



ASM Aerospace Specification Metals Inc.



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Titanium Grade 4, Annealed

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

Close Analogs: Titanium Grades 1,2,3,4,7,11,and 12 are all considered unalloyed and have similar mechanical properties.

Key Words: ASTM Grade 4: UNS R50700, CP titanium, C.P. titanium alloy

Component	Wt. %
C	Max 0.1
Fe	Max 0.5
H	Max 0.015
N	Max 0.05
O	Max 0.4
Ti	99

Material Notes:

Information provided by Allvac and the references.

Applications: Airframe components, cryogenic vessels, heat exchangers, CPI equipment, condenser tubing, pickling baskets. Sample was annealed 2 hr at 700°C.

Physical Properties	Metric	English	Comments
Density	<u>4.51 g/cc</u>	0.163 lb/in ³	

Mechanical Properties

Hardness, Brinell	265	265	
Hardness, Knoop	296	296	Estimated from Brinell.
Hardness, Rockwell B	104	104	
Hardness, Rockwell C	23	23	Estimated from Brinell.
Hardness, Vickers	280	280	Estimated from Brinell.
Tensile Strength, Ultimate	<u>660 MPa</u>	95700 psi	

Tensile Strength, Yield	590 MPa	85600 psi	
Elongation at Break	20 %	20 %	
Modulus of Elasticity	105 GPa	15200 ksi	Unspecified heat treatment in tension
Compressive Modulus	110 GPa	16000 ksi	unspecified heat treatment
Notched Tensile Strength	900 MPa	131000 psi	K_t (stress concentration factor) = 3.0
Poisson's Ratio	0.34	0.34	
Shear Modulus	39 GPa	5660 ksi	

Electrical Properties

Electrical Resistivity	6e-005 ohm-cm	6e-005 ohm-cm	
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Thermal Properties

Heat of Fusion	325 J/g	140 BTU/lb	High Purity Ti.
CTE, linear 20°C	8.6 $\mu\text{m}/\text{m}\cdot^\circ\text{C}$	4.78 $\mu\text{in}/\text{in}\cdot^\circ\text{F}$	20-93°C
CTE, linear 250°C	9.2 $\mu\text{m}/\text{m}\cdot^\circ\text{C}$	5.11 $\mu\text{in}/\text{in}\cdot^\circ\text{F}$	Unspecified heat treatment. Average over the range 0-315°C
Specific Heat Capacity	0.54 J/g-°C	0.129 BTU/lb-°F	
Thermal Conductivity	16.9 W/m-K	117 BTU-in/hr-ft ² -°F	
Melting Point	Max 1660 °C	Max 3020 °F	Liquidus
Liquidus	1660 °C	3020 °F	
Beta Transus	950 °C	1740 °F	

Optical Properties

Emissivity (0-1)	0.3	0.3	High purity Ti at 710°C
Reflection Coefficient, Visible (0-1)	0.56	0.56	High purity Ti; visible light.

References for this datasheet.

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 consistent 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.