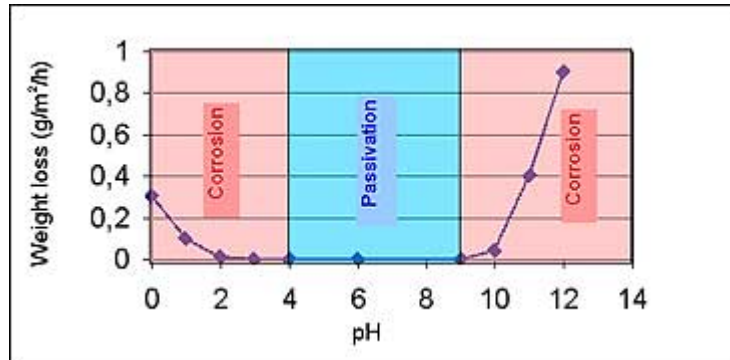


Corrosion Resistance The '1xxx' series alloys have the best resistance to general corrosion of all the aluminium alloys. Resistance is excellent in aqueous solutions in the pH range 4 – 9.



The corrosion resistance of aluminium alloys relies on a protective surface oxide film, which when damaged is readily repaired by the rapid reaction between aluminium and oxygen. However, the high reactivity of the base metal can give rapid corrosion if the film cannot be repaired, so aluminium alloys are not suitable for use with reducing media. Alloy 1100 can be anodised to improve the corrosion resistance by thickening the protective surface film.

Since aluminium is a reactive metal, it may corrode more quickly when in electrical contact with most other metals. The prediction of galvanic corrosion is complex; please consult Austral Wright Metals for specific advice.

Physical Properties

Property	At	value	unit	Property	at	Value	unit
Density	20°C	2,710	kg/m³	Mean Coefficient of Expansion	20°C	23.6	x 10 ⁻⁶ /°C
Weight	20°C	2.71 x thickness in mm		Thermal Conductivity	25°C	222	W / m . °C
Melting Range		643 – 657	°C	Electrical Resistivity	20°C	0.292	micro-ohm . m
Modulus of Elasticity				Electrical conductivity			
Tension	20°C	69	GPa	O temper (annealed)	20°C	59	% IACS
Torsion	20°C	26	GPa	H18 temper	20°C	57	% IACS

Fabrication Aluminium 1100 is very readily cold formable in the annealed condition, as it is ductile. Forming loads and tool & press wear are generally less than with carbon steel. For piercing and blanking the punch to die clearance should be about 5% of the thickness per side for temper O, 6% for H12 & H14.

Recommended minimum bend radii for cold forming at 90° to the rolling direction.

Temper	0.4 mm	0.8 mm	1.6 mm	3.0 mm
O	0 t	0 t	0 t	0 t
H12	0 t	0 t	0 t	½ t
H14	0 t	0 t	0 t	1 t

Summary of Characteristics

Corrosion resistance	Very good	Anodising	Very good
Formability	Excellent	Machinability	Poor
Weldability	Excellent	Brazeability	Excellent

t = material thickness

Welding Alloy 1100 is readily welded by the TIG and MIG processes. Commonly used filler alloys are 4043 and 1050. 4043 gives a greater weld strength, but if the assembly is to be anodized, 1050 filler metal will give a closer colour match.

1100 may also be gas welded or resistance welded, but the resulting joints are not as strong or as corrosion resistant as the inert gas welded joints. Gas welding could result in excessive heat distortion and thinner gauges may burn through. Aluminium must be very dry & clean to avoid contamination & porosity of the weld. It is essential that all traces of flux used in welding or brazing are removed by scrubbing with hot water.

Heat Treatment Alloy 1100 is annealed at 350°C, time at temperature and cooling rate are unimportant. Stress relief is rarely required, but can be carried out at about 220°C. If loss of strength is of concern, stress relief tests should be conducted.