

## Aluminum 3003-H14

**Categories:** [Metal](#); [Nonferrous Metal](#); [Aluminum Alloy](#); [3000 Series Aluminum Alloy](#)




**Material Notes:** Good weldability/formability and very good corrosion resistance lead to applications such as food and chemical handling, tanks, trim, litho sheet, pressure vessels, and piping.

Data points with the AA note have been provided by the Aluminum Association, Inc. and are NOT FOR DESIGN.

**Composition Notes:**

Composition information provided by the Aluminum Association and is not for design.

**Key Words:** UNS A93003; ISO AlMn1Cu; Aluminium 3003-H14; AA3003-H14

Physical Properties	Metric	English	Comments
Density	<a href="#">2.73</a> g/cc	<a href="#">0.0986</a> lb/in <sup>3</sup>	AA; Typical
Mechanical Properties	Metric	English	Comments
Hardness, Brinell	40	40	AA; Typical; 500 g load; 10 mm ball
Tensile Strength, Ultimate 	<a href="#">152</a> MPa	<a href="#">22000</a> psi	AA; Typical
	<a href="#">18.0</a> MPa @Temperature 400 °C	<a href="#">2610</a> psi @Temperature 752 °F	
	<a href="#">29.0</a> MPa @Temperature 300 °C	<a href="#">4210</a> psi @Temperature 572 °F	
	<a href="#">96.0</a> MPa @Temperature 200 °C	<a href="#">13900</a> psi @Temperature 392 °F	
	<a href="#">145</a> MPa @Temperature 100 °C	<a href="#">21000</a> psi @Temperature 212 °F	
	<a href="#">150</a> MPa @Temperature -30.0 °C	<a href="#">21800</a> psi @Temperature -22.0 °F	
	<a href="#">150</a> MPa @Temperature 25.0 °C	<a href="#">21800</a> psi @Temperature 77.0 °F	
	<a href="#">175</a> MPa @Temperature -100 °C	<a href="#">25400</a> psi @Temperature -148 °F	
	<a href="#">250</a> MPa @Temperature -200 °C	<a href="#">36300</a> psi @Temperature -328 °F	
	<a href="#">140 - 180</a> MPa @Thickness 0.229 - 25.4 mm	<a href="#">20300 - 26100</a> psi @Thickness 0.00900 - 1.00 in	
Tensile Strength, Yield 	<a href="#">145</a> MPa	<a href="#">21000</a> psi	AA; Typical
	<a href="#">12.0</a> MPa @Temperature 400 °C	<a href="#">1740</a> psi @Temperature 752 °F	
	<a href="#">17.0</a> MPa @Temperature 300 °C	<a href="#">2470</a> psi @Temperature 572 °F	
	<a href="#">62.0</a> MPa @Temperature 200 °C	<a href="#">8990</a> psi @Temperature 392 °F	
	<a href="#">130</a> MPa @Temperature 100 °C	<a href="#">18900</a> psi @Temperature 212 °F	
	<a href="#">145</a> MPa @Temperature -30.0 °C	<a href="#">21000</a> psi @Temperature -22.0 °F	
	<a href="#">145</a> MPa @Temperature 25.0 °C	<a href="#">21000</a> psi @Temperature 77.0 °F	
	<a href="#">155</a> MPa @Temperature -100 °C	<a href="#">22500</a> psi @Temperature -148 °F	
	<a href="#">170</a> MPa @Temperature -200 °C	<a href="#">24700</a> psi @Temperature -328 °F	
	>= <a href="#">115</a> MPa @Thickness 0.229 - 25.4 mm	>= <a href="#">16700</a> psi @Thickness 0.00900 - 1.00 in	
Elongation at Break 	16.0 % @Temperature -30.0 °C	16.0 % @Temperature -22.0 °F	
	16.0 % @Temperature 25.0 °C	16.0 % @Temperature 77.0 °F	
	16.0 % @Temperature 100 °C	16.0 % @Temperature 212 °F	
	19.0 %	19.0 %	



@Temperature -100 °C	20.0 %	@Temperature -148 °F	20.0 %	
@Temperature 200 °C	30.0 %	@Temperature 392 °F	30.0 %	
@Temperature -200 °C	70.0 %	@Temperature -328 °F	70.0 %	
@Temperature 300 °C	75.0 %	@Temperature 572 °F	75.0 %	
@Temperature 400 °C	1.00 - 10.0 %	@Temperature 752 °F	1.00 - 10.0 %	
@Thickness 0.229 - 25.4 mm	8.00 %	@Thickness 0.00900 - 1.00 in	8.00 %	AA; Typical
@Thickness 1.59 mm	16.0 %	@Thickness 0.0625 in	16.0 %	AA; Typical
@Diameter 12.7 mm	<a href="#">68.9</a> GPa	@Diameter 0.500 in	<a href="#">10000</a> ksi	

