



ASM Aerospace Specification Metals Inc.



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## Aluminum 2014-T4; 2014-T451

**Subcategory:** 2000 Series Aluminum Alloy; Aluminum Alloy; Metal; Nonferrous Metal

### Close Analogs:

### Composition Notes:

A Zr + Ti limit of 0.20 percent maximum may be used with this alloy designation for extruded and forged products only, but only when the supplier or producer and the purchaser have mutually so agreed.

Agreement may be indicated, for example, by reference to a standard, by letter, by order note, or other means which allow the Zr + Ti limit.

Aluminum content reported is calculated as remainder.

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

**Key Words:** Aluminium 2014-T4; UNS A92014; ISO AlCu4SiMg; BS H15 (UK); CSA CS41N (Canada); AA2014-T4, Aluminium 2014-T451; DIN AlCuSiMn; NF A-U4SG (France); AA2014-T451

Component	Wt. %	Component	Wt. %	Component	Wt. %
Al	90.4 - 95	Mg	0.2 - 0.8	Si	0.5 - 1.2
Cr	Max 0.1	Mn	0.4 - 1.2	Ti	Max 0.15
Cu	3.9 - 5	Other, each	Max 0.05	Zn	Max 0.25
Fe	Max 0.7	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	<u>2.8 g/cc</u>	0.101 lb/in <sup>3</sup>	AA; Typical

### Mechanical Properties

Hardness, Brinell	105	105	AA; Typical; 500 g load; 10 mm ball
Hardness, Knoop	132	132	Converted from Brinell Hardness Value
Hardness, Rockwell A	42.8	42.8	Converted from Rockwell B
Hardness, Rockwell B	67	67	-

Hardness, Vickers	118	118	Converted from Brinell Hardness Value
Ultimate Tensile Strength	<u>427 MPa</u>	62000 psi	AA; Typical
Tensile Yield Strength	<u>290 MPa</u>	42000 psi	AA; Typical
Elongation at Break	<u>20 %</u>	20 %	AA; Typical; 1/2 in. (12.7 mm) Diameter
Modulus of Elasticity	<u>72.4 GPa</u>	10500 ksi	In Tension
Modulus of Elasticity	<u>73.1 GPa</u>	10600 ksi	AA; Typical; Average of tension and compression. Compression modulus is about 2% greater than tensile modulus.
Compressive Modulus	<u>73.8 GPa</u>	10700 ksi	
Poisson's Ratio	0.33	0.33	
Fatigue Strength	<u>262 MPa</u>	38000 psi	AA; 500,000,000 cycles completely reversed stress; RR Moore machine/specimen
Shear Modulus	<u>28 GPa</u>	4060 ksi	
Shear Strength	<u>262 MPa</u>	38000 psi	AA; Typical

### Electrical Properties

Electrical Resistivity	<u>5.15e-006 ohm-cm</u>	5.15e-006 ohm-cm	AA; Typical at 68°F
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### Thermal Properties

CTE, linear 68°F	<u>23 <math>\mu\text{m}/\text{m}\cdot\text{°C}</math></u>	12.8 $\mu\text{in}/\text{in}\cdot\text{°F}$	AA; Typical; Average over 68-212°F range.
CTE, linear 250°C	<u>24.4 <math>\mu\text{m}/\text{m}\cdot\text{°C}</math></u>	13.6 $\mu\text{in}/\text{in}\cdot\text{°F}$	Average over the range 20-300°C
Specific Heat Capacity	<u>0.88 J/g·°C</u>	0.21 BTU/lb·°F	Estimated from trends in similar Al alloys.
Thermal Conductivity	<u>134 W/m·K</u>	930 BTU-in/hr-ft <sup>2</sup> ·°F	AA; Typical at 77°F
Melting Point	507 - 638 °C	945 - 1180 °F	AA; Typical range based on typical composition for wrought products 1/4 inch thickness or greater. Eutectic melting is not eliminated by homogenization.
Solidus	<u>507 °C</u>	945 °F	AA; Typical
Liquidus	<u>638 °C</u>	1180 °F	AA; Typical

### Processing Properties

Annealing Temperature	<u>413 °C</u>	775 °F
Solution Temperature	<u>502 °C</u>	935 °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 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.