



ASM Aerospace Specification Metals Inc.



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Aluminum 2219-T81

Subcategory: 2000 Series Aluminum Alloy; Aluminum Alloy; Metal; Nonferrous Metal

Close Analogs:

Composition Notes:

This designation is considered the sole original alloy for this alloy family.

Aluminum content reported is calculated as remainder.

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

Key Words: UNS A92219; ISO AlCu6Mn; Aluminium 2219-T81; AA2219-T81

Component	Wt. %	Component	Wt. %	Component	Wt. %
Al	91.5 - 93.8	Mn	0.2 - 0.4	Ti	0.02 - 0.1
Cu	5.8 - 6.8	Other, each	Max 0.05	V	0.05 - 0.15
Fe	Max 0.3	Other, total	Max 0.15	Zn	Max 0.1
Mg	Max 0.02	Si	Max 0.2	Zr	0.1 - 0.25

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	<u>2.84 g/cc</u>	0.103 lb/in ³	AA; Typical

Mechanical Properties

Hardness, Brinell	130	130	500 kg load with 10 mm ball
Hardness, Knoop	163	163	Converted from Brinell Hardness Value
Hardness, Rockwell A	49.5	49.5	Converted from Brinell Hardness Value
Hardness, Rockwell B	80	80	Converted from Brinell Hardness Value
Hardness, Vickers	149	149	Converted from Brinell Hardness Value
Ultimate Tensile Strength	<u>455 MPa</u>	66000 psi	AA; Typical
Tensile Yield Strength	<u>352 MPa</u>	51000 psi	AA; Typical

Elongation at Break	<u>10 %</u>	10 %	AA; Typical; 1/16 in. (1.6 mm) Thickness
Modulus of Elasticity	<u>73.1 GPa</u>	10600 ksi	AA; Typical; Average of tension and compression. Compression modulus is about 2% greater than tensile modulus.
Ultimate Bearing Strength	<u>896 MPa</u>	130000 psi	Edge distance/pin diameter = 2.0
Bearing Yield Strength	<u>696 MPa</u>	101000 psi	Edge distance/pin diameter = 2.0
Poisson's Ratio	0.33	0.33	Estimated from trends in similar Al alloys.
Fatigue Strength	<u>103 MPa</u>	15000 psi	AA; 500,000,000 cycles completely reversed stress; RR Moore machine/specimen
Fracture Toughness	<u>36 MPa-m^{1/2}</u>	32.8 ksi-in ^{1/2}	K _{IC} ; TL orientation.
Machinability	<u>30 %</u>	30 %	0-100 Scale of Aluminum Alloys
Shear Modulus	<u>27 GPa</u>	3920 ksi	Estimated from similar Al alloys.
Shear Strength	<u>285 MPa</u>	41300 psi	

Electrical Properties

Electrical Resistivity	<u>5.82e-006 ohm-cm</u>	5.82e-006 ohm-cm	AA; Typical at 68°F
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Thermal Properties

CTE, linear 68°F	<u>22.3 μm/m-°C</u>	12.4 μin/in-°F	AA; Typical; Average over 68-212°F range.
CTE, linear 250°C	<u>24.1 μm/m-°C</u>	13.4 μin/in-°F	Estimated from trends in similar Al alloys. 20-300°C.
Specific Heat Capacity	<u>0.864 J/g-°C</u>	0.207 BTU/lb-°F	
Thermal Conductivity	<u>121 W/m-K</u>	840 BTU-in/hr-ft ² -°F	AA; Typical at 77°F
Melting Point	543 - 643 °C	1010 - 1190 °F	AA; Typical range based on typical composition for wrought products 1/4 inch thickness or greater. Eutectic melting is not eliminated by homogenization.
Solidus	<u>543 °C</u>	1010 °F	AA; Typical
Liquidus	<u>643 °C</u>	1190 °F	AA; Typical

Processing Properties

Annealing Temperature	<u>413 °C</u>	775 °F	
Solution Temperature	<u>535 °C</u>	995 °F	
Aging Temperature	163 - 191 °C	325 - 375 °F	from 18 to 36 hr at temperature

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.