MatWeb, The Online Materials Database

Aluminum 5083-O

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: UNS A95083; ISO AlMg4.5Mn; Aluminium 5083-O; AA5083-O

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	77	77	500 kg load with 10 mm ball. Calculated value.
Hardness, Knoop	100	100	Converted from Brinell Hardness Value
Hardness, Vickers	87	87	Converted from Brinell Hardness Value
Ultimate Tensile Strength	290 MPa	42000 psi	AA; Typical
Tensile Yield Strength	145 MPa	21000 psi	AA; Typical
Elongation at Break	22 %	22 %	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	
Notched Tensile Strength	269 MPa	39000 psi	2.5 cm width x 0.16 cm thick side-notched specimen, K_t = 17.
Ultimate Bearing Strength	552 MPa	80100 psi	Edge distance/pin diameter = 2.0
Bearing Yield Strength	248 MPa	36000 psi	Edge distance/pin diameter = 2.0

Poisson's Ratio	0.33	0.33	Estimated from trends in similar Al alloys.
Fatigue Strength	150 MPa	21800 psi	5 E+8 cycles unnotched R. R. Moore rotating beam
Machinability	30 %	30 %	0-100 Scale of Aluminum Alloys
Shear Modulus	26.4 GPa	3830 ksi	
Shear Strength	172 MPa	25000 psi	AA; Typical

Electrical Properties

Electrical Resistivity	5.98e-006 ohm-cm	5.98e-006 ohm-cm	AA; Typical at 68°F

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	810 BTU-in/hr-ft²-°F	AA; Typical at 77°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 are available for this material.