



## Aluminium Alloy 5083-O H111

## Material Data Sheet

### Scope

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.

### Application

This material is used for pressure vessels, tip truck bodies, rail cars, ship building, vehicle bodies and mine skips & cages.

### Supplied Forms

- Sheet
- Plate

### Alloy Designations

Alloy 5083 also corresponds to: GM41, A95083, AlMg 4.5 Mn and Al Mg 4.5 Mn 0.7.

### Temper Types

The most common tempers for 5083 aluminium are: O - Soft, H111 - Some work hardening imparted by shaping processes but less than required for H11 temper and H32 - Work hardened by rolling then stabilised by low temperature heat treatment to quarter hard.

### Fabrication

- Solderability: Poor
- Weldability - Gas: Average
- Weldability - Arc: Excellent
- Weldability - Resistance: Excellent
- Brazability: Poor
- Workability - Cold: Average
- Machinability: 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.

### Chemical Composition

| Element        | % Present    |
|----------------|--------------|
| Manganese (Mn) | 0.40 - 1.00  |
| Iron (Fe)      | 0.40 Typical |
| Copper (Cu)    | 0.10 Typical |
| Magnesium (Mg) | 4.00 - 4.90  |
| Silicon (Si)   | 0.40 Typical |
| Zinc (Zn)      | 0.25 Typical |
| Chromium (Cr)  | 0.05 - 0.25  |
| Titanium (Ti)  | 0.15 Typical |
| Aluminium (Al) | Balance      |



### Mechanical properties at room temperature

| Property         | Value   |
|------------------|---------|
| Proof Strength   | 145 MPa |
| Tensile Strength | 300 MPa |
| Elongation       | 23 %    |
| Shear Strength   | 175 MPa |
| Hardness Vickers | 75 HV   |

Properties above are for material in the soft O/H111 condition.

### Reference data for some physical properties (for guidance only)

| Property               | Value                         |
|------------------------|-------------------------------|
| Density                | 2.65 Kg/m <sup>3</sup>        |
| Melting Point          | 570 °C                        |
| Thermal Expansion      | 25 x 10 <sup>-6</sup> /K      |
| Modulus of Elasticity  | 72 GPa                        |
| Thermal Conductivity   | 121 W/m.K                     |
| Electrical Resistivity | 0.058 x 10 <sup>-6</sup> Ω .m |

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### Important Note

Information given in this data sheet about the condition or usability of materials respectively products are no warranty for their properties, but act as a description.

The information, we give on for advice, comply to the experiences of the manufacturer as well as our own. We cannot give warranty for the results of processing and application of the products.