



trimal[®]-53

Alloy for crash applications
with high strength and excellent
deformation capacity

TRIMET is a member of the Aluminium Stewardship Initiative (ASI) and as an independent, family-run business with a long-term focus, makes an active contribution to the future development of ASI standards.



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Alloy for crash applications with high strength and excellent deformation capacity

The alloy **trimal[®]-53** (AlMgSi) is suitable for crash-relevant structural components with high strength and excellent deformation capacity. The wrought alloy from the 6xxx series is corrosion resistant and homogenized in a way that creates a microstructure with predominantly round structured phases. This also has a positive influence on the subsequent forming process. The alloy can be adapted to specific customer requirements.

Aluminium wrought alloys of the 6xxx series are established in automotive applications. They exhibit good strength and formability and are corrosion resistant. The alloy group is widely used in many application areas and can be easily recycled. The main alloying elements magnesium and silicon ensure the basic strength of these alloys. Other elements provide a finely grained structure and a comparatively benevolent quenching behavior.

Chemical composition

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

%	Si	Fe	Cu	Mn	Mg	Cr
Min.	0.45				0.45	
Max.	0.90	0.25	0.20	0.60	0.90	0.20

%	Zn	Ti	V	o.e.	o.t.	other
Min.						AL
Max.	0.15	0.10	0.20	0.03	0.1	

Mechanical properties

The mechanical properties shown below are based on quasi-static tensile tests using flat bar tension specimens taken from extruded profiles. The values are considered reference values for the use of this alloy and can vary in individual applications.

Temper	Yield strength Rp0.2, MPa	Tensile Strength Rm in MPa	Elongation A in %
T7	≥ 250	≥ 270	≥ 10

T7 describes the overaged condition after extrusion and artificial aging. Information on other heat treatment conditions can be provided on request.

Applications

The alloy achieves strengths up to ≥ 270 MPa. At this level of strength, reaching the required compression behavior represents a particular challenge. With an elongation of $\geq 10\%$, the alloy **trimal[®]-53** shows an excellent performance. In comparison to conventional alloys, higher component strengths can be achieved with the same wall thickness. The wall thickness of components can also be reduced while maintaining the same strength, thus reducing the weight of the component. This enables our customers to use **trimal[®]-53** for the most diverse dimensioning objectives. Structural components can be produced at low cost and thermally or mechanically joined with other materials, e.g. cast nodes. The alloy is particularly suitable for extruded profiles according to the delivery specifications of automotive OEMs, especially for components with crash requirements and a yield strength of 240-280 MPa.



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