Aluminum 7178-T76; 7178-T7651

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-T76; Aluminium 7178-T7651; AA7178-T76; AA7178-T7651

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	2.83 g/cc	0.102 lb/in³	AA; Typical
Mechanical Properties			
Hardness, Brinell	152	152	500 kg load with 10 mm ball. Calculated value.
Hardness, Knoop	193	193	Converted from Brinell Hardness Value
Hardness, Rockwell A	53.9	53.9	Converted from Brinell Hardness Value
Hardness, Rockwell B	88	88	Converted from Brinell Hardness Value
Hardness, Vickers	177	177	Converted from Brinell Hardness Value
Ultimate Tensile Strength	572 MPa	83000 psi	AA; Typical
Tensile Yield Strength	503 MPa	73000 psi	AA; Typical

Elongation at Break	11 %	11 %	AA; Typical; 1/2 in. (12.7 mm) Diameter
Modulus of Elasticity	73 GPa	10600 ksi	
Modulus of Elasticity	71 GPa	10300 ksi	AA; Typical; Average of tension and compression. Compression modulus is about 2% greater than tensile modulus.
Compressive Yield Strength	460 MPa	66700 psi	0.1% Permanent Set
Poisson's Ratio	0.33	0.33	Estimated from trends in similar Al alloys.
Fatigue Strength	160 MPa	23200 psi	500,000,000 Cycles
Shear Modulus	27 GPa	3920 ksi	Estimated from similar Al alloys.
Shear Strength	340 MPa	49300 psi	Calculated value.

Electrical Properties

Electrical Resistivity	5e-006 ohm-cm	5e-006 ohm-cm	Estimated from other heat treatments.

Thermal Properties

CTE, linear 68°F	23.4 µm/m-°C	13 µin/in-°F	AA; Typical; Average over 68-212°F range.
CTE, linear 250°C	25.4 µm/m-°C	14.1 µin/in-°F	Average over the range 20-300ºC
Specific Heat Capacity	0.856 J/g-°C	0.205 BTU/lb-°F	
Thermal Conductivity	140 W/m-K	972 BTU-in/hr-ft²-°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	477 °C	890 °F	AA; Typical
Liquidus	629 °C	1165 °F	AA; Typical

Processing Properties

Annealing Temperature	413 °C	775 °F	
Solution Temperature	468 °C	875 °F	
Aging Temperature	121 °C	250 °F	for 24 hr

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 consistant 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.