



ULTIMET®, UNS R31233

Shaped, Flat, Square, Round, Fine Wire, Plated and Un-plated Strip, Foil, Wire, ASTM B-815, ASTM B-818

ULTIMET® Wire Description

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ULTIMET® is a cobalt-based alloy with excellent resistance to galling, cavitation erosion, slurry erosion, liquid droplet impact. Ideal welding material with exceptional ductility and resistance to weld cracking, very easy to apply as an overlay, multiple layers applicable with little to no preheat.

Applications

Seals
Valve parts
Dies
Rolls
Bolts and screws

Chemistry Typical

Cobalt: Balance
Chromium: 26 nominal
Nickel: 9 nominal
Molybdenum: 5 nominal
Tungsten: 2 nominal
Manganese: 0.8 nominal
Silicon: 0.3 nominal
Nitrogen: 0.08 nominal

Carbon: 0.06 nominal

Physical Properties

Density: 0.306 lb/in³, 8.47 g/cm³

Electrical Resistivity: $\mu\text{ohm-in}$ ($\mu\text{ohm-m}$)

At 73°F (23°C): 34.2 (0.87)

At 212°F (100°C): 35.4 (0.89)

At 392°F (200°C): 36.6 (0.93)

At 572°F (300°C): 38.1 (0.96)

At 752°F (400°C): 39.3 (1.00)

At 932°F (500°C): 40.5 (1.03)

At 1112°F (600°C): 41.3 (1.05)

Specific Heat: BTU/lb-°F (J/Kg-K):

At 73°F (23°C): 0.109 (456)

At 212°F (100°C): 0.112 (470)

At 392°F (200°C): 0.115 (482)

At 572°F (300°C): 0.121 (504)

At 752°F (400°C): 0.126 (525)

At 932°F (500°C): 0.130 (545)

At 1112°F (600°C): 0.137 (573)

Thermal Conductivity: BTU-in/hr-ft²-°F (W/m•K)

At 73°F (23°C): 85 (12.3)

At 212°F (100°C): 96 (13.8)

At 392°F (200°C): 108 (15.6)

At 572°F (300°C): 121 (17.5)

At 752°F (400°C): 134 (19.4)

At 932°F (500°C): 149 (21.5)

At 1112°F (600°C): 166 (23.9)

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

78-200°F (26-93°C): 7.2 (13.0×10^{-6})

78-400°F (26-204°C): 7.5 (13.5×10^{-6})

78-600°F (26-316°C): 7.8 (14.0 x 10⁻⁶)

78-800°F (26-427°C): 8.0 (14.5 x 10⁻⁶)

78-1000°F (26-538°C): 8.2 (14.8 x 10⁻⁶)

78-1200°F (26-649°C): 8.4 (15.1 x 10⁻⁶)

78-1400°F (26-760°C): 8.8 (15.9 x 10⁻⁶)

78-1600°F (26-871°C): 9.1 (16.4 x 10⁻⁶)

78-1800°F (26-982°C): 9.4 (16.9 x 10⁻⁶)

Modulus of Elasticity: KSI (MPa)

31.2 x 10³ (215 x 10³) in tension

Melting Range: 2430-2470°F (1332-1354°C)

Properties: Annealed Typical

Ultimate Tensile Strength: 138 KSI min (951 MPa min)

Yield Strength: 72 KSI min (496 MPa min)

Elongation: 42% min

Properties: Tempered

ULTIMET® 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: (XC) 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

ULTIMET® is hardenable by cold working. Inquire with Ulbrich Technical Service for heat treat responses.

Welding

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

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