Aluminum 5083-H116; 5083-H321

Subcategory: 5000 Series Aluminum Alloy; Aluminum Alloy; Metal; Nonferrous Metal

Close Analogs:

Composition Notes:
Aluminum content reported is calculated as remainder.
Composition information provided by the Aluminum Association and is not for design.

Key Words: Aluminum 5083-H321; UNS A95083; ISO AlMg4.5Mn; Aluminium 5083-H116; Aluminium 5083-H321; AA5083-H116

Component	Wt. %	Component	Wt. %	Component	Wt. %
Al	92.4 - 95.6	Mg	4 - 4.9	Si	Max 0.4
Cr	0.05 - 0.25	Mn	0.4 - 1	Ti	Max 0.15
Cu	Max 0.1	Other, each	Max 0.05	Zn	Max 0.25
Fe	Max 0.4	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	2.66 g/cc	0.0961 lb/in³	AA; Typical
Mechanical Properties			
Hardness, Brinell	85	85	500 kg load with 10 mm ball. Calculated value.
Hardness, Knoop	109	109	Converted from Brinell Hardness Value
Hardness, Rockwell A	36.5	36.5	Converted from Brinell Hardness Value
Hardness, Rockwell B	53	53	Converted from Brinell Hardness Value
Hardness, Vickers	96	96	Converted from Brinell Hardness Value
Ultimate Tensile Strength	317 MPa	46000 psi	AA; Typical
Tensile Yield Strength	228 MPa	33000 psi	AA; Typical

Elongation at Break	16 %	16 %	AA; Typical; 1/2 in. (12.7 mm) Diameter
Modulus of Elasticity	70.3 GPa	10200 ksi	In Tension
Modulus of Elasticity	71 GPa	10300 ksi	AA; Typical; Average of tension and compression. Compression modulus is about 2% greater than tensile modulus.
Compressive Modulus	71.7 GPa	10400 ksi	
Poisson's Ratio	0.33	0.33	Estimated from trends in similar Al alloys.
Fatigue Strength	159 MPa	23000 psi	AA; 500,000,000 cycles completely reversed stress; RR Moore machine/specimen
Fracture Toughness	43 MPa-m½	39.1 ksi-in½	K_{IC}; TL orientation.
Machinability	30 %	30 %	0-100 Scale of Aluminum Alloys
Shear Modulus	26.4 GPa	3830 ksi	
Shear Strength	190 MPa	27600 psi	Calculated value.

Electrical Properties

Electrical Resistivity	5.9e-006 ohm-cm	5.9e-006 ohm-cm	

Thermal Properties

CTE, linear 68°F	23.8 µm/m-°C	13.2 µin/in-°F	AA; Typical; Average over 68-212°F range.
CTE, linear 250°C	26 µm/m-°C	14.4 µin/in-°F	Average over the range 20-300ºC
Specific Heat Capacity	0.9 J/g-°C	0.215 BTU/lb-°F	
Thermal Conductivity	117 W/m-K	812 BTU-in/hr-ft²-°F	
Melting Point	591 - 638 °C	1095 - 1180 °F	AA; Typical range based on typical composition for wrought products 1/4 inch thickness or greater
Solidus	591 °C	1095 °F	AA; Typical
Liquidus	638 °C	1180 °F	AA; Typical

Processing Properties

Annealing Temperature	413 °C	775 °F	holding at temperature not required
Hot-Working Temperature	316 - 482 °C	600 - 900 °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 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.