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TITANIUM GRADE 3, UNS R50550

(Commercially Pure Titanium: Grade 3) Strip, Coil, Foil, Wire, ASTM B265 GR3, AMS 4900K, ASTM F67, MIL-T-9046CP2

Applications

Bellows, aircraft structural, honeycomb, gaskets, aircraft skin, heat exchanger parts

Description

Commercially Pure Titanium Grade 3 offers slightly higher mechanical properties than Grade 2, while displaying similar ductility and formability. Generally used where corrosion resistance is a major design factor in chemical production components, marine and airframe applications. It can be used for parts requiring strength up to 400 °F and oxidation resistance to 600 °F.

Chemistry Typical

Titanium: Balance
Iron: 0.30 max
Oxygen: 0.35 max
Carbon: 0.80 max
Nitrogen: 0.05 max
Hydrogen: 0.015 max
Residuals each 0.10 max, total 0.40 max

Physical Properties

Density: 0.163 lbs/in³ (4.51 g/cm³)

Mean Coefficient of Thermal Expansion, in/in/°F (mm/m/°C):
70 - 212 °F (20 - 100 °C) 4.78 x 10^{-6} (8.6)

Thermal Conductivity: BTU-in/h-ft-°F (W/m-°K):
At 70 °F (21 °C): 138 (19.9)

Modulus of Elasticity, ksi (MPa)
15.2 x 10³ (105 x 10³) in tension

Melting Point: 3020 °F (1660 °C)

For Reference Only

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Forms

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

Mechanical Properties at Room Temperature

Properties Annealed:

Ultimate Tensile Strength: 65 KSI min (448 MPa min)
Yield Strength: (0.2 Offset) 55 - 80 KSI (379 - 552 MPa)
Elongation: 18% min

Properties: Tempered

Titanium Grade 3 can be cold rolled to various tempers. Contact Ulbrich Technical Service for additional information.

Additional Properties

Corrosion Resistance

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

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 Ulbrich Sales for more information.*

Wire Finishes

XC – Extra clean. Bright annealed or bright annealed and cold rolled
Grease – Ultra bright finish for decorative applications
Soap – Soap is not removed from tempered wire to act as a lubricant.
** Contact Ulbrich Wire for custom finishes.*

Heat Treatment

Titanium Grade 3 can only be hardened by cold work.

Welding

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

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