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## **TITANIUM GRADE 2, UNS R50400**

**(Commercially Pure Titanium: Grade 2) (40A) Strip, Coil, Foil, Wire,  
ASTM B265 GR2, AMS 4902, ASTM F67, MIL-T-9046CP3**

### **Applications**

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

### **Description**

Commercially Pure Titanium Grade 2 is slightly stronger than Grade 1 but equally corrosion resistant against most applications. Best strength to weight ratio of any corrosion resistant material. This grade is one of the most common Titanium Grades and is used for Heat exchangers, condenser tubing and bleaching plants in paper industry, offshore oil installation water pipe lines. 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: 0.25 max

Carbon: 0.10 max

Nitrogen: 0.03 max

Hydrogen: 0.015 max

Residuals each 0.10 max, total 0.40 max

### **Physical Properties**

Density: 0.163 lbs/in<sup>3</sup>, 4.51 g/cm<sup>3</sup>

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

70 - 212 °F (20 - 100 °C):  $4.78 \times 10^{-6}$  (8.6)

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

At 70 °F (21 °C): 114 (16.4)

Modulus of Elasticity, ksi (MPa)

$15.2 \times 10^3$  ( $105 \times 10^3$ ) in tension

Melting Point: 3040 °F (1670 °C)

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## Forms

Coil – Strip, Foil, Ribbon

Wire – Profile, Round, Flat, Square

## Mechanical Properties at Room Temperature

### Properties Annealed:

Ultimate Tensile Strength: 50 KSI min (345 MPa min)

Yield Strength (0.2% offset): 40 - 65 KSI (276 - 448 MPa )

Elongation: 20% min

### Properties: Tempered

Titanium Grade 2 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 2 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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