

# Aluminium Alloy

## 6082 - T6 Extrusions

### Description

Aluminum alloy 6082 is a medium-strength alloy recognized for its exceptional resistance to corrosion. It stands as the highest-strength member within the 6000 series alloys. Alloy 6082 is primarily acknowledged as a structural alloy, and when in plate form, it is the most commonly used alloy for machining purposes. This relatively recent alloy has gained prominence due to its superior strength, often replacing 6061 in various applications. The substantial addition of manganese serves to control the grain structure, resulting in an even stronger alloy.

However, it's worth noting that producing thin-walled, complex extrusion shapes in alloy 6082 can be challenging. The surface finish of extrusions may not be as smooth as that of similar-strength alloys within the 6000 series.

In the T6 and T651 tempers, alloy 6082 displays good machinability, producing tightly coiled swarf when chip breakers are employed.

### Applications

Ore skips, Highly stressed applications, Cranes, Trusses, Milk churns, Bridges, Transport applications, Beer barrels

### Chemical Composition

BS EN 573-3:2009 - Alloy 6082

Element	% Present
Silicon (Si)	0.70 - 1.30
Magnesium (Mg)	0.60 - 1.20
Manganese (Mn)	0.40 - 1.00
Iron (Fe)	0.0 - 0.50
Chromium (Cr)	0.0 - 0.25
Zinc (Zn)	0.0 - 0.20
Others (Total)	0.0 - 0.15
Titanium (Ti)	0.0 - 0.10
Copper (Cu)	0.0 - 0.10
Other (Each)	0.0 - 0.05
Aluminium (Al)	Balance

### Weldability

Aluminum alloy 6082 exhibits excellent weldability, although the strength in the weld zone may decrease. When welding 6082 to itself, it is advisable to use alloy 4043 wire. However, if you are welding 6082 to 7005, it's recommended to use alloy 5356 wire.

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

### Temper Types

The most common tempers for 6082 aluminum include:

- T6: Achieved by solution heat treatment followed by artificial aging.
- O: Represents the softest temper.
- T4: Achieved by solution heat treatment and naturally aged to a substantially stable condition.
- T651: Achieved through solution heat treatment, stress relief by stretching, and subsequent artificial.

### Supplied Forms

Alloy 6082 is commonly available in various forms including channels, angles, tees, square bars, square box sections, rectangular box sections, flat bars, and tubes. It is typically supplied as extrusions, bars, and tubes.

### Fabrication

Workability, Cold:	Good
Machinability:	Good

### Physical Properties

Property	Value
Density	2.70 g/cm <sup>3</sup>
Melting Point	555 °C
Thermal Expansion	24 x10 <sup>-6</sup> /K
Modulus of Elasticity	70 GPa
Thermal Conductivity	180 W/m.K
Electrical Resistivity	0.038 x10 <sup>-6</sup> Ω .m

## Aluminium Alloy 6082 - T6 Extrusions

### Mechanical Properties

BS EN 755-2:2008. Rod & Bar. Up to 20mm Dia. & A/F

Property	Value
Proof Stress	250 Min MPa
Tensile Strength	295 Min MPa
Elongation A50 mm	6 Min %
Hardness Brinell	95 HB
Elongation A	8 Min %

Details above refer to material in T6 condition.

BS EN 755-2:2008. Tube. Up to 5mm Wall Thickness

Property	Value
Proof Stress	250 Min MPa
Tensile Strength	290 Min MPa
Elongation A50 mm	6 Min %
Hardness Brinell	95 HB
Elongation A	8 Min %

Details above refer to material in T6 condition.

BS EN 755-2:2008. Rod & Bar. 20mm to 150mm Dia. & A/F

Property	Value
Proof Stress	260 Min MPa
Tensile Strength	310 Min MPa
Hardness Brinell	95 HB
Elongation A	8 Min %

Details above refer to material in T6 condition.

BS EN 755-2:2008. Tube. 5mm to 25mm Wall Thickness

Property	Value
Proof Stress	260 Min MPa
Tensile Strength	310 Min MPa
Elongation A50 mm	8 Min %
Hardness Brinell	95 HB
Elongation A	10 Min %

Details above refer to material in T6 condition.

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

Property	Value
Proof Stress	240 Min MPa
Tensile Strength	280 Min MPa
Hardness Brinell	95 HB
Elongation A	6 Min %

Details above refer to material in T6 condition.

BS EN 755-2:2008. Open & Hollow Profile. Up To 5mm Wall Thickness

Property	Value
Proof Stress	250 Min MPa
Tensile Strength	290 Min MPa
Elongation A50 mm	6 Min %
Hardness Brinell	95 HB
Elongation A	8 Min %

Details above refer to material in T6 condition.

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

Property	Value
Proof Stress	240 Min MPa
Tensile Strength	280 Min MPa
Hardness Brinell	95 HB
Elongation A	6 Min %

Details above refer to material in T6 condition.

BS EN 755-2:2008. Open & Hollow Profile. Up To 5mm Wall Thickness

Property	Value
Proof Stress	250 Min MPa
Tensile Strength	290 Min MPa
Elongation A50 mm	6 Min %
Hardness Brinell	95 HB
Elongation A	8 Min %

Details above refer to material in T6 condition.



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#### **Disclaimer**

This data serves as an indicative reference and should not be used as a substitute for the full specification. Mechanical properties can vary significantly depending on the temper, product, and its dimensions. All the information provided is based on our current knowledge and is given in good faith. The company bears no responsibility for any actions taken by third parties based on this information.

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#### **Contact**

Tel: 01279 434422 • email: [enquiries@orionalloys.com](mailto:enquiries@orionalloys.com) • [www.orionalloys.com](http://www.orionalloys.com)

Orion Alloys Ltd, Unit A1, Riverway Industrial Estate, Riverway, Harlow, Essex, CM20 2DP