INCONEL® 601, UNS N06601

(Nickel 601) Strip, Coil, Foil & Wire, AMS 5715, AMS 5870, ASTM B166, ASTM B167, ASTM B168

Applications

Furnace components such as baskets, muffles, retorts, petrochemical processing equipment, gas turbine components

Description

Inconel® 601 (alloy 601) is a nickel-chromium alloy with an aluminum addition for good resistance to oxidation and other forms of high temperature resistance. The alloy has good mechanical properties at elevated temperatures.

Chemistry Typical

Nickel: 58.00-63.00
Chromium: 21.00-25.00
Iron: Balance
Aluminum: 1.0-1.70
Carbon: 0.10 max
Manganese: 1.00 max
Sulfur: 0.015 max
Silicon: 0.50 max
Copper: 1.00 max

Physical Properties

Density: 0.293 lb/in³, 8.11 g/cm³

Electrical Resistivity: ohm-cir-mil/ft, (micro-ohms-m):
At 70 °F (20 °C): 710 (1.180)

Specific Heat: BTU/lb-°F (J/kg-°C):
At 70 °F (20 °C): 0.107 (448)

Thermal Conductivity: BTU-in/hr-ft²-°F (W/m•K)
70 °F (20 °C): 78 (11.2)

Mean Coefficient of Thermal Expansion: 10^{-6} in/in-°F (µm/m-°C)
80 - 200 °F (27 - 100 °C): 7.60 (13.75)
80 - 400 °F (27 - 200 °C): 8.01 (14.36)
80 - 600 °F (27 - 300 °C): 8.11 (14.58)
80 - 800 °F (27 - 400 °C): 8.30 (14.83)
80 - 1000 °F (27 - 500 °C): 8.50 (15.19)
80 - 1200 °F (27 - 600 °C): 8.87 (15.62)
80 - 1400 °F (27 - 700 °C): 9.19 (16.11)
80 - 1600 °F (27 - 800 °C): 9.51 (16.67)
80 - 1800 °F (27 - 900 °C): 9.82 (17.24)
80 - 2000 °F (27 - 1000 °C): 10.18 (17.82)

Modulus of Elasticity: KDSI (MPa)
29.95 x 10³ (20.65 x 10³) in tension

Melting Range: 2480 - 2571 °F (1360 - 1411 °C)

Forms

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

Mechanical Properties at Room Temperature

Properties: Annealed Typical

Ultimate Tensile Strength: 80 KSI min (552 MPa min)
Yield Strength: 30 KSI min (207 MPa min)
Elongation: 35% min

Properties: Tempered

Inconel® 601 (alloy 601) 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.

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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 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

Inconel® 601 (alloy 601) is non hardenable by heat treatment.

Welding

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