

Aluminium Alloy 6082

Aluminium alloy 6082 is a medium strength alloy with excellent corrosion resistance. It has the highest strength of the 6000 series alloys. Alloy 6082 is known as a structural alloy. In plate form, 6082 is the alloy most commonly used for machining. As a relatively new alloy, the higher strength of 6082 has seen it replace 6061 in many applications. The addition of a large amount of manganese controls the grain structure which in turn results in a stronger alloy.

It is difficult to produce thin walled, complicated extrusion shapes in alloy 6082. The extruded surface finish is not as smooth as other similar strength alloys in the 6000 series.

In the T6 and T651 temper, alloy 6082 machines well and produces tight coils of swarf when chip breakers are used.

Applications

6082 is typically used in:

- ◆ High stress applications
- ◆ Trusses
- ◆ Bridges
- ◆ Cranes
- ◆ Transport applications
- ◆ Ore skips
- ◆ Beer barrels
- ◆ Milk churns

Chemical Composition

Element	% Present
Si	0.7 to 1.3%
Fe	0.5%
Cu	0.1%
Mn	0.4 to 1.0%
Mg	0.6 to 1.2%
Zn	0.2%
Ti	0.1%
Cr	0.25%
Al	Balance

Mechanical Properties

Temper	O	T4	T6/T651
Proof Stress 0.2% (MPa)	60	170	310
Tensile Strength (MPa)	130	260	340
Shear Strength (MPa)	85	170	210
Elongation A5 (%)	27	19	11
Hardness Vickers (HV)	35	75	100

Physical Properties

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

Alloy Designations

Aluminium alloy 6082 also corresponds to the following standard designations and specifications:

AA6082	HE30
DIN 3.2315	EN AW-6082
ISO: Al Si1MgMn	A96082

Welding

6082 has very good weldability but strength is lowered in the weld zone. When welded to itself, alloy 4043 wire is recommended. If welding 6082 to 7005, then the wire used should be alloy 5356.



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Temper

The most common tempers for 6082 aluminium are:

- ◆ O – annealed wrought alloy
- ◆ T4 – Solution heat treated and naturally aged
- ◆ T6 – Solution heat treated and artificially aged
- ◆ T651 – Solution heat treated, stress relieved by stretching and then artificially aged

Fabrication

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

Supplied Forms

6082 aluminium is available in the following forms with a T6 temper:

- ◆ Square bar
- ◆ Square box section
- ◆ Rectangular box section
- ◆ Channel
- ◆ Tee section
- ◆ Equal angle
- ◆ Unequal angle
- ◆ Flat bar
- ◆ Tube
- ◆ Sheet

Plate and shate can also be supplied as 6082-T651.

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.

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