TECHNICAL DATA SHEET

Aluminium Alloy
6063 - T6 Extrusions

ORION ALLOYS

Description
Aluminum alloy 6063 is recognized as a medium-strength alloy, often referred to as an architectural alloy. It is typically employed in complex extrusion processes. This alloy boasts a fine surface finish, impressive corrosion resistance, suitability for welding, and is readily adaptable for anodizing. While it is most commonly available in the T6 temper, it also exhibits good formability when in the T4 condition.

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.

Aluminum alloy 6063A is a modified version of 6063, offering increased strength while preserving the same favorable surface finish characteristics and compatibility with anodizing processes.
6063A is used in the same applications as 6063 as well as road and rail transport and extreme sports equipment.

Chemical Composition
BS EN 573-3: 2009. Alloy 6063

Element	% Present
Magnesium (Mg)	0.45 - 0.90
Silicon (Si)	0.20 - 0.60
Iron (Fe)	0.0 - 0.35
Others (Total)	0.0 - 0.15
Chromium (Cr)	0.0 - 0.10
Copper (Cu)	0.0 - 0.10
Titanium (Ti)	0.0 - 0.10
Manganese (Mn)	0.0 - 0.10
Zinc (Zn)	0.0 - 0.10
Other (Each)	0.0 - 0.05
Aluminium (Al)	Balance

Designations
Aluminum alloy 6063/6063A can be associated with the following standard designations and specifications, though it may not be an exact equivalent:

- 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

Weldability
Alloy 6063 is compatible with all standard welding methods. When it comes to welding wire selection:

- For applications where maximum electrical conductivity is needed, alloy 4043 is the appropriate choice.
- To balance strength and conductivity, opt for alloy 5346. In such cases, you may need to increase the size of the weld to account for the lower conductivity.
- Both alloy 5183 and alloy 4043 are generally suitable for welding with alloy 6063.

Weldability, Gas:	Good
Weldability, Arc:	Very Good
Weldability, Resistance:	Good
Brazability:	Very Good
Solderability:	Good

Temper Types
The most common tempers for 6063 aluminium are O - Soft and T6 - Solution heat treated and artificially aged

Supplied Forms
Alloy 6063 is commonly supplied in the form of standard extrusions, which include tee, channel, angle, and flat bar, as well as box sections and tubes. It is available in the following forms: extrusions, tubes, bars, and rods.

Fabrication
Workability, Cold:	Average
Machinability:	Good

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Aluminium Alloy 6063 - T6 Extrusions

Mechanical Properties

BS EN 755-2. Tube. Up To 25mm Wall Thickness

Property	Value
Proof Stress	170 Min MPa
Tensile Strength	215 Min MPa
Elongation A50 mm	8 Min %
Hardness Brinell	75 HB
Elongation A	10 Min %

Details above refer to material in T6 condition.

To BS EN 755-2: 2008. Rod & Bar. Up To 150mm Dia. & A/F

Property	Value
Proof Stress	170 Min MPa
Tensile Strength	215 Min MPa
Elongation A50 mm	8 Min %
Hardness Brinell	75 HB
Elongation A	10 Min %

Details above refer to material in T6 condition.

To BS EN 755-2: 2008. Rod & Bar. 150mm to 200mm Dia. & A/F

Property	Value
Proof Stress	160 Min MPa
Tensile Strength	195 Min MPa
Hardness Brinell	75 HB
Elongation A	10 Min %

Details above refer to material in T6 condition.

Physical Properties

Property	Value
Density	2.70 g/cm^3
Melting Point	655 °C
Thermal Expansion	23.5 x10^{-6} /K
Modulus of Elasticity	69.5 GPa
Thermal Conductivity	201 W/m.K
Electrical Resistivity	52 % IACS
Electrical Resistivity	0.033 x10^{-6} Ω .m

BS EN 755-2:2008. Profiles. Up to 10mm Wall Thickness

Property	Value
Proof Stress	170 Min MPa
Tensile Strength	215 Min MPa
Elongation A50 mm	6 Min %
Hardness Brinell	75 HB
Elongation A	8 Min %

Details above refer to material in T6 condition.

BS EN 755-2:2008. Profiles. 10mm to 25mm Wall Thickness

Property	Value
Proof Stress	160 Min MPa
Tensile Strength	195 Min MPa
Elongation A50 mm	6 Min %
Hardness Brinell	75 HB
Elongation A	8 Min %

Details above refer to material in T6 condition.

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Disclaimer

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