TIMETAL® 65A CP Titanium (ASTM Grade 3)

Subcategory: Metal; Nonferrous Metal; Titanium Alloy; Unalloyed/Modified Titanium

Key Words: UNS R50550

Component	Wt. %
C	Max 0.08
Fe	Max 0.3
H	Max 0.015
N	Max 0.05
O	Max 0.35
Ti	Min 98.8

Material Notes:

Titanium content above is calculated as the remainder and may not reflect the actual range.

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.

Physical Properties	Metric	English	Comments
Density	4.51 g/cc	0.163 lb/in³	Typical

Mechanical Properties

Tensile Strength, Ultimate	585 MPa	84800 psi	Typical
Tensile Strength, Yield	450 MPa	65300 psi	Typical 0.2% Proof Stress
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	16800 psi	Notched, Kt=4; limit at 10^7 cycles; rotating bend (sample with UTS = 589 MPa)
Fatigue Strength	116 MPa	16800 psi	Notched, Kt=3.3; limit at 10^7 cycles; rotating bend (sample with UTS = 550 MPa)
Fatigue Strength	123 MPa	17800 psi	Notched, Kt=3; limit at 10^7 cycles; rotating bend (sample with UTS = 589 MPa)
Fatigue Strength	147 MPa	21300 psi	Notched, Kt=2; limit at 10^7 cycles; rotating bend (sample with UTS = 589 MPa)
Fatigue Strength	170 MPa	24700 psi	Notched, Kt=2; limit at 10^7 cycles; rotating bend (sample with UTS = 550 MPa)
Fatigue Strength	247 MPa	35800 psi	Notched, Kt=1.5; limit at 10^7 cycles; rotating bend (sample with UTS = 550 MPa)
Fatigue Strength	263 MPa	38100 psi	Smooth, Kt=1; limit at 10^7 cycles; rotating bend (sample with UTS = 550 MPa)
Fatigue Strength	278 MPa	40300 psi	Smooth, Kt=1; limit at 10^7 cycles; rotating bend (sample with UTS = 589 MPa)

Electrical Properties

Electrical Resistivity	5.4e-005 ohm-cm	5.4e-005 ohm-cm

Thermal Properties

CTE, linear 20°C	8.6 µm/m-°C	4.78 µin/in-°F	20-100°C
CTE, linear 250°C	9.5 µm/m-°C	5.28 µin/in-°F	20-300°C
CTE, linear 500°C	9.7 µm/m-°C	5.39 µin/in-°F	20-500°C
Thermal Conductivity	21.79 W/m-K	151 BTU-in/hr-ft²-°F	
Maximum Service Temperature, Air	425 °C	797 °F	Continuous
Maximum Service Temperature, Air	540 °C	1000 °F	Intermittant
Beta Transus	920 °C	1690 °F	

Some of the values displayed above may have been converted from their original units and/or rounded in order to display the information in a consistant format. Users requiring more precise data for scientific or engineering calculations can click on the property value to see the original value as well as raw conversions to equivalent units. We advise that you only use the original value or one of its raw conversions in your calculations to minimize rounding error.