



Aluminum 1100-0

Categories:	Metal; Nonferrous Metal; Aluminum Alloy; 1000 Series Aluminum		
Material Notes:	This is a common commercial grade sold when "aluminum" is specified. As with other unalloyed aluminum grades, it is used where the intrinsic formability and corrosion resistance of aluminum is needed while high strength is not. Data points with the AA note have been provided by the Aluminum Association, Inc. and are NOT FOR DESIGN.		
Composition Notes:	The aluminum content for unalloyed aluminum not made by a refining process is the difference between 100.00% and the sum of all other analyzed metallic elements present in amounts of 0.010% of more each, expressed to the second decimal before determining the sum. For alloys and unalloyed aluminum not made by refining process, when the specified maximum limit is 0.XX, an observed value or a calculated value greater than 0.005 but less than 0.010% is rounded off and shown as "less than 0.01%".		
Key Words:	Composition information provided by the Aluminum Association and is not for design. Aluminum 1100-0; UNS A91100; ISO Al99.0Cu; NF A45 (France); CSA 990C (Canada); AA1100-O		
Physical Properties	Metric	English	Comments
Density	2.71 g/cc	0.0979 lb. / in ³	AA; Typical
Mechanical Properties	Metric	English	Comments
Hardness, Brinell	23	23	AA; Typical; 500 g. load; 10 mm ball.
Ultimate Tensile Strength	89.6 MPa	13000 psi	AA; Typical
Tensile Yield Strength	34.5 MPa	5000 psi	AA; Typical
Elongation at Break	35.00%	35.00%	AA; Typical
	@ Thickness 1.59 mm 45.00% @ Diameter 12.7 mm	@ Thickness .0625 mm 45.00% @ Diameter 0.500 mm	AA; Typical
Modulus of Elasticity	68.9GPa	10000 ksi	AA; Typical: Average of tension and compression. Compression modulus is about 2% greater than tensile modulus.
Notched Tensile Strength	90.0 MPa	131000 psi	2.5 cm width x 0.16 cm thick side-notched specimen, Kt = 17
Ultimate Bearing Strength	159 MPa	23100 psi	Edge distance/pin diameter = 2.0
Bearing Yield Strength	55.0 Mpa	7980 psi	Edge distance/pin diameter = 2.0
Poissons Ratio	0.33	0.33	
Fatigue Strength	34.5 MPa @# of cycles 5.00e+8	5000 psi @# of cycles 5.00e+8	Completely reversed stress; RR Moore machine/specimen
Machinability	10.00%	10.00%	0 - 100 Scale of Aluminum Alloys
Shear Modulus	26.0 GPa	3770 ksi	Calculated
Shear Strength	62.1 MPa	9000 psi	AA; Typical
Electrical Properties	Metric	English	Comments
Electrical Resistivity	0.00000299 ohm-cm @ Temperature 20.0 ° C	0.00000299 ohm-cm @ Temperature 68.0° F	AA; Typical
Thermal Properties	Metric	English	Comments
Heat of Fusion	390 J/g 23.6 μm/m-°C @Temp 20.0 -100 ° C	168 BTU/lb 13.1 μin/in-°F @ Temp 68.0 - 212 ° F	AA; Typical;
CTE, linear	25.5 μm/m-°C @Temp 20.0 - 300 ° C	14.2 μin/in-°F @ Temp 68.0 - 572 ° F	Average
Specific Heat Capacity	0.904 J/g-°C	0.216 BTU /lb-°F	
Thermal Conductivity	222W/m-K	1540 BTU-in/hr-ft ² -°F	AA; Typical at 77°F
Melting Point	643 - 657.2 °C	1190 - 1215 °F	AA; Typical range based on typical composition for wrought products 1/4 inch thickness or greater.
Solidus	643 °C	1190°F	AA; Typical
Liquidus	657.2°C	1215 °F	AA; Typical
Processing Properties	Metric	English	Comments
Annealing Temperature	343 °C	650 °F	
Material Components Properties	Metric	English	Comments
Aluminum, Al	>= 99.0 %	>= 99.0 %	
Beryllium, Be	<= 0.000800 %	<= 0.000800 %	Welding Electrode and filler wire only.
Copper, Cu	0.050 - 0.20 %	0.050 - 0.20 %	
Manganese, Mn	<= 0.050 %	<= 0.050 %	
Other, each	<= 0.050 %	<= 0.050 %	
Other, total	<= 0.15 %	<= 0.15 %	
Si+Fe	<= 0.95 %	<= 0.95 %	
Zinc, Zn	<= 0.10 %	<= 0.10 %	