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ASM Aerospace Specification Metals Inc.

Contact Us

Aluminum 2024-T4; 2024-T351

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-T351; AA2024-T351, Aluminium 2024-T4; UNS A92024; ISO AlCu4Mg1; NF A-U4G1 (France); DIN AlCuMg2; AA2024-T4, 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:
General 2024 characteristics and uses (from Alcoa): 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 Has largely superceded 2017 for structural applications.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	2.78 g/cc	0.1 lb/in³	AA; Typical

Mechanical Properties

Hardness, Brinell	120	120	AA; Typical; 500 g load; 10 mm ball
Hardness, Knoop	150	150	Converted from Brinell Hardness Value
Hardness, Rockwell A	46.8	46.8	Converted from Brinell Hardness Value
Hardness, Rockwell B	75	75	Converted from Brinell Hardness Value
Hardness, Vickers	137	137	Converted from Brinell Hardness Value
Ultimate Tensile Strength	469 MPa	68000 psi	AA; Typical
Tensile Yield Strength	324 MPa	47000 psi	AA; Typical
Elongation at Break	19 %	19 %	AA; Typical; 1/2 in. (12.7 mm) Diameter
Elongation at Break	20 %	20 %	AA; Typical; 1/16 in. (1.6 mm) Thickness
Modulus of Elasticity	73.1 GPa	10600 ksi	AA; Typical; Average of tension and compression. Compression modulus is about 2% greater than tensile modulus.
Ultimate Bearing Strength	814 MPa	118000 psi	Edge distance/pin diameter = 2.0
Bearing Yield Strength	441 MPa	64000 psi	Edge distance/pin diameter = 2.0
Poisson's Ratio	0.33	0.33	
Fatigue Strength	138 MPa	20000 psi	AA; 500,000,000 cycles completely reversed stress; RR Moore machine/specimen
Fracture Toughness	26 MPa-m½	23.7 ksi-in½	K(IC) in S-L Direction
Fracture Toughness	32 MPa-m½	29.1 ksi-in½	K(IC) in T-L Direction
Fracture Toughness	37 MPa-m½	33.7 ksi-in½	K(IC) in L-T Direction
Machinability	70 %	70 %	0-100 Scale of Aluminum Alloys
Shear Modulus	28 GPa	4060 ksi	
Shear Strength	283 MPa	41000 psi	AA; Typical

Electrical Properties

Electrical Resistivity	5.82e-006 ohm-cm	5.82e-006 ohm-cm	AA; Typical at 68°F

Thermal Properties

CTE, linear 68°F	23.2 µm/m-°C	12.9 µin/in-°F	AA; Typical; Average over 68-212°F range.
CTE, linear 250°C	24.7 µm/m-°C	13.7 µin/in-°F	Average over the range 20-300ºC
Specific Heat Capacity	0.875 J/g-°C	0.209 BTU/lb-°F	
Thermal Conductivity	121 W/m-K	840 BTU-in/hr-ft²-°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	502 °C	935 °F	AA; Typical
Liquidus	638 °C	1180 °F	AA; Typical

Processing Properties

Annealing Temperature	413 °C	775 °F
Solution Temperature	256 °C	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 consistant 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.