticity, ksi (MPa)
30.0 x 10^3 (207 x 10^3)

Melting Range: 2615 - 2535 °F (1435 - 1445 °C)

Forms

Coil – Strip, Foil, Ribbon
Wire – Profile, Round, Flat, Square

Mechanical Properties at Room Temperature

Properties: Annealed

Ultimate Tensile Strength: 55 KSI min (380 MPa min)
Yield Strength (0.2% offset): 15 KSI min (100 MPa min)
Elongation:
35% min: gauges ≤ 0.0035 inches
40% min: gauges > 0.0035 inches
Hardness:
HV 117 max: gauges ≤ 0.010 inches
Rb 66 max: gauges > 0.010 inches

Properties: Tempered

Nickel 200 can be cold rolled 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 wire finishes.*

Heat Treatment

Nickel 200 is non hardenable by heat treatment.

Welding

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