

Aluminium Alloy 6063 & 6063A

Aluminium Alloy 6063

Aluminium alloy 6063 is a medium strength alloy commonly referred to as an architectural alloy. It is normally used in intricate extrusions.

It has a good surface finish, high corrosion resistance, is readily suited to welding and can be easily anodised. Most commonly available as T6 temper, in the T4 condition it has good formability.

Applications

6063 is typically used in:

- ◆ Architectural applications
- ◆ Extrusions
- ◆ Window frames
- ◆ Doors
- ◆ Shop fittings
- ◆ Irrigation tubing

In balustrading the rails and posts are normally in the T6 temper and formed elbows and bends are T4. T4 temper 6063 aluminium is also finding applications in hydroformed tube for chassis.

Aluminium Alloy 6063A

Aluminium alloy 6063A is a variation of 6063 with greater strength but retains the same good surface finish qualities and affinity for anodising.

Applications

6063A is used in the same applications as 6063. It is also used in:

- ◆ Road transport
- ◆ Rail transport
- ◆ Extreme sports equipment

Alloy Designations

Aluminium alloy 6063/6063A also corresponds to the following standard designations and specifications:

AA6063	Al Mg0.7Si
GS10	AlMgSi0.5
A-GS	3.32206
ASTM B210	ASTM B221
ASTM B241 (Pipe-Seamless)	ASTM B345 (Pipe-Seamless)
ASTM B361	ASTM B429
ASTM B483	ASTM B491
MIL G-18014	MIL G-18015
MIL P-25995	MIL W-85
QQ A-200/9	SAE J454
UNS A96063	HE19

Chemical Composition

Element	6063 % Present	6063A % Present
Si	0.2 to 0.6	0.3 to 0.6
Fe	0.35	0.15 to 0.35
Cu	0.1	0.1
Mn	0.1	0.15
Mg	0.45 to 0.9	0.6 to 0.9
Zn	0.1	0.15
Ti	0.1	0.1
Cr	0.1	0.05
Al	Balance	Balance

Temper

The most common tempers for 6063 aluminium are:

- ◆ Annealed wrought alloy
- ◆ T4 - Solution heat treated and naturally aged
- ◆ T6 - Solution heat treated and artificially aged



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All Data is indicative only and must not be seen as a substitute for the full specification from which it is drawn. In particular, the mechanical property requirements vary widely with temper, product form and product dimensions. For more complete details please refer to the relevant specification - The BS EN Specifications for aluminium are listed on a separate Datasheet.

6063 Mechanical Properties

Temper	O	T4	T6
Proof Stress 0.2% (MPa)	50	90	210
Tensile Strength (MPa)	100	160	245
Shear Strength (MPa)	70	110	150
Elongation A5 (%)	27	21	14
Hardness Vickers (HV)	85	50	80

6063A Mechanical Properties

Temper	T4	T6
Proof Stress 0.2% (MPa)	90	190
Tensile Strength (MPa)	150	230
Elongation A5 (%)	12	7

Physical Properties

Property	Value
Density	2.71 g/cm ³
Melting Point	600°C
Modulus of Elasticity	67 GPa
Electrical Resistivity	0.035x10 ⁻⁶ Ω.m
Thermal Conductivity	180 W/m.K
Thermal Expansion	23x10 ⁻⁶ /K

Fabrication

Process	Rating
Workability - Cold	Average
Machinability	Average
Weldability - Gas	Excellent
Weldability - Arc	Excellent
Weldability - Resistance	Excellent
Brazability	Excellent
Solderability	Good

Welding

6063 is suitable for all conventional welding methods.

Welding wire generally should be alloy 5183 or alloy 4043.

When maximum electrical conductivity is required use alloy 4043.

For strength and conductivity use alloy 5346 and increase the size of the weld to compensate for the lower conductivity.

Supplied Forms

6063 aluminium extrusions are available in the following forms with a T6 temper:

- ◆ Square Box Section
- ◆ Rectangular Box Section
- ◆ Channel
- ◆ Equal Angle
- ◆ Unequal Angle
- ◆ Flat Bar
- ◆ Tube

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