Modulus of Elasticity				AA; Typical; Average of tension and compression. Compression modulus is about 2% greater than tensile modulus.
Notched Tensile Strength	<a href="#">172</a> MPa	<a href="#">24900</a> psi		2.5 cm width x 0.16 cm thick side-notched specimen, K <sub>t</sub> = 17.
Ultimate Bearing Strength	<a href="#">241</a> MPa	<a href="#">35000</a> psi		Edge distance/pin diameter = 2.0
Bearing Yield Strength	<a href="#">193</a> MPa	<a href="#">28000</a> psi		Edge distance/pin diameter = 2.0
Poissons Ratio	0.330	0.330		
Fatigue Strength	<a href="#">62.1</a> MPa	<a href="#">9000</a> psi		completely reversed stress; RR Moore machine/specimen
Machinability	30 %	30 %		0-100 Scale of Aluminum Alloys
Shear Modulus	<a href="#">25.0</a> GPa	<a href="#">3630</a> ksi		
Shear Strength	<a href="#">96.5</a> MPa	<a href="#">14000</a> psi		AA; Typical

Electrical Properties	Metric	English	Comments
Electrical Resistivity	<a href="#">0.00000416</a> ohm-cm	<a href="#">0.00000416</a> ohm-cm	AA; Typical
Magnetic Susceptibility	8.00e-7	8.00e-7	cgs/g at 25°C

Thermal Properties	Metric	English	Comments
CTE, linear	<a href="#">21.5</a> µm/m-°C	<a href="#">11.9</a> µin/in-°F	
	@Temperature -50.0 - 20.0 °C	@Temperature -58.0 - 68.0 °F	
	<a href="#">23.2</a> µm/m-°C	<a href="#">12.9</a> µin/in-°F	
	@Temperature 20.0 - 100 °C	@Temperature 68.0 - 212 °F	
	<a href="#">23.2</a> µm/m-°C	<a href="#">12.9</a> µin/in-°F	AA; Typical; average over range
	@Temperature 20.0 - 100 °C	@Temperature 68.0 - 212 °F	
	<a href="#">24.1</a> µm/m-°C	<a href="#">13.4</a> µin/in-°F	
	@Temperature 20.0 - 200 °C	@Temperature 68.0 - 392 °F	
	<a href="#">25.1</a> µm/m-°C	<a href="#">13.9</a> µin/in-°F	
	@Temperature 20.0 - 300 °C	@Temperature 68.0 - 572 °F	
	<a href="#">25.1</a> µm/m-°C	<a href="#">13.9</a> µin/in-°F	average
	@Temperature 20.0 - 300 °C	@Temperature 68.0 - 572 °F	
Specific Heat Capacity	<a href="#">0.893</a> J/g-°C	<a href="#">0.213</a> BTU/lb-°F	
Thermal Conductivity	<a href="#">159</a> W/m-K	<a href="#">1100</a> BTU-in/hr-ft <sup>2</sup> -°F	AA; Typical at 77°F
Melting Point	<a href="#">643 - 654</a> °C	<a href="#">1190 - 1210</a> °F	AA; Typical range based on typical composition for wrought products 1/4 inch thickness or greater
Solidus	<a href="#">643</a> °C	<a href="#">1190</a> °F	AA; Typical
Liquidus	<a href="#">654</a> °C	<a href="#">1210</a> °F	AA; Typical

Processing Properties	Metric	English	Comments
Annealing Temperature	<a href="#">413</a> °C	<a href="#">775</a> °F	Commercial practice: 750 to 1100°F, higher temperatures used only for flash annealing.

Component Elements	Metric	English	Comments
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<b>Properties</b>			
Aluminum, Al	96.7 - 99.0 %	96.7 - 99.0 %	As remainder
Copper, Cu	0.050 - 0.20 %	0.050 - 0.20 %	
Iron, Fe	<= 0.70 %	<= 0.70 %	
Manganese, Mn	1.0 - 1.50 %	1.0 - 1.50 %	
Other, each	<= 0.050 %	<= 0.050 %	
Other, total	<= 0.15 %	<= 0.15 %	
Silicon, Si	<= 0.60 %	<= 0.60 %	
Zinc, Zn	<= 0.10 %	<= 0.10 %	

[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. We also ask that you refer to MatWeb's [terms of use](#) regarding this information. [Click here](#) to view all the property values for this datasheet as they were originally entered into MatWeb.