

TIMET TIMETAL® 551 (Ti-4Al-4Mo-4Sn-0.5Si) Titanium Alloy; 25-100 mm

Category : Metal , Nonferrous Metal , Titanium Alloy , Alpha/Beta Titanium Alloy

Material Notes:

High-Strength Forging Alloy Industry Specifications: UK Aerospace Specifications BS TA.38, 39, 40, 41, 42. Features: TIMETAL 551 has high strength and is creep resistant up to 400°C. It has a similar composition to TIMETAL 550, apart from an increase in tin content, which gives increased strength at room and elevated temperatures. This is one of the strongest of the commercially available titanium alloys, with room temperature strengths ranging from 1250 to 1400 MPa. Typical applications include airframe structural forgings and machined parts such as undercarriage components, mounting brackets and pump casing where strength is required at low weight; and gas-turbine engine components. The alloy is also suitable for general engineering applications such as steam-turbine blades, axial and radial compressor parts, connecting rods, and other high-speed rotating and reciprocating components. It is nonmagnetic. Typical heat treatment for this alloy: Solution heat treatment: 900°C for 1 hr, air cool. Ageing heat treatment: 500°C for 24 hrs, air cool. Data provided by TIMET.

Order this product through the following link:

http://www.lookpolymers.com/polymer_TIMET-TIMETAL-551-Ti-4Al-4Mo-4Sn-05Si-Titanium-Alloy-25-100-mm.php

Physical Properties	Metric	English	Comments
Density	4.60 g/cc	0.166 lb/in ³	Typical

Mechanical Properties	Metric	English	Comments
Tensile Strength, Ultimate	1310 MPa	190000 psi	Typical
Tensile Strength, Yield	1200 MPa @Strain 0.200 %	174000 psi @Strain 0.200 %	Typical
Elongation at Break	10 %	10 %	Typical
Reduction of Area	20 %	20 %	
Modulus of Elasticity	110 - 120 GPa	16000 - 17400 ksi	Typical
Poissons Ratio	0.34	0.34	Calculated by MatWeb
Fatigue Strength	380 MPa @# of Cycles 1.00e+8	55100 psi @# of Cycles 1.00e+8	Notched, Kt = 3.2; 3" (75 mm) square billet
	520 MPa @# of Cycles 1.00e+8	75400 psi @# of Cycles 1.00e+8	Smooth; 3" (75 mm) square billet
Shear Modulus	43.0 GPa	6240 ksi	
Charpy Impact	25.0 J	18.4 ft-lb	at RT

Thermal Properties	Metric	English	Comments
	8.50 µm/m-°C	4.72 µin/in-°F	

Thermal Properties	Metric @ Temperature 20.0 - 100 °C	English @ Temperature 68.0 - 212 °F	Comments
Specific Heat Capacity	0.368 J/g-°C	0.0880 BTU/lb-°F	
Thermal Conductivity	6.92 W/m-K	48.0 BTU-in/hr-ft ² -°F	
Maximum Service Temperature, Air	400 °C	752 °F	Useful creep to 400°C
Beta Transus	1050 °C	1920 °F	

Component Elements Properties	Metric	English	Comments
Aluminum, Al	3.0 - 5.0 %	3.0 - 5.0 %	
Carbon, C	0.050 - 0.20 %	0.050 - 0.20 %	
Hydrogen, H	<= 0.015 %	<= 0.015 %	
Iron, Fe	<= 0.20 %	<= 0.20 %	
Molybdenum, Mo	3.0 - 5.0 %	3.0 - 5.0 %	
Nitrogen, N	<= 0.050 %	<= 0.050 %	
Oxygen, O	<= 0.25 %	<= 0.25 %	
Silicon, Si	0.30 - 0.70 %	0.30 - 0.70 %	
Tin, Sn	3.0 - 5.0 %	3.0 - 5.0 %	
Titanium, Ti	83.2 - 90.7 %	83.2 - 90.7 %	Calculated as remainder

Electrical Properties	Metric	English	Comments
Electrical Resistivity	0.000170 ohm-cm	0.000170 ohm-cm	

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