



# Hastelloy® C4 (Alloy C-4), UNS N06455 Wire

Forms: Shaped, Flat, Square, Round, Fine Wire, Plated and Bare Wire

Specifications: ASTM B 575

## Hastelloy® C4 Description

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Alloy C-4 is a nickel-chromium-molybdenum alloy with outstanding high temperature stability. This alloy resists the formation of grain-boundary precipitates in the weld heat-affected zone, thus making it suitable for most chemical process applications in the as-welded condition. Alloy C-4 alloy also has excellent resistance to stress-corrosion cracking and to oxidizing atmospheres up to 1900°F (1038°C).

## Applications

Components used in wastewater treatment

Components used in chemical processing

Nuclear fuel processing

## Chemistry Typical

Nickel: Balance

Chromium: 14.00-18.00

Molybdenum: 14.00-17.00

Iron: 3.00 max

Cobalt: 2.00 max

Manganese: 1.00 max

Carbon: 0.015 max

Silicon: 0.08 max

Phosphorus: 0.04 max

Sulfur: 0.03 max

Titanium: 0.70 max

## **Physical Properties**

Density: 0.312 lb/in<sup>3</sup>, 8.64 g/cm<sup>3</sup>

Electrical Resistivity: micro-ohm-in, (micro-ohm-m):

At 74°F (23°C): 49.1(1.25)

At 212°F (100°C): 49.3 (1.25)

At 392°F (200°C): 49.6 (1.26)

At 572°F (300°C): 49.9 (1.27)

At 752°F (400°C): 50.2 (1.28)

At 932°F (500°C): 50.8 (1.29)

At 1112°F (600°C): 51.8 (1.32)

Specific Heat: BTU/lb-°F (J/Kg-K)

At 32°F (0°C): 97 (406)

At 212°F (100°C): 102 (427)

At 392°F (200°C): 107 (448)

At 572°F (300°C): 111 (465)

At 752°F (400°C): 114 (477)

At 932°F (400°C): 117 (490)

At 1112°F (500°C): 120 (502)

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

At 74°F (23°C):70(10.1)

At 212°F (100°C):79 (11.4)

At 392°F (200°C):92 (13.2)

At 572°F (300°C):104 (15.0)

At 752°F (400°C):116 (16.7)

At 932°F (500°C):128 (18.4)

At 1112°F (600°C):142 (20.5)

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

68-200°F (20-93°C): 6.0 ( $10.8 \times 10^{-6}$ )

68-400°F (20-204°C): 6.6 ( $11.9 \times 10^{-6}$ )

68-600°F (20-316°C): 7.0 ( $12.6 \times 10^{-6}$ )

68-800°F (20-427°C): 7.2 ( $13.0 \times 10^{-6}$ )

68-1000°F (20-538°C): 7.4 ( $13.3 \times 10^{-6}$ )

68-1200°F (20-649°C): 7.5 ( $13.5 \times 10^{-6}$ )

68-1400°F (20-760°C): 8.0 ( $14.4 \times 10^{-6}$ )

68-1600°F (20-871°C): 8.3 ( $14.9 \times 10^{-6}$ )

68-1800°F (20-982°C): 8.7 ( $15.7 \times 10^{-6}$ )

Modulus of Elasticity: KSI (MPa)

$30.8 \times 10^3$  ( $211 \times 10^3$ ) in tension

Melting Point: 2550°F (1399°C):

## **Mechanical Properties at Room Temperature**

### **Properties: Annealed Typical**

Ultimate Tensile Strength: 100 KSI min (690 MPa min)

Yield Strength: 40 KSI min (276 MPa min)

Elongation: 40% min

Hardness: Rb 100 max (aim)

### **Properties: Tempered**

Alloy C-4 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.

### **Heat Treatment**

Alloy C-4 is non-hardenable by heat treatment.

## **Welding**

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

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