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Aluminum 6063-T6

Subcategory: 6000 Series Aluminum Alloy; Aluminum Alloy; Metal; Nonferrous Metal

Close Analogs:

Composition Notes:
Aluminum content reported is calculated as remainder.
Composition information provided by the Aluminum Association and is not for design.

Key Words: UNS A96063; ISO AlMg0.5Si; Aluminium 6063-T6; AA6063-T6

Component	Wt. %	Component	Wt. %	Component	Wt. %
Al	Max 97.5	Mg	0.45 - 0.9	Si	0.2 - 0.6
Cr	Max 0.1	Mn	Max 0.1	Ti	Max 0.1
Cu	Max 0.1	Other, each	Max 0.05	Zn	Max 0.1
Fe	Max 0.35	Other, total	Max 0.15		

Material Notes:

Data points with the AA note have been provided by the Aluminum Association, Inc. and are NOT FOR DESIGN.

Physical Properties	Metric	English	Comments
Density	2.7 g/cc	0.0975 lb/in³	AA; Typical

Mechanical Properties			
Hardness, Brinell	73	73	AA; Typical; 500 g load; 10 mm ball
Hardness, Knoop	96	96	Converted from Brinell Hardness Value
Hardness, Vickers	83	83	Converted from Brinell Hardness Value
Ultimate Tensile Strength	241 MPa	35000 psi	AA; Typical
Tensile Yield Strength	214 MPa	31000 psi	AA; Typical
Elongation at Break	12 %	12 %	AA; Typical; 1/16 in. (1.6 mm) Thickness
Modulus of Elasticity	68.9 GPa	10000 ksi	AA; Typical; Average of tension and compression. Compression modulus is about 2% greater than tensile modulus.
Ultimate Bearing Strength	434 MPa	62900 psi	Edge distance/pin diameter = 2.0
Bearing Yield Strength	276 MPa	40000 psi	Edge distance/pin diameter = 2.0
Poisson's Ratio	0.33	0.33	
Fatigue Strength	68.9 MPa	10000 psi	AA; 500,000,000 cycles completely reversed stress; RR

			Moore machine/specimen
Machinability	50 %	50 %	0-100 Scale of Aluminum Alloys
Shear Modulus	25.8 GPa	3740 ksi	
Shear Strength	152 MPa	22000 psi	AA; Typical

Electrical Properties

Electrical Resistivity	3.32e-006 ohm-cm	3.32e-006 ohm-cm	AA; Typical at 68°F

Thermal Properties

CTE, linear 68°F	23.4 µm/m-°C	13 µin/in-°F	AA; Typical; Average over 68-212°F range.
CTE, linear 250°C	25.6 µm/m-°C	14.2 µin/in-°F	Average over the range 20-300ºC
Specific Heat Capacity	0.9 J/g-°C	0.215 BTU/lb-°F	
Thermal Conductivity	200 W/m-K	1390 BTU-in/hr-ft²-°F	AA; Typical at 77°F
Melting Point	616 - 654 °C	1140 - 1210 °F	AA; Typical range based on typical composition for wrought products 1/4 inch thickness or greater
Solidus	616 °C	1140 °F	AA; Typical
Liquidus	654 °C	1210 °F	AA; Typical

Processing Properties

Annealing Temperature	413 °C	775 °F	hold at temperature for 2 to 3 hr; cool at 50°F per hour from 775 to 500°F
Solution Temperature	521 °C	970 °F	
Aging Temperature	177 °C	350 °F	hold at temperature for 8 hr

References for this datasheet.