

trimal[®]-37



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High pressure die cast alloy for ductile applications

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High pressure die cast alloy for ductile applications

The **trimal[®]-37** (AlSi9Mn) alloy was developed specially for the high pressure die casting process. In comparison to common die cast alloys, it has excellent ductility, which is evident from its high elongation and good energy absorption capability. As a result, **trimal[®]-37** is particularly suited for components that must exhibit high ductility without any or cost-intensive heat treatment.

trimal[®]-37 has excellent castability through the silicon content of about 9% and is thus ideally suited for casting complicated structures. The low iron content in **trimal[®]-37** prevents the formation of coarse intermetallic phases; manganese prevents sticking to the die. In the case of extremely large-scale structural parts, further measures can be taken against sticking. By refining with strontium, the structure of the eutectic silicon is so fine that it cannot be observed under a light-optical microscope even with a magnification of 1,000x.

The elements zircon and manganese create the necessary strength at room temperature and provide good heat stability at higher temperatures. The eutectic silicon can be globulized through short annealing that is performed below the blister temperature, thus increasing the ductility even further. The low magnesium content prevents the material from aging.

Chemical composition

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

%	Si	Fe	Cu	Mn	Mg	Zr	Zn
Min.	8.5			0.3		0.1	
Max.	10.5	0.15	0.05	0.6	0.08	0.3	0.05

%	Ti	Sr*	V	o. e.	o. t.	other
Min.		0.006	0.03			
Max.	0.15	0.027	0.1	0.05	0.2	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.

Temper	Young's modulus GPa	Yield strength Rp0.2, MPa	Tensile Strength Rm, MPa	Elongation A%	Hardness HB
F	65–75	120–140	250–290	8–15	80–90
O	65–75	100–120	200–240	10–18	65–75

Measured regions with a wall thickness of 2–3 mm.

Short- and longterm heat stability

Temper	Young's modulus GPa	Yield strength Rp0.2, MPa	Tensile Strength Rm, MPa	Elongation A%
205°C–60 min.	65	134	280	10
150°C–100 min.	65	135	250	11

Measured regions with a wall thickness of 2–3 mm. The alloy has been permanently refined with strontium.

Summary

trimal[®]-37 die cast alloy

- ... has excellent cast and die-filling behavior,
- ... can be easily removed from the die,
- ... has high heat stability,
- ... has high ductility in combination with , good strength,
- ... has good corrosion resistance,
- ... is weldable with all common welding methods.



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