Magsimal®-plus **High-Tech aluminium HPDC alloy for Light Weight Design in Automotive Structural Application**

HPDC alloy with very high mechanical and extraordinary high dynamic properties within thin wall design in the as cast state.

Mechanical properties in the as cast state F:

<table>
<thead>
<tr>
<th>Wall thickness</th>
<th>YTS R\textsubscript{p0.2}</th>
<th>UTS R\textsubscript{m}</th>
<th>Elongation A</th>
</tr>
</thead>
<tbody>
<tr>
<td>2 - 4 mm</td>
<td>190 - 230 MPa</td>
<td>310 - 355 MPa</td>
<td>8 - 13%</td>
</tr>
<tr>
<td>4 - 6 mm</td>
<td>160 - 200 MPa</td>
<td>280 - 340 MPa</td>
<td>9 - 14%</td>
</tr>
</tbody>
</table>

Mechanical properties in temper T5:

<table>
<thead>
<tr>
<th>Wall thickness</th>
<th>YTS R\textsubscript{p0.2}</th>
<th>UTS R\textsubscript{m}</th>
<th>Elongation A</th>
</tr>
</thead>
<tbody>
<tr>
<td>2 - 4 mm</td>
<td>210 - 245 MPa</td>
<td>320 - 370 MPa</td>
<td>8 - 12%</td>
</tr>
<tr>
<td>4 - 6 mm</td>
<td>180 - 225 MPa</td>
<td>300 - 360 MPa</td>
<td>9 - 13%</td>
</tr>
</tbody>
</table>

- Magsimal®-plus is an AlMg high pressure die casting alloy with excellent mechanical properties for structural parts in the BIW of vehicles.
- The high strength of Magsimal®-plus enables very thin lightweight designs. A weight reduction up to 40% in comparison to an AlSi10MnMg design may be achieved.
- No T6 or T7 heat treatment required:
  Cost cutting is possible due weight reduction of the cast and due skipping heat treatment and straightening after heat treatment’s distortion.
- **Excellent resistance to sea water atmosphere.**
  Protective coatings are often unnecessary.

- Advanced application range for casts in the as cast state F.
- **Very suitable for applications in vehicle designs:**
  Excellent energy absorption capacity in the event of a vehicle crash or impact to battery trays and covers,
- **Substitution of complex steel sheet designs in vehicle designs is possible.**
- **Substitution of aluminium forgings in vehicle designs is possible.**
- **Excellent weldable,** with welding technique similar to 5xxx-series.
- **Well suitable for self-piercing riveting, clinched joints and adhesive bonds.**
- **Very high resistance to stress corrosion cracking.**
- The casting of Magsimal-plus requires special know-how in the field of die design, melting and casting technique.
The composition of the alloy Magsimal-plus is patented by RHEINFELDEN ALLOYS GmbH & Co. KG

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