
Aluminium 3004 Data Sheet

3004 Overview

Alloy 3004 is a non-heat treatable aluminium alloy from the wrought aluminium-manganese family supplied as sheet or coil. It has excellent corrosion resistance, medium strength and very good formability including drawing characteristics. 3004 has higher strength than 3003 but with lower ductility. 3004 is a common alloy that is considered a good general-purpose alloy.

3004 Mass Conversion Factor: Kilograms (kg) per mm per square metre = 2.72kg

Finishing

3004 may be supplied in mill finish, painted finish and stucco embossed finishes.

Common Applications

3004 is used in a diverse range of industries including building products for both internal and external, food and chemical, automotive, transport, HVAC, oil and gas, and architecture. Some specific applications include garage doors and acoustic ceilings, truck and trailer roofing, radiators since it is light and thermal conductive, fuel tanks and pressure vessels, façade panelling and signage.

Welding

3004 has excellent weldability by all standard methods especially with GMAW (MIG) and GTAW (TIG). Preferred filler is 1100 alloy though filler alloy 4043 and 5356 are most commonly utilised.

Machining

Machinability of the softer tempers of 3004 like O is poor, with the harder tempers such as H34 and above being easier to machine. Accuracy of machining is managed with high speeds, ample lubrication, sharp tools, positive rakes, adequate clearance and continuous cutting.

Chemical Composition Specification (%) Single values are maxima except as noted

Alloy	Si	Fe	Cu	Mn	Mg	Cr	Zn	Ti	Other	
									Each	Total
3003	0.6	0.7	0.05 - 0.20	1.0-1.5	-	-	0.10	-	0.05	0.15
3004	0.3	0.7	0.25	1.0-1.5	0.8-1.3	-	0.25	-	0.05	0.15

Mechanical Property Specification - Single values are maxima except as noted

Alloy and Temper	Thickness mm		Tensile Strength				Elongation (% min in 1.21 – 6.3mm)
	Over	Up to	Ultimate		Yield		
			Min	Max	Min	Max	
3003-O	1.2	6.3	95	130	35	-	25
3003-H14	1.2	6.3	140	180	115	-	5
3004-H34	1.2	6.3	220	265	170	-	4
5005-H14	1.2	6.3	145	185	115	-	3
5005-H34	1.2	6.3	140	180	105	-	5

Bend radii

Recommended Minimum Bend Radii for 90-Degree Cold Forming of Sheet of 3004 (Reference test method - ASTM E290) Thickness (t)

Temper	1.6mm	3.2mm	4.8mm	6.0mm	10mm
O	0t	½t	1t	1t	1t
H32	½t	1t	1t	1½t	1½t
H34	1t	1½t	1½t	2½t	2½t
H36	1½t	2½t	3t	3½t	4t
H38	2½t	3t	4t	5t	5½t

Bend radii listed are minimum recommendations only for bending sheets without fracture. Application method based on cold forming in a standard press brake with air bend dies. Alternative types of bending operations may require larger radii or smaller radii. Tooling quality and design may vary radii outcomes.

Material Specification & References

AS/NZS 1734:1997 Reconfirmed 2020 – Aluminium and aluminium alloys – Flat sheet, coiled sheet and plate

ASTM B209M - 14 – Aluminum and Aluminum Alloy Sheet and Plate

ASTM E290 – Bend Radii reference test method