Magsimal®-59

Of filigree lightness, but extremely resilient

Ductile HPDC alloy with excellent mechanical and dynamic properties of thin wall thicknesses at as cast state F.

Excellent mechanical properties are achieved already at as cast state F:

<table>
<thead>
<tr>
<th>Wall thickness</th>
<th>0.2% YTS</th>
<th>UTS</th>
<th>Elongation A</th>
</tr>
</thead>
<tbody>
<tr>
<td>2 - 4 mm:</td>
<td>160 - 220 MPa</td>
<td>310 - 340 MPa</td>
<td>12 - 18%</td>
</tr>
<tr>
<td>4 - 6 mm:</td>
<td>140 - 170 MPa</td>
<td>250 - 320 MPa</td>
<td>9 - 14%</td>
</tr>
<tr>
<td>6 - 12 mm:</td>
<td>120 - 145 MPa</td>
<td>220 - 260 MPa</td>
<td>8 - 12%</td>
</tr>
</tbody>
</table>

- Superior dynamic properties.
  Very high fatigue strength = bending fatigue strength 5% = 100 MPa.
- No T5, T4, T6 and T7 heat treatment required.
  Additional costs for heat treatment of a usual AlSi10Mg alloy could be saved.
- No blistering and no distortions on casted parts.
  Costly straightening processes after a heat treatment can be avoided.

- Advanced application range for die casting work pieces in the as cast state F.
- Very suitable for applications in vehicle constructions.
  Excellent energy absorption capacity in the event of a vehicle crash is given.
- Substitution of complex steel sheet constructions in vehicle construction is possible.
  Significant cost and weight reductions are realizable.
- Substitution of aluminium forgings and magnesium HPDC in vehicle construction is representable.
  Cost reduction potentials through less costly die casting processes, elimination of potential corrosion problems.
- Very good castable HPDC alloy for thin-walled castings from 2.0 mm wall thickness.
- Excellent machinable and weldable.
- Excellent corrosion resistance: Coatings are often unnecessary.
- Excellent resistance to sea water atmosphere.
- Excellent resistance to stress corrosion cracking.
- Well suitable for self-riveted joints, clinched joints, crimped joints and adhesive bonds.

- Further increase in ductility by up to 20% by single-stage heat treatment is possible:
  (depending on the quality of cast pieces and cast parts wall thickness)
  State O = annealing 350 °C to 380 °C / 30 Min.
- Increasing the strength (yield strength) by up to 40% by T5 heat treatment is representable:
  (depending on the quality of cast pieces and cast parts wall thickness)
  State T5 = water quenching / annealing 250 °C / 60 Min.
DISCLAIMER:

All the details in this publication have been checked and are provided to the best of our knowledge. But just like all technical recommendations for applications, they are not binding, are not covered by our contractual obligations (this also applies to copyrights of third parties) and we do not assume liability for them. In particular they are not promises of characteristics and do not exempt the user from checking the products we supply for suitability for their intended purpose.
Reprints, translations and copies, including extracts, require our express approval.
New alloy developments made as technology progresses after printing are included in later versions.

Version 2016-01

IMPRINT:

RHEINFELDEN ALLOYS GmbH & Co. KG
A member of the ALUMINIUM RHEINFELDEN GROUP
Friedrichstrasse 80
Postfach 1703
79618 Rheinfelden

District Court: Freiburg i. Br., HRA 701166

Represented by general partner:
RHEINFELDEN ALLOYS Verwaltungs-GmbH
District Court of Freiburg i. Br., HRB 702560

Represented by Managing Director:
Dr. Alois J. Franke

VAT ID: DE815002074