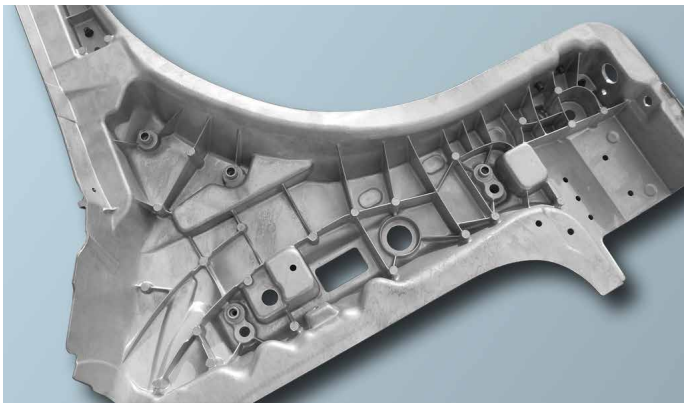

trimal®-05

High pressure die cast alloy for crash-relevant applications

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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trimal®-05

High pressure die cast alloy for crash-relevant applications

The **trimal®-05** (AlSi10MnMg) alloy is a low iron high pressure die cast alloy that was developed for die cast parts requiring high static and dynamic properties. The TRIMET Aluminium SE smelter in Essen, Germany produces the alloy from extremely pure metal, thus guaranteeing excellent mechanical properties and corrosion resistance. As a result, cast parts that are produced from **trimal®-05** can be installed without corrosion protection.

Due to a silicon content of about 10% by weight, castability is excellent. Parts with thin walls and numerous ribs can be cast without problems. The balanced ratio of iron to manganese minimizes the tendency of the part to stick to the die and increases the die life. The strength of the parts is regulated by adjusting the magnesium content.

trimal®-05 is a weldable alloy that can be used with all common welding methods. Combinations with extruded profiles or sheet metal are possible and applied. After appropriate heat treatment, elongation can reach over 15%.

Chemical composition

The following table shows a reference analysis for the described material in weight percent. **trimal®-05** can be delivered according to the EN AB-43500 standard, but customer specifications may vary.

%	Si	Fe	Cu	Mn	Mg	Zn	Ti	Sr*	o. e.	o. t.	Rest
Min.	9.50			0.4	0.10		0.03				
Max.	11.0	0.25	0.05	0.8	0.45	0.07	0.15	0.027	0.05	0.15	Al

**A permanent refinement with strontium is common practice.*

Mechanical properties

The following mechanical properties were determined using real parts and are considered to be reference values for the use of the alloy. Strength and elongation are regulated by adjusting the magnesium content, meaning a low magnesium content creates great elongation and medium strength while a high magnesium content results in great strength and medium elongation.

Temper	Yield Strength Rp0.2, MPa	Tensile Strength Rm, MPa	Elongation A %	Hardness HB
F	120–150	240–290	5–12	72–100
T5	160–220	280–320	4–10	85–110
T4	100–140	190–250	13–18	60–75
T6	200–270	290–350	6–13	85–110
T7	120–170	200–250	10–16	70–80

Applications

trimal®-05 is used for applications in which the static and dynamic properties of the part must meet the highest demands, for example structural parts, space frame nodes, motor mounts or casing pipes. Depending on the demands, **trimal®-05** cast parts can be delivered in the as-cast state or after an appropriate heat treatment.

Summary

> The alloy **trimal®-05** (AlSi10MnMg) was developed for crash-relevant die-cast parts with the highest demands on static and dynamic stress.
> The alloy has excellent castability.
> The cast components are highly corrosion-resistant and suitable for welding using all common methods.
> The strength and ductility of the parts can be adjusted via the Mg content and heat treatment.

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TRIMET Aluminium SE • Aluminiumallee 1 • D-45356 Essen
Tel. +49 201-3660 • www.trimet.de

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