
Aluminium 3003 Data Sheet

3003 Overview

Alloy 3003 is a non-heat treatable aluminium alloy from the wrought aluminium-manganese family supplied as sheet, coil or tread plate. It has excellent corrosion resistance, moderate strength and very good formability including drawing and spinning. 3003 can be cold worked to produce tempers with higher strength but lower ductility. 3003 is a common alloy that is considered a good general-purpose alloy. 3003 is available in both mill and bright finish, in flat and propeller pattern sheet and plate.

3003 Mass Conversion Factor: Kilograms (kg) per mm per square metre = 2.73kg

Finishing, Anodising and Painting

Harder temper 3003 H14 may show slight discolouration when anodising though reacts well to mechanical and organic finishes. 3003 is suitable for a variety of paint finishes. 3003 will be found in applications requiring moderate strength, good weldability and good formability even after optional surface treatments have been applied.

Common Applications

3003 can be used with 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

3003 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 3003 like O is poor, with the harder tempers such as H14 and above being better 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	0.05-0.2	1.0-1.5	-	-	0.1	-	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	1.21	6.3	95	130	35	-	25
3003-H14	1.21	6.3	140	180	115	-	5
3004-H34	1.21	6.3	220	265	170	-	4
5005-H14	0.8	6	145	185	115	-	2-6
5005-H34	0.8	6	135	180	105	-	4-7

Bend radii

Recommended Minimum Bend Radii for 90-Degree Cold Forming of Sheet of 3003 (Reference test method - ASTM E290) Thickness (t)

Temper	0.8mm	1.6mm	3.2mm	4.8mm	6.0mm
O	0t	0t	0t	½t	1t
H12	0t	0t	½t	1t	1t
H14	0t	0t	1t	1t	1½t
H16	1t	1t	1½t	2½t	3t
H18	1½t	2t	2½t	3½t	4½t

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 – Aluminum and Aluminum Alloy Sheet and Plate

ASTM E290 – Bend Radii reference test method