# trimal®-52

## Alloy for crash applications with maximum strength and excellent deformation capacity

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TRIMET Aluminium SE has revamped the **trimal®-52** (AlMgSi) alloy. The alloy from the 6xxx series is ideal for structural components that must exhibit best crash resistance properties and maximum levels of strength and corrosion resistance. It meets the high demands of standards in the automotive industry in every respect. This is not solely due to the fact that the **trimal®-52** alloy has been adapted to meet customer specifications.

Electrification of the automotive sector has seen demands for aluminium grow. It has become a substitute for steel, existing aluminium components are being optimized and completely new application areas are being created. The focus of these applications is on achieving as light a component operational weight as possible. The need for innovative alloys is expressed in demands for consistent strength requirements with reduced wall thicknesses combined with increasing demands regarding corrosion resistance and recyclability. Our wrought aluminium alloy based on the 6xxx series masters this balance of expectations.

### Chemical composition

The following table shows a reference analysis for the described material. Customer specifications may vary from this.

| % | Si | Fe | Cu | Mn | Mg | Cr |
|---|---|---|---|---|---|---|
| Min. | 0.65 | | | | 0.45 | |
| Max. | 1.10 | 0.25 | 0.25 | 0.80 | 0.90 | 0.20 |

| % | Zn | Ti | V | o.e. | o.t. | other |
|---|---|---|---|---|---|---|
| Min. | | | | | | Al |
| Max. | 0.15 | 0.10 | 0.20 | 0.05 | 0.15 | |

### Mechanical properties

The mechanical properties illustrated below are based on quasi-statistical tensile testing on flat specimens obtained from extruded profiles. These provide reference values for use of the alloy and may vary in individual application cases. T7 describes the condition following extrusion and artificial aging.

| Heat treatment condition | Yield strength Rp0.2 in MPa | Tensile strength Rm in MPa | Elongation at break A in % |
|---|---|---|---|
| T7 | ≥280 | ≥305 | ≥10 |

### Applications

Whereas first-generation profiles for crash applications exhibited mechanical strengths of between 180 MPa and 270 MPa, this new development enables the achievement of strengths exceeding 305 MPa. The yield strength was increased from 200 MPa to over 280 MPa. In addition to the need for excellent crash properties, increasing strength demands in the automotive industry also require intelligent alloy design. The **trimal®-52** alloy embodies excellent properties, with an elongation at break exceeding 10 percent. In addition, the material has good compression characteristics and can be recycled without difficulty. Profiles manufactured with **trimal®-52** can be produced cost-effectively in large quantities and combined thermally or mechanically with other materials (e.g. cast nodes). The alloy is particularly suitable for extruded profiles that conform to automotive OEM delivery specifications, particularly components that meet crash requirements and have a yield strength of 280-320 MPa.



**TRIMET Aluminium SE** • Aluminiumallee 1 • 45356 Essen
Telephone 0201-3660 • www.trimet.de

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