

Aluminium Grade 5052 A95052

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.

Pressure Vessels AS1210 Pressure Vessels and AS4041 Pressure Piping prequalify the alloy for pressure service for temperatures up to 200°C.

Physical Properties

| Property | At | value | unit | Property | at | Value | unit |
|-----------------------|------|-----------|-------------------|-------------------------------|------|-------|-------------------------|
| Density | 20°C | 2,680 | kg/m ³ | Mean Coefficient of Expansion | 20°C | 23.75 | x 10 ⁻⁶ / °C |
| Melting Range | | 607 – 650 | °C | Thermal Conductivity | 25°C | 138 | W / m . °C |
| Modulus of Elasticity | | | | Electrical Resistivity | 20°C | 0.050 | micro-ohm . m |
| Tension | 20°C | 69.3 | GPa | Electrical conductivity | | | |
| Torsion | 20°C | 25.9 | GPa | equal volume | 20°C | 35 | % IACS |
| Compression | 20°C | 70.7 | GPa | equal weight | 20°C | 116 | % IACS |

Fabrication Aluminium 5052 is not generally hot worked. It 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 7% of the thickness per side for the H32 & H34 tempers. Sharp tools are required.

Indicative minimum bend radii for 90° cold forming for various thickness, t mm

| Temper | 0.4 | 0.8 | 1.6 | 3.2 | 4.8 | 6.4 | 9.5 | 13 |
|--------|-----|-----|------|------|------|------|------|-----|
| H32 | 0 t | 0 t | 1 t | 1½ t | 1½ t | 1½ t | 1½ t | 2 t |
| H34 | 0 t | 1 t | 1½ t | 2 t | 2 t | 2½ t | 2½ t | 3 t |

Machinability 5052 is readily machinable by conventional methods. It should be machined at high speed with copious lubrication to avoid thermal distortion of the workpiece. Sharp tools are essential. High speed steel or tungsten carbide may be used. Cuts should be deep and continuous, with high cutting speeds. Woodworking machinery may be suitable for short runs.

Welding 5052 is readily weldable by standard techniques. It is frequently welded with GTAW (TIG) or GMAW (MIG). Aluminium must be very dry & clean to avoid contamination & porosity of the weld. Filler metals 1100, 4043 or 4047 are used. 4043 is the most crack tolerant. Best colour match is obtained with 1188 filler metal. Shielding gas must be dry & free of hydrogen.

Heat Treatment Aluminium 5052 is annealed at 345°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.

| ASTM Product Specifications | Specification | Title |
|-----------------------------|---------------|--|
| | B209 | Aluminium and Aluminium Alloy Sheet and Plate |
| | B316 | Aluminium and Aluminium Alloy Rivet & Cold Heading Wire & Rods |
| | B210 | Aluminium and Aluminium Alloy Drawn Seamless Tubes |
| | B483 | Aluminium and Aluminium Alloy Drawn Tubes for General Purpose Applications |

Typical strength and ductility of alloys 5005 & 5052 in the H32 & H34 tempers

