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

NICKEL 201, UNS N02201

Strip, Coil, Foil, Wire, ASTM B162

Applications

Used primarly for parts requiring excellent corrosion and strong magnetic properties such as: Lead wires, battery components, transducers, sparking electrodes, and heat exchangers

Description

Alloy 201 ia a wrought commercially pure Nickel with a maximum carbon level of 0.02%. This alloy provides highly ductile mechanical properties across a wide temperature range.It provides corrosion resistance in neutral to moderately reducing environments. Nickel 201 is ferromagnetic. It provides high thermal and electrical conductivity in comparison to nickel-base alloys, stainless and low alloy steels. Because of its low carbon content (.02% max.) Nickel 201 may be considered for service above 600 °F (316 °C), where alloy 200 with higher carbon content is not recommended.

Chemistry Typical

Nickel + Cobalt: 99.99 min
Carbon: 0.02 max
Manganese: 0.35 max
Silicon: 0.35 max
Sulfur: 0.010 max
Iron: 0.40 max
Copper: 0.25 max

Physical Properties

Density: 0.322 lbs/in³, 8.90 g/cm³

Thermal Conductivity, BTU/hr/ft²/ft/°F(W/m•K)
212 ºF (100 ºC) – 38.8 (67.1)
400 °F (204 °C) – 35.4 (61.3)
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: 50 KSI min (345 MPa min)
Yield Strength (0.2% offset): 12 KSI min (83 MPa min)
Elongation:
30% min: gauges < 0.050 inches
35% min: gauges ≥ 0.050 inches
Hardness:
HV 117 max: gauges ≤ 0.010 inches
Rb 66 max: gauges > 0.010 inches

Properties: Tempered

Nickel 201 can be cold rolled to various tempers. Contact Ulbrich Technical Service for additional information.

Additional Properties

Corrosion Resistance

Nickel 201 is used principally in reducing or neutral environments. It may also be used in oxidizing environments that cause the formation of a passive film. The nickel content of this alloy renders it virtually immune to chloride stress corrosion cracking. It can also be used in fresh and many other process waters. Sulfurous atmospheres are corrosive to Nickel alloys.
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 – Contact Ulbrich 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 Ulbrich Wire for custom finishes.*

Heat Treatment

Nickel 201 is non hardenable by heat treatment.

Welding

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