

Designation	AlCuMg2	EN AW-2024	UNS (ASTM) AA2024	DIN 3.1355	LMSA B710 / B720 ^[1]
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^[1] B720 reference after heat treatment

Chemical composition

Al	Cu	Mg	Mn	Si	Fe	Cr	Zn	Ti	Others*
Balance	3.80 - 4.90	1.20 - 1.80	0.30 - 0.90	≤ 0.50	≤ 0.50	≤ 0.10	≤ 0.25	≤ 0.15	≤ 0.15

Values (Weight %). In order to achieve maximum homogeneity and consistent quality, the actual manufacturing tolerances are tighter and more precisely than the composition indicated.

*Max 0.05% each.

Main technical properties and features

The unique properties of aluminum and its alloys make this material one of the most versatile, economical and attractive metallic materials on the market. After steel, aluminum alloys are the most widely used in structural applications. Aluminum is a lightweight material, with a density approximately three times lower than steel. In addition, thanks to a self-healing and nanometric layer of aluminum oxide formed on the surface, aluminum has good corrosion resistance to sea water, salt, and other environments.

AlCuMg2 is an aluminum alloy containing about 4 % copper and 1 % magnesium. This alloy has an excellent machinability, high strength, and is mainly used for structural applications. AlCuMg2 belongs to the series of aluminum that can be naturally aged or are suitable for precipitation hardening heat treatment, the main hardening phase is CuMgAl₂. The AlCuMg2 alloy has a medium corrosion resistance, lower than pure aluminum or aluminum alloys without copper in the composition. The presence of magnesium increases the mechanical strength but results in a higher sensitivity to weld cracking. This alloy has a mechanical strength in the work-hardened condition and a high strength in the heat-treated condition. The electrical conductivity of AlCuMg2 alloy is lower than that of pure aluminum (62 % IACS International Annealed Copper Standard) and is about 1/3 of that of pure copper, about 30 % IACS.

Lamineries MATTHEY offers AlCuMg2 in the form of precision thin strips and foils in various metallurgical tempers.

Typical uses

High strength applications, aeronautic and military industry, watch industry and loudspeaker, aircraft fuselage, etc.

Typical manufacturing range

	Thickness (mm)	Width (mm)	Length (mm)
Rolled products Strip in coils ^[1]	0.005 - 1.000	1.5 - 200.0	-
Strip as sheets ^[1]	0.005 - 1.500	10.0 - 200.0	100 - 3000

^[1] Not all our production possibilities are presented here. Other dimensions or product forms available upon request. Some combinations of thicknesses and widths are not possible.

Mechanical properties of strips

Temper	R _m (N/mm ²)	R _{p0.2} (N/mm ²)	A _{50mm} (%)	Hardness HV
annealed	190 - 250	60 - 160	8 min.	45 - 75
hard	280 - 380	200 min.	-	90 - 130

After heat treatment (**LMSA B720**)

Temper	R _m (N/mm ²)	R _{p0.2} (N/mm ²)	A _{50mm} (%)	Hardness HV
Heat treated	420 min.	270 min.	-	130 min.

Physical properties

Modulus of elasticity	kN/mm ²	73
Density	g/cm ³	2.77
Melting point	°C	640
Linear dilatation coefficient	10 ⁻⁶ ./ °C	22.9
Thermal conductivity at 20°C	W/m °K	190 (untreated) / 120 (temper T4)
Electrical resistivity	μΩcm	5.7
Electrical conductivity	MS/m	17.4
Electrical conductivity	% IACS	30
Magnetic properties		Non-magnetic

Heat treatment

AlCuMg2 (Avional 150) can be hardened by age hardening heat treatment:

Annealing temperature (°C)	Age hardening temperature (°C)	Age hardening time °C
350 - 500	150 - 200	6 - 16 hours

Solubilization temperature before hardening is close to the melting point temperature, followed by a precipitation hardening between 150 - 200 °C, function of the desired mechanical properties.

Tolerances (strip and foil)

Thickness	Thickness (mm)		EN Standard		Lamineries MATTHEY		
	≥	<	10140 Precision	10258 Precision	LMSA Standard	LMSA Precision	LMSA Extreme
<p>The table shown is an outline of our typical thickness tolerances available. They are tighter than industry standards.</p> <p>Our "LMSA Precision" and "LMSA Extreme" tolerances are available upon request.</p>	-	0.025	-	-	-	-	± 0.001
	0.025	0.050	-	-	± 0.003	± 0.002	± 0.0015
	0.050	0.065	-	± 0.003	± 0.003	± 0.0025	± 0.002
	0.065	0.100	-	± 0.004	± 0.004	± 0.0035	± 0.003
	0.100	0.125	± 0.005	± 0.006	± 0.005	± 0.004	± 0.003
	0.125	0.150	± 0.005	± 0.006	± 0.005	± 0.005	± 0.004
	0.150	0.250	± 0.010	± 0.008	± 0.008	± 0.006	± 0.004
	0.250	0.300	± 0.010	± 0.009	± 0.009	± 0.007	± 0.005
	0.300	0.400	± 0.010	± 0.010	± 0.010	± 0.007	± 0.005
	0.400	0.500	± 0.015	± 0.012	± 0.012	± 0.008	± 0.006
	0.500	0.600	± 0.015	± 0.014	± 0.014	± 0.010	± 0.007
	0.600	0.800	± 0.015	± 0.015	± 0.015	± 0.010	± 0.007
	0.800	1.000	± 0.015	± 0.018	± 0.018	± 0.012	± 0.009
	1.000	1.200	± 0.020	± 0.020	± 0.020	± 0.015	± 0.012
1.200	1.250	± 0.020	± 0.020	± 0.020	± 0.015	± 0.012	
1.250	1.500	± 0.020	± 0.020	± 0.020	± 0.015	± 0.014	
Width	Our width tolerances "Standard" is +0.2, -0.0 (or ± 0.1 mm upon request). They are available for slit widths < 125 mm and thicknesses < 1.00 mm. Special tolerances upon request.						
Camber	Width (mm)		Camber max. (mm/m)				
	>	≤	LMSA Standard		LMSA Extreme		
			≤ 0.5 mm	> 0.5 mm	≤ 0.5 mm	> 0.5 mm	
	3	6	12	-	6	-	
	6	10	8	10	4	5	
10	20	4	6	2	3		
20	250	2	3	1	1.5		
Surface	Special surface qualities upon request						
Flatness	Special requirement on the longitudinal or transversal flatness upon request						

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