



# Inconel® 617, UNS N06617

Shaped, Flat, Square, Round, Fine Wire, Plated and Bare Wire  
AMS 5887, AMS 5888, AMS 5889, ASTM B166

## Alloy 617 Description

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Alloy 617 is a nickel-chromium-cobalt-molybdenum alloy. With an exceptional combination of metallurgical stability, strength, oxidation resistance at high temperatures and resistance to oxidation is enhanced by an aluminum addition, the alloy also resists a wide range of corrosive aqueous environments. Used in gas turbines for combustion cans, ducting, and transition liners; for petrochemical processing; for heat-treating equipment; and in nitric acid production. Standard product forms are round, forging stock, extruded section, plate, sheet, strip, pipe, tube, and wire.

## Applications

Gas turbines for combustion components  
Petrochemical processing  
Heat-treating equipment  
In nitric acid production

## Chemistry Typical

Nickel: 44.5 min  
Chromium: 20.0-24.0  
Cobalt: 10.0-15.0  
Molybdenum: 8.0-10.0  
Aluminum: 0.8-1.5

Carbon: 0.05-0.15

Iron: 3.0 max.

Manganese: 1.0 max.

Silicon: 1.0 max.

Sulfur: 0.015 max.

Titanium: 0.6 max.

Copper: 0.5 max.

Boron: 0.006 max

## **Physical Properties**

Density: 0.302 lb/in<sup>3</sup>, 8.36 g/cm<sup>3</sup>

Electrical Resistivity: ohm-cir-mil/ft (micro-ohm-m):

At 78°F (20°C): 736(1.222)

At 200°F (100°C): 448(1.245)

At 400°F (200°C): 757(1.258)

At 600°F (300°C): 764(1.268)

At 800°F (400°C): 770(1.278)

At 1000°F (500°C): 779(1.290)

At 1200°F (600°C): 793(1.308)

At 1400°F (700°C): 807(1.332)

At 1600°F (800°C): 803(1.342)

At 1800°F (900°C): 824(1.338)

At 2000°F (1000°C): —(1.378)

Specific Heat: BTU/lb-°F (J/Kg-°C):

At 78°F (20°C): 0.100(419)

Thermal Conductivity: BTU-in/hr-ft<sup>2</sup>-°F (W/m•°C):

At 78°F (20°C): 94(13.4)

At 200°F (100°C): 101(14.7)

At 400°F (200°C): 113(16.3)

At 600°F (300°C): 125(17.7)

At 800°F (400°C): 137(19.3)

At 1000°F (500°C): 149(20.9)

At 1200°F (600°C): 161(22.5)

At 1400°F (700°C): 173(23.9)

At 1600°F (800°C): 185(25.5)

At 1800°F (900°C): 197(27.1)

At 2000°F (1000°C): 209(28.7)

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

78-200°F (20-100°C): 7.0 (11.6)

78-400°F (20-200°C): 7.2 (12.6)

78-600°F (20-300°C): 7.49 (13.1)

78-800°F (20-400°C): 7.6 (13.6)

78-1000°F (20-500°C): 7.7 (13.9)

78-1200°F (20-600°C): 8.0 (14.0)

78-1400°F (20-700°C): 8.4 (14.8)

78-1600°F (20-800°C): 8.7 (15.4)

78-1800°F (20-900°C): 9.0 (15.8)

78-2000°F (20-1000°C): 9.2 (16.3)

Modulus of Elasticity: KSI (MPa)

$30.6 \times 10^3$  ( $211 \times 10^3$ ) in tension

Melting Range: 2430-2510°F (1332-1380°C):

## **Mechanical Properties at Room Temperature**

### **Properties: Annealed Typical**

Ultimate Tensile Strength: 95 KSI min (655MPa min)

Yield Strength: 35 KSI min (241 MPa min )

Elongation: 30% min

### **Properties: Tempered**

Alloy 617 can be cold rolled to achieve the temper properties required by specific customers and/or manufacturing requirements. Contact Ulbrich Wire for details.

## **Additional Properties**

## Corrosion Resistance

Refer to NACE (National Association of Corrosion Engineers) for recommendations.

## Standard Wire Finishes

**Extra Clean:** Extra clean is also referred to as “bright annealed” or “bright annealed and cold rolled”

**Grease (round wire only):** Drawn in a heavy grease produces an “Ultra bright” finish for decorative applications

**Soap (round wire only):** Soap is used as a lubricant in the drawing process and is not removed. It acts as a lubricant during customer part forming operation. A soap finish is available in tempered products.

**Plated:** Many plating options are available.

\*Special finishes are available: Contact Ulbrich Wire Sales with special finish and plating requests.

## Forms

Continuous Coils

Cut to lengths

Precision cutting

## Heat Treatment

Alloy 617 is non hardenable by heat treatment.

## Welding

For best results refer to: SSINA’s “Welding of Stainless Steels and Other Joining Methods”.

\* Inconel® 617 is a registered trademark of the Special Metals Corp.

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