

**Magsimal<sup>®</sup>**  
 Castasil<sup>®</sup>  
 Castadur<sup>®</sup>  
 Silafont<sup>®</sup>  
 Anticorodal<sup>®</sup>  
 Alufont<sup>®</sup>  
**Peraluman<sup>®</sup>**  
 Unifont<sup>®</sup>  
 Aluman<sup>®</sup>

# Letter to the foundrymen

October 2006

**Dear Foundryman,**

*since the introduction of Magsimal-59 by Aluminium Rheinfelden, this alloy family has established its place in the market with many innovative applications. Magsimal-59 is the high-pressure die-casting alloy of the AlMg5Si2Mn-type, which requires a special metallurgical treatment during manufacturing. Peraluman-07 is based on the same chemical composition as Magsimal-59 and is supplied with the proven protection against oxidation which is a significant advantage for the processing in the casting foundry. By performing additional metallurgical treatments, we produce the high-pressure die-casting alloys for higher requirements:*

**Magsimal<sup>®</sup>-33**  
**Magsimal<sup>®</sup>-59**

*These treatments lead to different microstructures. Peraluman-07 appears coarse, as shown in figure 1a below to the left. This structure provides lower mechanical properties, especially elongation values. The fine eutectic structure of Magsimal is shown in figure 1b.*

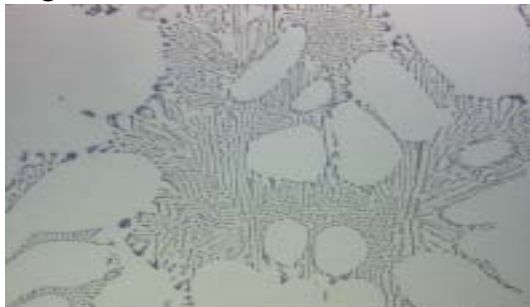


Fig. 1a: Microstructure of die-cast Peraluman<sup>®</sup>

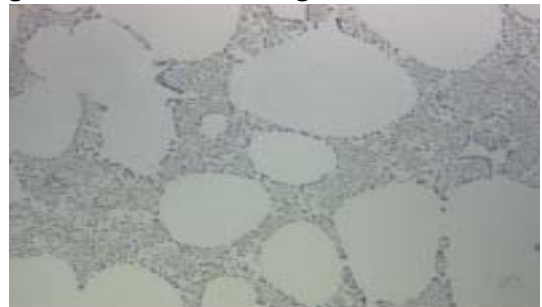


Fig. 1b: Microstructure of die-cast Magsimal<sup>®</sup>

**For parts with high-performance requirements and especially for crash relevant parts, Magsimal-33 and Magsimal-59 are particularly recommended.**

**Letter to the foundrymen: that's worth knowing!**

*Federico Casarotto*  
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# The advantages of these die-casting AlMg-alloys from Aluminium Rheinfelden

## Peraluman-07, AlMg5Si2Mn

### Applications of Pe-07

- Die-cast parts requiring good corrosion resistance
- Structural castings connected by adhesive bonding
- Rigid and highly-stressed supports and subframes
- Polished covers
- Castings for the optic industry
- Household appliances with highest corrosion requirements
- Connecting parts and supports for roof racks and screw-in parts

### Advantages of Pe-07

- Apply in the as-cast state (Temper F)
- High form strength
- High thermal shock resistance
- Very good weldability
- Excellent bonding behaviour
- Excellent polishing ability
- Excellent corrosion resistance
- Superior castability compared to the standard AlMg9-alloys, due to the 55% eutectic in the microstructure

## Magsimal-33, AlMg5Si2Mn

### Applications of Ma-33

All applications of Pe-07, plus the following:

- Nodes for car seat- and door-frames
- Steering-wheels with steel inserts
- Oil pans
- Welded structural castings

### Advantages of Ma-33

The same of Pe-07. Furthermore:

- Better plastic deformability
- Better ductility

## Magsimal-59, AlMg5Si2Mn

### Applications of Ma-59

All applications of Ma-33, plus applications requiring the highest performances:

- Dynamically stressed suspension parts for race and series cars
- Wheels, also for motorbikes
- Applications in the interior of air crafts
- Cast mono aluminium steering wheels

### Advantages of Ma-59

The same of Ma-33. Furthermore:

The finer microstructure of Ma-59 improves the dynamic resistance. In this way, with 5% probability to fracture and  $r = -1$ , the fatigue strength is more than 100 MPa.

Thickness [mm]	Yield strenght $R_{p0,2}$ [MPa]	Ultimate tensile strength $R_m$ [MPa]	Elongation A [%]	Alloys
2 – 4	160 – 200	300 – 350	6 – 13	Peraluman-07
4 – 6	130 – 170	250 – 320	4 – 11	Peraluman-07
2 – 4	160 – 200	300 – 350	11 – 17	Magsimal-33
4 – 6	130 – 170	250 – 320	8 – 13	Magsimal-33
2 – 4	160 – 220	310 – 350	12 – 18	Magsimal-59
4 – 6	140 – 170	250 – 320	9 – 14	Magsimal-59

Tab. 1: Mechanical properties of Pe-07, Ma-33 and Ma-59 in the as-cast state. The values refers to test plates and test samples cast in a single cavity die.



Fig.2: Nodes for a door window frame  
Courtesy Audi A4.



Fig.3: Front suspension in Magsimal®  
Courtesy Porsche Cayman