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: AlSi5Cu3, AlSi5Cu3Mn; AlSi6Cu4; AlSi6Cu4Mn. ISO R164: AlSi5Cu3; AlSi5Cu3Fe; AlSi6Cu4; ISO 3522: AlSi5Cu3
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/in³	

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.
Ultimate Tensile Strength	>= 214 MPa	>= 31.0 ksi	AA
Tensile Yield Strength	>= 138 MPa	>= 20.0 ksi	AA; 0.2% Offset
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-ft²-°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	

Material Components 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.