



ASM Aerospace Specification Metals Inc.



Contact Us

Aluminum 7178-O

Subcategory: 7000 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 A97178; Aluminium 7178-O; AA7178-O

Component	Wt. %	Component	Wt. %	Component	Wt. %
Al	85.3 - 89.5	Mg	2.4 - 3.1	Si	Max 0.4
Cr	0.18 - 0.28	Mn	Max 0.3	Ti	Max 0.2
Cu	1.6 - 2.4	Other, each	Max 0.05	Zn	6.3 - 7.3
Fe	Max 0.5	Other, total	Max 0.15		

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>2.83 g/cc</u>	0.102 lb/in ³	AA; Typical

Mechanical Properties

Hardness, Brinell	60	60	500 kg load with 10 mm ball
Hardness, Knoop	80	80	Converted from Brinell Hardness Value
Hardness, Vickers	68	68	Converted from Brinell Hardness Value
Ultimate Tensile Strength	<u>228 MPa</u>	33000 psi	AA; Typical
Tensile Yield Strength	<u>103 MPa</u>	15000 psi	AA; Typical
Elongation at Break	<u>15 %</u>	15 %	AA; Typical; 1/16 in. (1.6 mm) Thickness
Elongation at Break	<u>16 %</u>	16 %	AA; Typical; 1/2 in. (12.7 mm) Diameter

Modulus of Elasticity	<u>71.7 GPa</u>	10400 ksi	AA; Typical; Average of tension and compression. Compression modulus is about 2% greater than tensile modulus.
Poisson's Ratio	0.33	0.33	Estimated from trends in similar Al alloys.
Shear Modulus	<u>27 GPa</u>	3920 ksi	Estimated from similar Al alloys.
Shear Strength	<u>150 MPa</u>	21800 psi	

Electrical Properties

Electrical Resistivity	<u>4.6e-006 ohm-cm</u>	4.6e-006 ohm-cm	Estimated from other heat treatments.
------------------------	------------------------	-----------------	---------------------------------------

Thermal Properties

CTE, linear 68°F	<u>23.4 $\mu\text{m}/\text{m}\cdot^\circ\text{C}$</u>	13 $\mu\text{in}/\text{in}\cdot^\circ\text{F}$	AA; Typical; Average over 68-212°F range.
CTE, linear 250°C	<u>25.4 $\mu\text{m}/\text{m}\cdot^\circ\text{C}$</u>	14.1 $\mu\text{in}/\text{in}\cdot^\circ\text{F}$	Average over the range 20-300°C
Specific Heat Capacity	<u>0.856 J/g·°C</u>	0.205 BTU/lb·°F	
Thermal Conductivity	<u>150 W/m-K</u>	1040 BTU-in/hr-ft ² ·°F	Estimated from other heat treatments.
Melting Point	477 - 629 °C	890 - 1165 °F	AA; Typical range based on typical composition for wrought products 1/4 inch thickness or greater. Homogenization may raise eutectic melting temperature 20-40°F but usually does not eliminate eutectic melting.
Solidus	<u>477 °C</u>	890 °F	AA; Typical
Liquidus	<u>629 °C</u>	1165 °F	AA; Typical

Processing Properties

Annealing Temperature	<u>413 °C</u>	775 °F
Solution Temperature	<u>468 °C</u>	875 °F

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.