

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-O; UNS A92024; ISO AlCu4Mg1; NF A-U4G1 (France); DIN AlCuMg2; AA2024-O, ASME SB211; CSA CG42 (Canada)

Component	Wt. %	Component	Wt. %	Componer	nt 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 Has largely superceded 2017 for structural applications. Use of 2024-O not recommended unless subsequently heat treated.

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 ³	AA; Typical
Mechanical Properties			

Control LunceThe second se	Hardness, Brinell	47	47	AA; Typical; 500 g load; 10 mm ball
Tensile Yield StrengthZ5.8.MPa11000 psiAA; TypicalElongation at Break20.%20 %AA; Typical; 1/16 in. (1.6 mm) ThicknessElongation at Break22.%22 %AA; Typical; 1/2 in. (12.7 mm) DiameterModulus of ElasticityZ3.1 GPa10600 ksiAA; Typical; Average of tension and compression. Compression modulus is about 2% greater than tensile modulus.Ultimate Bearing Strength345 MPa50000 psiEdge distance/pin diameter = 2.0Bearing Yield Strength131 MPa19000 psiEdge distance/pin diameter = 2.0Poisson's Ratio0.330.33Fatigue Strength89.6 MPa13000 psiAA; 500,000,000 oycles completely reversed stress; R Moore machine/specimen Moore machine/specimen Moore machine/specimenAA; 500,000,000 oycles completely reversed stress; R Moore machine/specimen Moore machine/specimenMachinability30 %30 %0-100 Scale of Aluminum AlloysShear Modulus28 GPa4060 ksiElectrical Resistivity3.49e-006 ohm-cm3.49e-006 ohm-cmCTE, linear 68°F23.2 µm/m-°C12.9 µin/in-°FAA; Typical; Average over 68-212°F range.CTE, linear 250°C24.7 µm/m-°C13.7 µin/in-°FCTE, linear 250°C24.7 µm/m-°C0.209 BTU/h-°FThermal Conductivity193 W/m-K1340 BTU-in/h-r42-°FAA; Typical range based on typical composition for wrought products 1/4 indt hitchess or greater. Eutection melting is not eliminated by homogenization.Solidus502 °C935 ° FAA; Typical range based on typical comp				
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Electrical Resistivity3.49e-006 ohm-cm3.49e-006 ohm-cmAA; Typical at 68°FThermal PropertiesCTE, linear 68°F23.2 µm/m-°C12.9 µin/in-°FAA; Typical; Average over 68-212°F range.CTE, linear 250°C24.7 µm/m-°C13.7 µin/in-°FAverage over the range 20-300°CSpecific Heat Capacity0.875 J/g-°C0.209 BTU/lb-°FAverage over the range 20-300°CThermal Conductivity193 W/m-K 1340 BTU-in/hr-ft²-°FAA; Typical range based on typical at 77°FMelting Point502 - 638 °C935 - 1180 °FAA; Typical range based on typical composition for wrought products 1/4 inch thickness or greater. Eutectic melting is not eliminated by homogenization.Solidus502 °C935 °FAA; Typical	Shear Strength	<u>124 MPa</u>	18000 psi	AA; Typical
Thermal PropertiesCTE, linear 68°F23.2 µm/m-°C12.9 µin/in-°FAA; Typical; Average over 68-212°F range.CTE, linear 250°C24.7 µm/m-°C13.7 µin/in-°FAverage over the range 20-300°CSpecific Heat Capacity0.875 J/g-°C0.209 BTU/lb-°FAverage over the range 20-300°CThermal Conductivity193 W/m-K1340 BTU-in/hr-ft2-°FAA; Typical at 77°FMelting Point502 - 638 °C935 - 1180 °FAA; Typical range based on typical composition for wrought products 1/4 inch thickness or greater. Eutectic melting is not eliminated by homogenization.Solidus502 °C935 °FAA; Typical	Electrical Properties			
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CTE, linear 250°C24.7 µm/m-°C13.7 µin/in-°FAverage over the range 20-300°CSpecific Heat Capacity0.875 J/g-°C0.209 BTU/lb-°FThermal Conductivity193 W/m-K1340 BTU-in/hr-ft²-°FAA; Typical at 77°FMelting Point502 - 638 °C935 - 1180 °FAA; Typical range based on typical composition for wrought products 1/4 inch thickness or greater. Eutectic melting is not eliminated by homogenization.Solidus502 °C935 °FAA; Typical	Thermal Properties			
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Thermal Conductivity193 W/m-K1340 BTU-in/hr-ft2-°FAA; Typical at 77°FMelting Point502 - 638 °C935 - 1180 °FAA; Typical range based on typical composition for wrought products 1/4 inch thickness or greater. Eutectic melting is not eliminated by homogenization.Solidus502 °C935 °FAA; Typical	CTE, linear 250°C	<u>24.7 µm/m-°C</u>	13.7 μin/in-°F	Average over the range 20-300°C
Melting Point502 - 638 °C935 - 1180 °FAA; Typical range based on typical composition for wrought products 1/4 inch thickness or greater. Eutectic melting is not eliminated by homogenization.Solidus502 °C935 °FAA; Typical	Specific Heat Capacity	<u>0.875 J/g-°C</u>	0.209 BTU/lb-°F	
wrought products 1/4 inch thickness or greater. Eutectic melting is not eliminated by homogenization.Solidus502 °C935 °FAA; Typical	Thermal Conductivity	<u>193 W/m-K</u>	1340 BTU-in/hr-ft ² -°F	AA; Typical at 77°F
	Melting Point	502 - 638 °C	935 - 1180 °F	wrought products 1/4 inch thickness or greater. Eutectic
Liquidus <u>638 °C</u> 1180 °F AA; Typical	Solidus	<u>502 °C</u>	935 °F	AA; Typical
	Liquidus	<u>638 °C</u>	1180 °F	AA; Typical
Processing Properties	Processing Properties			
Annealing Temperature <u>413 °C</u> 775 °F	Annealing Temperature	<u>413 °C</u>	775 °F	
Solution Temperature <u>256 °C</u> 493 °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 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.