



Titanium Beta 21S (Grade 21), UNS R58210

Shaped, Flat, Square, Round, Fine Wire, Plated and Un-plated
ASTM B265

Titanium Beta 21S Wire Description

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With high strength Titanium Beta 21 S is a heat treatable, metastable titanium alloy developed as an oxidation-resistant, aerospace material and as a matrix for metal-matrix composites. Beta 21S offers the good formability and weldability of a beta alloy, but with greatly improved oxidation resistance and creep strength.

Applications

Components where resistance to aircraft hydraulic fluids is required

Fasteners

Metal matrix composites

Chemistry Typical

Titanium: Balance

Molybdenum: 14.0-16.0

Niobium: 2.4-3.2

Aluminum: 2.5-3.5

Silicon: 0.15-0.25

Iron: 0.40 max

Oxygen: 0.11-0.17

Carbon: 0.05 max

Nitrogen: 0.05 max

Hydrogen: 0.015 max

Residuals each 0.10 max, total 0.40 max

Physical Properties

Density: 0.178 lbs/in³, 4.94 g/cm³

Mean Coefficient of Thermal Expansion: in/in/°F (mm/m/°C):

70-212°F (20-100°C): 3.93×10^{-6} (7.07)

Thermal Conductivity: BTU-in/h-ft-°F (W/m-°K):

At 70°F

(21°C): 52.7 (7.6)

Modulus of Elasticity: KSI (MPa)

$10.5-12 \times 10^3$ ($72-85 \times 10^3$) in tension

Melting Point: 3034°F (1668°C)

Mechanical Properties at Room Temperature

Properties: Annealed (1550°F)

Ultimate Tensile Strength: 155 KSI min (1068 MPa min)

Yield Strength (0.2% offset): 110 KSI min (758 MPa min)

Elongation: 12%

Aged Properties: Typical

Aging Temp/Time: 1000°F / 8 HOURS

Ultimate Tensile Strength: 170 KSI min (1172 MPa min)

Yield Strength (0.2% offset): 160 KSI min (1103 MPa min)

Elongation: 4%

Aging Temp/Time: 1100°F / 8 HOURS

Ultimate Tensile Strength: 150 KSI min (1034 MPa min)

Yield Strength (0.2% offset): 140 KSI min (965 MPa min)

Elongation: 6%

Aging Temp/Time: 1275°F / 8 HOURS

Ultimate Tensile Strength: 125 KSI min (862 MPa min)

Yield Strength (0.2% offset): 115 KSI min (793 MPa min)

Elongation: 10%

Properties Tempered

Titanium Beta 21S 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.

Finishes

Inquire with Ulbrich Wire

Heat Treatment

Titanium Beta 21S can be hardened by aging

Welding

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

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