

## Aluminum A356.0-T6, Sand Cast

Categories: [Metal](#); [Nonferrous Metal](#); [Aluminum Alloy](#); [Aluminum Casting Alloy](#)

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

**Composition Notes:**

Composition information provided by the Aluminum Association and is not for design.

**Key Words:** Aluminium A356.0-T6; UNS A13560; AAA356.0-T6


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Physical Properties	Metric	English	Comments
Density	2.67 g/cc	0.0965 lb/in <sup>3</sup>	
Mechanical Properties	Metric	English	Comments
Hardness, Brinell	70 - 105	70 - 105	AA; Typical; 500 g load; 10 mm ball
Hardness, Knoop	112	112	Estimated from Brinell Hardness.
Hardness, Rockwell A	37	37	Estimated from Brinell Hardness.
Hardness, Rockwell B	55	55	Estimated from Brinell Hardness.
Hardness, Vickers	99	99	Estimated from Brinell Hardness.
Tensile Strength, Ultimate	>= 234 MPa	>= 34000 psi	AA
Tensile Strength, Yield	>= 165 MPa @Strain 0.200 %	>= 24000 psi @Strain 0.200 %	AA
Elongation at Break	>= 3.5 %	>= 3.5 %	AA; In 2 In. (50 mm) or 4D
Modulus of Elasticity	72.4 GPa	10500 ksi	In Tension; elastic modulus in compression is typically about 2% higher for aluminum alloys.
Poissons Ratio	0.33	0.33	
Machinability	50 %	50 %	0-100 Scale (100=best)
Shear Modulus	27.2 GPa	3950 ksi	
Shear Strength	143 MPa	20700 psi	Calculated
Electrical Properties	Metric	English	Comments
Electrical Resistivity	0.0000440 ohm-cm	0.0000440 ohm-cm	
Thermal	Metric	English	Comments

**Properties**

Heat of Fusion	389 J/g	167 BTU/lb	
CTE, linear 	21.4 $\mu\text{m}/\text{m}\cdot^\circ\text{C}$	11.9 $\mu\text{in}/\text{in}\cdot^\circ\text{F}$	
	@Temperature 20.0 - 100 $^\circ\text{C}$	@Temperature 68.0 - 212 $^\circ\text{F}$	
	23.2 $\mu\text{m}/\text{m}\cdot^\circ\text{C}$	12.9 $\mu\text{in}/\text{in}\cdot^\circ\text{F}$	
	@Temperature 20.0 - 300 $^\circ\text{C}$	@Temperature 68.0 - 572 $^\circ\text{F}$	
Specific Heat Capacity	0.963 J/g- $^\circ\text{C}$	0.230 BTU/lb- $^\circ\text{F}$	
Thermal Conductivity	151 W/m-K	1050 BTU-in/hr-ft <sup>2</sup> - $^\circ\text{F}$	
Melting Point	557 - 613 $^\circ\text{C}$	1030 - 1140 $^\circ\text{F}$	
Solidus	557 $^\circ\text{C}$	1030 $^\circ\text{F}$	
Liquidus	613 $^\circ\text{C}$	1140 $^\circ\text{F}$	

Processing Properties	Metric	English	Comments
Melt Temperature	677 - 816 $^\circ\text{C}$	1250 - 1500 $^\circ\text{F}$	
Solution Temperature	535 - 540.6 $^\circ\text{C}$	995 - 1005 $^\circ\text{F}$	hold at temperature for 12 hr; cool in water at 150 to 212 $^\circ\text{F}$
Aging Temperature	152 - 157 $^\circ\text{C}$	305 - 315 $^\circ\text{F}$	hold at temperature 2 - 5 hrs; start with solution heat-treated material
Casting Temperature	677 - 788 $^\circ\text{C}$	1250 - 1450 $^\circ\text{F}$	

Component Elements Properties	Metric	English	Comments
Aluminum, Al	91.1 - 93.3 %	91.1 - 93.3 %	As remainder
Copper, Cu	$\leq 0.20$ %	$\leq 0.20$ %	
Iron, Fe	$\leq 0.20$ %	$\leq 0.20$ %	
Magnesium, Mg	0.25 - 0.45 %	0.25 - 0.45 %	
Manganese, Mn	$\leq 0.10$ %	$\leq 0.10$ %	
Other, each	$\leq 0.050$ %	$\leq 0.050$ %	
Other, total	$\leq 0.15$ %	$\leq 0.15$ %	
Silicon, Si	6.5 - 7.5 %	6.5 - 7.5 %	
Titanium, Ti	$\leq 0.20$ %	$\leq 0.20$ %	
Zinc, Zn	$\leq 0.10$ %	$\leq 0.10$ %	