Aluminium Alloy 5083

Aluminium 5083 is known for exceptional performance in extreme environments. 5083 is highly resistant to attack by both seawater and industrial chemical environments.

Alloy 5083 also retains exceptional strength after welding. It has the highest strength of the non-heat treatable alloys but is not recommended for use in temperatures in excess of 65°C.

Applications

Alloy 5083 is typically used in:

- Shipbuilding
- Rail cars
- Vehicle bodies
- Tip truck bodies
- Mine skips and cages
- Pressure vessels

Chemical Composition

Element	% Present
Si	0.4%
Fe	0.4%
Cu	0.1%
Mn	0.4-1.0%
Mg	4.0-4.9%
Zn	0.25%
Ti	0.15%
Cr	0.05-0.25%
Al	Balance

Mechanical Properties

Temper	H32	0/H111
Proof Stress 0.2% (MPa)	240	145
Tensile Strength (MPa)	330	300
Shear Strength (MPa)	185	175
Elongation A5 (%)	17	23
Hardness Vickers (HV)	95	75

Alloy Designations

Alloy 5083 also corresponds to the following standard designations and specifications:

Al Mg4.5Mn0.7	AlMg4.5Mn
GM41	A95083

Physical Properties

Property	Value
Density	2.65 g/cm^3
Melting Point	570°C
Modulus of Elasticity	72 GPa
Electrical Resistivity	0.058x10^{-6} Ω.m
Thermal Conductivity	121 W/m.K
Thermal Expansion	25x10^{-6} /K

Temper

The most common tempers for 5083 aluminium are:

- 0 – Annealed wrought alloy
- H111 – Some work hardening imparted by shaping processes but less than required for a H11 temper.
- H32 – Work hardened and stabilised with a quarter hard temper.

Fabrication

Process	Rating
Workability – Cold	Average
Machinability	Poor
Weldability – Gas	Average
Weldability – Arc	Excellent
Weldability – Resistance	Excellent
Brazability	Poor
Solderability	Poor

Welding

When welding 5083 to itself or another alloy from the same sub-group, the recommended filler metal is 5183. Other suitable fillers are 5356 and 5556.

Supplied Forms

Alloy 5083 is generally supplied as a flat rolled product in plate form. ■

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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