

Grade 2011 aluminium is an age hardenable alloy noted for its free-machining characteristics and good mechanical properties. The 2011 alloy has a small addition of copper and lead that improve the strength and machinability respectively.

The free machining properties of the 2011 alloy allows the use of either carbide or high-speed tool steel tooling and makes it an ideal choice for use on intricate designs or for complex and detailed parts. It can also sometimes be machined using the same tooling as for free machining brass without the need for alteration. The material can also be cold formed by bending (but this is usually carried out prior to age hardening and the development of higher properties).

The drawback of the added strength and machinability is that the 2011 has a poor corrosion resistance. This means parts made from 2011 tend to be anodised to provide an additional surface protection (If higher levels of corrosion resistance are required, 6262 could be a suitable replacement). Further to this, welding is not recommended but as it is used mainly for machined parts there is rarely a need to weld this alloy.

Chemical Composition

Aluminium	Rem	Silicon	0.4 max
Copper	5.0 - 6.0	Iron	0.7 max
Bismuth	0.2 - 0.6	Zinc	0.3 max
Lead	0.2 - 0.6	Others	0.15 max

Related Specifications

2011	A92011	BS4300
BS FC1	DIN WS 3.1655	CB60
AlCu6BiPb	A-U5PbBi	AlCuBiPb

Key Features

- Excellent Machining Properties
- Good Anodising Capability
- Reasonable Strength Levels after heat treatment.

Typical Physical Properties

Melting Range	540-640°C
Density	2.83 g/cm ³
Thermal conductivity	163 W/m ² K
Thermal expansion coefficient	23 x 10 ⁻⁶
Electrical Conductivity	39.2 IACS
Electrical resistivity	0.044 microhm m
Modulus of elasticity	71 GPa

Fabrication Properties

Cold Formability	Fair
Machinability	Excellent
Soldering	Fair
Brazing	Poor
Oxy-acetylene welding	Poor
Gas-shielded arc welding	Poor
Resistance welding	Poor

Typical Applications

Often used for mass produced parts manufactured by repetition machining such as fasteners, appliance parts & trim, Automotive components and trim, screw machine products, atomizer and hose parts, pipe stems, and tube fittings.

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