

TIMET CP Titanium (ASTM Grade 3)

Category : Metal , Nonferrous Metal , Titanium Alloy , Unalloyed/Modified Titanium

Material Notes:

Commercially Pure Titanium. Industry Specifications: USA Aerospace: AMS 4900. Germany Aerospace: 3.7055. France: T-50. UK Aerospace Specification DTD 5023, 5273. Features: The mechanical properties of CP titanium are influenced by small additions of oxygen and iron. By careful control of these additions, the various grades of commercially pure titanium are produced to give properties suited to different applications. TIMETAL 65A is equivalent to ASTM Grade 3. It is a general purpose grade of commercially pure titanium that has excellent corrosion resistance in highly oxidizing to mildly reducing environments, including chlorides, and an excellent strength to weight ratio. It offers the highest ASME allowable design stresses of any commercially pure grade of titanium. 65A also has good impact properties at low temperatures. It can be satisfactorily welded, machined, cold worked, hot worked, and cast. It is nonmagnetic. Typical heat treatment for this alloy: Anneal at 700°C for 1 hour and air cool. Stress Relieve at 500°C for 30 mins and air cool. Data provided by TIMET.

Order this product through the following link:

http://www.lookpolymers.com/polymer_TIMET-CP-Titanium-ASTM-Grade-3.php

Physical Properties	Metric	English	Comments
Density	4.51 g/cc	0.163 lb/in ³	Typical

Mechanical Properties	Metric	English	Comments
Tensile Strength, Ultimate	585 MPa	84800 psi	Typical
Tensile Strength, Yield	450 MPa @Strain 0.200 %	65300 psi @Strain 0.200 %	Typical
Elongation at Break	25 %	25 %	Typical
Reduction of Area	48 %	48 %	Typical
Modulus of Elasticity	105 - 120 GPa	15200 - 17400 ksi	Typical
Fatigue Strength	116 MPa @# of Cycles 1.00e+7	16800 psi @# of Cycles 1.00e+7	Notched, Kt=4; rotating bend (sample with UTS = 589 MPa)
	116 MPa @# of Cycles 1.00e+7	16800 psi @# of Cycles 1.00e+7	Notched, Kt=3.3; rotating bend (sample with UTS = 550 MPa)
	123 MPa @# of Cycles 1.00e+7	17800 psi @# of Cycles 1.00e+7	Notched, Kt=3; rotating bend (sample with UTS = 589 MPa)
	147 MPa @# of Cycles 1.00e+7	21300 psi @# of Cycles 1.00e+7	Notched, Kt=2; rotating bend (sample with UTS = 589 MPa)
	170 MPa	24700 psi	Notched, Kt=2; rotating bend (sample with UTS = 550 MPa)

Mechanical Properties	@# of Cycles 1.00e+7 Metric	@# of Cycles 1.00e+7 English	Comments
	247 MPa	35800 psi	Notched, Kt=1.5; rotating bend (sample with UTS = 550 MPa)
	@# of Cycles 1.00e+7	@# of Cycles 1.00e+7	
	263 MPa	38100 psi	Smooth, Kt=1; rotating bend (sample with UTS = 550 Mpa)
	@# of Cycles 1.00e+7	@# of Cycles 1.00e+7	
	278 MPa	40300 psi	Smooth, Kt=1; rotating bend (sample with UTS = 589 Mpa)
	@# of Cycles 1.00e+7	@# of Cycles 1.00e+7	
Bend Radius, Minimum	2.5 t	2.5 t	Typical; sheet
	@Thickness 2.00 mm	@Thickness 0.0787 in	

Thermal Properties	Metric	English	Comments
CTE, linear	8.60 $\mu\text{m}/\text{m}\cdot^\circ\text{C}$	4.78 $\mu\text{in}/\text{in}\cdot^\circ\text{F}$	
	@Temperature 20.0 - 100 $^\circ\text{C}$	@Temperature 68.0 - 212 $^\circ\text{F}$	
	9.50 $\mu\text{m}/\text{m}\cdot^\circ\text{C}$	5.28 $\mu\text{in}/\text{in}\cdot^\circ\text{F}$	
	@Temperature 20.0 - 300 $^\circ\text{C}$	@Temperature 68.0 - 572 $^\circ\text{F}$	
	9.70 $\mu\text{m}/\text{m}\cdot^\circ\text{C}$	5.39 $\mu\text{in}/\text{in}\cdot^\circ\text{F}$	
	@Temperature 20.0 - 500 $^\circ\text{C}$	@Temperature 68.0 - 932 $^\circ\text{F}$	
Thermal Conductivity	21.79 W/m-K	151.2 BTU-in/hr-ft ² - $^\circ\text{F}$	
Maximum Service Temperature, Air	425 $^\circ\text{C}$	797 $^\circ\text{F}$	Continuous
	540 $^\circ\text{C}$	1000 $^\circ\text{F}$	Intermittent
Beta Transus	920 $^\circ\text{C}$	1690 $^\circ\text{F}$	

Component Elements Properties	Metric	English	Comments
Carbon, C	<= 0.080 %	<= 0.080 %	
Hydrogen, H	<= 0.015 %	<= 0.015 %	
Iron, Fe	<= 0.30 %	<= 0.30 %	
Nitrogen, N	<= 0.050 %	<= 0.050 %	
Oxygen, O	<= 0.35 %	<= 0.35 %	
Titanium, Ti	>= 98.8 %	>= 98.8 %	As Remainder

Electrical Properties	Metric	English	Comments
Electrical Resistivity	0.0000540 ohm-cm	0.0000540 ohm-cm	

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