



trimal[®]-41

High pressure die cast alloy for heat resistant applications

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trimal®-41

High pressure die cast alloy for heat resistant applications

trimal®-41 (AlSi9Cu3ZnMg) alloy is a low-iron die cast alloy that was developed for die cast parts requiring high static and dynamic properties, in particular at elevated temperatures. **trimal®-41** has excellent castability and allows for low-pore casting, even of parts with large variations in wall thicknesses.

The copper content of 3% makes the alloy heat resistant. Adding a zinc content of 2% enables the alloy to be hardened in eight days at room temperature. As a result, T5 heat treatment is not necessary, but can be performed if desired.

The manganese content of 0.8% prevents sticking to the die and provides temperature stability at the same time. By adding strontium to **trimal®-41**, the eutectic silicon is refined, thus improving ductility. In addition, strontium creates a slight spheroidizing of the intermetallic phases. The copper content limits the corrosion resistance.

Chemical composition

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

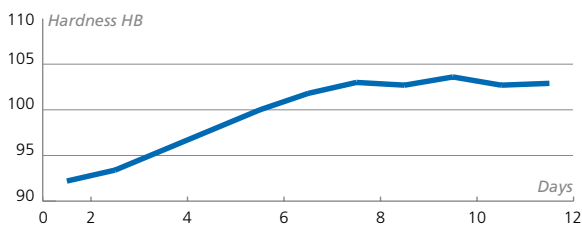
%	Si	Fe	Cu	Mn	Mg	Zn	Ti	o. t.
Min.	6.0		2.0	0.6	0.10	0.5	0.03	
Max.	11.0	0.4	4.0	1.0	0.55	3.5	0.12	0.2

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.

Duration of hardening at RT in days



Temper	Yield strength Rp0.2, N/m ²	Tensile Strength Rm, N/m ²	Elongation A%	Hardness HB
F	> 170	> 240	1–5	90–100
T5	> 180	> 250	> 1	95–115

Applications

trimal®-41 was developed specially for engine blocks. It is used mainly in applications such as engines or motor parts, casings or end plates that require great stability at, for example, elevated temperatures. The alloy can be used to cast complicated designs and very thin walls.

trimal®-41 is well machinable. It can be hard anodized to improve the tribologic properties.



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