

Aluminum 319.0-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 319.0-T6; UNS A03190; AA319.0-T6, ISO 3522: AISi5Cu3, AISi5Cu3Mn; AISi6Cu4; AISi6Cu4Mn. ISO R164: AISi5Cu3; AISi5Cu3Fe; AISi6Cu4; ISO 3522: AISi5Cu3

Vendors: No vendors are listed for this material. Please [click here](#) if you are a supplier and would like information on how to add your listing to this material.

Physical Properties	Metric	English	Comments
Density	2.79 g/cc	0.101 lb/in ³	

Mechanical Properties	Metric	English	Comments
Hardness, Brinell	65.0 - 95.0	65.0 - 95.0	AA; Typical; 500 g load; 10 mm ball
Hardness, Knoop	103	103	Estimated from Brinell Hardness.
Hardness, Rockwell B	49	49	Estimated from Brinell Hardness.
Hardness, Vickers	90	90	Estimated from Brinell Hardness.
Tensile Strength, Ultimate	>= 214 MPa	>= 31000 psi	AA
Tensile Strength, Yield	>= 138 MPa @Strain 0.200 %	>= 20000 psi @Strain 0.200 %	AA
Elongation at Break	>= 1.50 %	>= 1.50 %	AA; in 2 in. (50 mm) or 4D
Modulus of Elasticity	74.0 GPa	10700 ksi	In Tension; elastic modulus in compression is typically about 2% higher for aluminum alloys.
Compressive Yield Strength	170 MPa	24700 psi	
Poissons Ratio	0.330	0.330	
Fatigue Strength	75.0 MPa @# of Cycles 5.00e+8	10900 psi @# of Cycles 5.00e+8	Notch Status unknown, R.R. Moore Test
Machinability	50 %	50 %	0-100 Scale (100=best)
Shear Modulus	28.0 GPa	4060 ksi	
Shear Strength	200 MPa	29000 psi	

Electrical Properties	Metric	English	Comments
Electrical Resistivity	0.00000640 ohm-cm	0.00000640 ohm-cm	

Thermal Properties	Metric	English	Comments
Heat of Fusion	389 J/g	167 BTU/lb	
CTE, linear 	21.4 µm/m-°C @Temperature 20.0 - 100 °C	11.9 µin/in-°F @Temperature 68.0 - 212 °F	
	22.9 µm/m-°C @Temperature 20.0 - 300 °C	12.7 µin/in-°F @Temperature 68.0 - 572 °F	
Specific Heat Capacity	0.963 J/g-°C	0.230 BTU/lb-°F	
Thermal Conductivity	109 W/m-K	756 BTU-in/hr-ft ² -°F	
Melting Point	516 - 604 °C	961 - 1120 °F	
Solidus	516 °C	961 °F	
Liquidus	604 °C	1120 °F	

Processing Properties	Metric	English	Comments
Melt Temperature	677 - 816 °C	1250 - 1500 °F	
Solution Temperature	502 - 507 °C	935 - 945 °F	hold at temperature 12 hr, cool in water at 150 to 212°F
Aging Temperature	152 - 157 °C	305 - 315 °F	hold at temperature 2 - 5 hr
Casting Temperature	677 - 788 °C	1250 - 1450 °F	

Component Elements Properties	Metric	English	Comments
Aluminum, Al	85.8 - 91.5 %	85.8 - 91.5 %	As remainder
Copper, Cu	3.0 - 4.0 %	3.0 - 4.0 %	
Iron, Fe	<= 1.0 %	<= 1.0 %	
Magnesium, Mg	<= 0.10 %	<= 0.10 %	
Manganese, Mn	<= 0.50 %	<= 0.50 %	
Nickel, Ni	<= 0.35 %	<= 0.35 %	
Other, total	<= 0.50 %	<= 0.50 %	
Silicon, Si	5.50 - 6.50 %	5.50 - 6.50 %	
Titanium, Ti	<= 0.25 %	<= 0.25 %	
Zinc, Zn	<= 1.0 %	<= 1.0 %	

[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. We also ask that you refer to MatWeb's [terms of use](#) regarding this information. [Click here](#) to view all the property values for this datasheet as they were originally entered into MatWeb.