



ASM Aerospace Specification Metals Inc.



Contact Us

## Aluminum 2024-T81

**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 2024-T81; UNS A92024; ISO A1Cu4Mg1; NF A-U4G1 (France); DIN AlCuMg2; AA2024-T81, ASME SB211; CSA CG42 (Canada)

Component	Wt. %	Component	Wt. %	Component	Wt. %
Al	90.7 - 94.7	Mg	1.2 - 1.8	Si	Max 0.5
Cr	Max 0.1	Mn	0.3 - 0.9	Ti	Max 0.15
Cu	3.8 - 4.9	Other, each	Max 0.05	Zn	Max 0.25
Fe	Max 0.5	Other, total	Max 0.15		

### Material Notes:

Information provided by Alcoa and the references. General 2024 characteristics and uses: Good machinability and surface finish capabilities. A high strength material of adequate workability. Has largely superceded 2017 for structural applications.

**Uses:** Aircraft fittings, gears and shafts, bolts, clock parts, computer parts, couplings, fuse parts, hydraulic valve bodies, missile parts, munitions, nuts, pistons, rectifier parts, worm gears, fastening devices, veterinary and orthopedic equipment, structures.

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>2.78 g/cc</u>	0.1 lb/in <sup>3</sup>	AA; Typical

### Mechanical Properties

Hardness, Brinell	128	128	500 kg load with 10 mm ball
Hardness, Knoop	161	161	Converted from Brinell Hardness Value
Hardness, Rockwell A	48.9	48.9	Converted from Brinell Hardness Value
Hardness, Rockwell B	79	79	Converted from Brinell Hardness Value
Hardness, Vickers	146	146	Converted from Brinell Hardness Value
Tensile Strength, Ultimate	<u>485 MPa</u>	70300 psi	
Tensile Strength, Yield	<u>450 MPa</u>	65300 psi	
Elongation at Break	<u>2 %</u>	2 %	Foil
Elongation at Break	<u>6 %</u>	6 %	In 5 cm; Sample 1.6 mm thick
Modulus of Elasticity	<u>72.4 GPa</u>	10500 ksi	Average of Tension and Compression. In Aluminum alloys, the compressive modulus is typically 2% greater than the tensile modulus
Poisson's Ratio	0.33	0.33	
Fatigue Strength	<u>125 MPa</u>	18100 psi	500,000,000 Cycles
Shear Modulus	<u>28 GPa</u>	4060 ksi	
Shear Strength	<u>295 MPa</u>	42800 psi	

### Electrical Properties

Electrical Resistivity	<u>4.49e-006 ohm-cm</u>	4.49e-006 ohm-cm	AA; Typical at 68°F
------------------------	-------------------------	------------------	---------------------

### Thermal Properties

CTE, linear 68°F	<u>23.2 μm/m-°C</u>	12.9 μin/in-°F	AA; Typical; Average over 68-212°F range.
CTE, linear 250°C	<u>24.7 μm/m-°C</u>	13.7 μin/in-°F	Average over the range 20-300°C
Specific Heat Capacity	<u>0.875 J/g-°C</u>	0.209 BTU/lb-°F	
Thermal Conductivity	<u>151 W/m-K</u>	1050 BTU-in/hr-ft <sup>2</sup> -°F	AA; Typical at 77°F
Melting Point	502 - 638 °C	935 - 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>502 °C</u>	935 °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>256 °C</u>	493 °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.