Aluminum 6061-T6; 6061-T651

Physical Properties	Metric	English	Comments
Density	2.70 g/cc	0.0975 lb/in³	AA; Typical

Mechanical Properties	Metric	English	Comments
Hardness, Brinell	95	95	AA; Typical; 500 g load; 10 mm ball
Hardness, Knoop	120	120	Converted from Brinell Hardness Value
Hardness, Rockwell A	40	40	Converted from Brinell Hardness Value
Hardness, Rockwell B	60	60	Converted from Brinell Hardness Value
Hardness, Vickers	107	107	Converted from Brinell Hardness Value
Tensile Strength, Ultimate	310 MPa	45000 psi	AA; Typical
	24.0 MPa @Temperature 371 °C	3480 psi @Temperature 700 °F	
	32.0 MPa @Temperature 316 °C	4640 psi @Temperature 601 °F	
	51.0 MPa @Temperature 260 °C	7400 psi @Temperature 500 °F	
	131 MPa @Temperature 204 °C	19000 psi @Temperature 399 °F	
	234 MPa @Temperature 149 °C	33900 psi @Temperature 300 °F	
	290 MPa @Temperature 100 °C	42100 psi @Temperature 212 °F	
	310 MPa @Temperature 24.0 °C	45000 psi @Temperature 75.2 °F	
	324 MPa @Temperature -28.0 °C	47000 psi @Temperature -18.4 °F	
	338 MPa @Temperature -80.0 °C	49000 psi @Temperature -112 °F	
	414 MPa @Temperature -196 °C	60000 psi @Temperature -321 °F	
Tensile Strength, Yield	276 MPa	40000 psi	AA; Typical
	12.0 MPa @Strain 0.2 %, Temperature 371 °C	1740 psi @Strain 0.2 %, Temperature 700 °F	
	19.0 MPa @Strain 0.2 %, Temperature 316 °C	2760 psi @Strain 0.2 %, Temperature 601 °F	

	34.0 MPa @Strain 0.2 %, Temperature 260 °C	4930 psi @Strain 0.2 %, Temperature 500 °F	
	103 MPa @Strain 0.2 %, Temperature 204 °C	14900 psi @Strain 0.2 %, Temperature 399 °F	
	214 MPa @Strain 0.2 %, Temperature 149 °C	31000 psi @Strain 0.2 %, Temperature 300 °F	
	262 MPa @Strain 0.2 %, Temperature 100 °C	38000 psi @Strain 0.2 %, Temperature 212 °F	
	276 MPa @Strain 0.2 %, Temperature 24.0 °C	40000 psi @Strain 0.2 %, Temperature 75.2 °F	
	283 MPa @Strain 0.2 %, Temperature -28.0 °C	41000 psi @Strain 0.2 %, Temperature -18.4 °F	
	290 MPa @Strain 0.2 %, Temperature -80.0 °C	42100 psi @Strain 0.2 %, Temperature -112 °F	
	324 MPa @Strain 0.2 %, Temperature -196 °C	47000 psi @Strain 0.2 %, Temperature -321 °F	
Elongation at Break	17 % @Temperature -28.0 °C	17 % @Temperature -18.4 °F	
	17 % @Temperature 24.0 °C	17 % @Temperature 75.2 °F	
	18 % @Temperature -80.0 °C	18 % @Temperature -112 °F	
	18 % @Temperature 100 °C	18 % @Temperature 212 °F	
	20 % @Temperature 149 °C	20 % @Temperature 300 °F	
	22 % @Temperature -196 °C	22 % @Temperature -321 °F	
	28 % @Temperature 204 °C	28 % @Temperature 399 °F	
	60 % @Temperature 260 °C	60 % @Temperature 500 °F	
	85 % @Temperature 316 °C	85 % @Temperature 601 °F	
	95 % @Temperature 371 °C	95 % @Temperature 700 °F	
	12 % @Thickness 1.59 mm	12 % @Thickness 0.0625 in	AA; Typical
	17 % @Diameter 12.7 mm	17 % @Diameter 0.500 in	AA; Typical
Modulus of Elasticity	68.9 GPa	10000 ksi	AA; Typical; Average of tension and compression. Compression modulus is about 2% greater than tensile modulus.
Notched Tensile Strength	324 MPa	47000 psi	2.5 cm width x 0.16 cm thick side-notched specimen, K_t = 17.
Ultimate Bearing Strength	607 MPa	88000 psi	Edge distance/pin diameter = 2.0
Bearing Yield Strength	386 MPa	56000 psi	Edge distance/pin diameter = 2.0
Poissons Ratio	0.33	0.33	Estimated from trends in similar Al alloys.
Fatigue Strength	96.5 MPa @# of Cycles 5.00e+8	14000 psi @# of Cycles 5.00e+8	completely reversed stress; RR Moore machine/specimen
Fracture Toughness	29.0 MPa-m½	26.4 ksi-in½	K_{IC}; TL orientation.
Machinability	50 %	50 %	0-100 Scale of Aluminum Alloys
Shear Modulus	26.0 GPa	3770 ksi	Estimated from similar Al alloys.

Shear Strength	207 MPa	30000 psi	AA; Typical

Electrical Properties	Metric	English	Comments
Electrical Resistivity	0.00000399 ohm-cm @Temperature 20.0 °C	0.00000399 ohm-cm @Temperature 68.0 °F	AA; Typical

Thermal Properties	Metric	English	Comments
CTE, linear	23.6 µm/m-°C @Temperature 20.0 - 100 °C	13.1 µin/in-°F @Temperature 68.0 - 212 °F	AA; Typical; average over range
	25.2 µm/m-°C @Temperature 20.0 - 300 °C	14.0 µin/in-°F @Temperature 68.(572 °F	
Specific Heat Capacity	0.896 J/g-°C	0.214 BTU/lb-°F	
Thermal Conductivity	167 W/m-K	1160 BTU-in/hr-ft²-°F	AA; Typical at 77°F
Melting Point	582 - 651.7 °C	1080 - 1205 °F	AA; Typical range based on typical composition for wrought products >= 1/4 in. thickness. Eutectic melting can be eliminated by homogenization.
Solidus	582 °C	1080 °F	AA; Typical
Liquidus	651.7 °C	1205 °F	AA; Typical

Processing Properties	Metric	English	Comments
Solution Temperature	529 °C	985 °F	
Aging Temperature	160 °C	320 °F	Rolled or drawn products; hold at temperature for 18 hr
	177 °C	350 °F	Extrusions or forgings; hold at temperature for 8 hr

Component Elements Properties	Metric	English	Comments
Aluminum, Al	95.8 - 98.6 %	95.8 - 98.6 %	As remainder
Chromium, Cr	0.04 - 0.35 %	0.04 - 0.35 %	
Copper, Cu	0.15 - 0.40 %	0.15 - 0.40 %	
Iron, Fe	<= 0.70 %	<= 0.70 %	
Magnesium, Mg	0.80 - 1.2 %	0.80 - 1.2 %	
Manganese, Mn	<= 0.15 %	<= 0.15 %	
Other, each	<= 0.05 %	<= 0.05 %	
Other, total	<= 0.15 %	<= 0.15 %	
Silicon, Si	0.40 - 0.80 %	0.40 - 0.80 %	
Titanium, Ti	<= 0.15 %	<= 0.15 %	
Zinc, Zn	<= 0.25 %	<= 0.25 %	