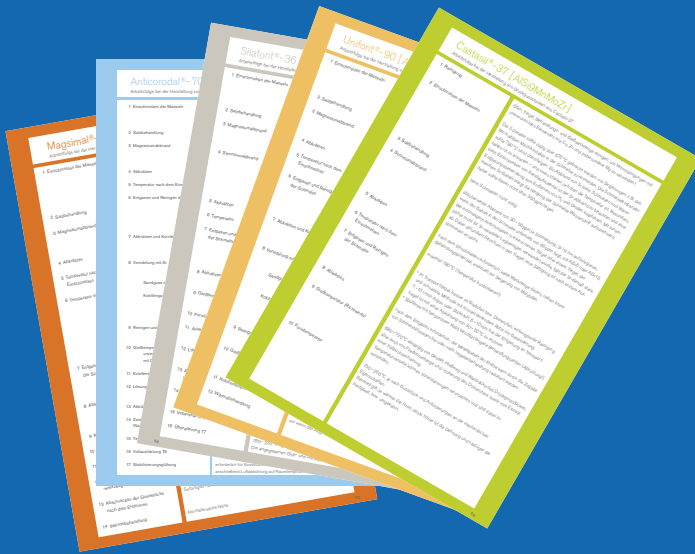


Processing data sheets



RHEINFELDEN ALLOYS provides the following processing data sheets in order to detail how to work with the various alloys. If you use our casting alloys, please feel free to copy the following pages and use them in your company. They contain practical instructions and demonstrate the processes step by step.

Not all alloys are listed here, but the processing data sheet from within the corresponding alloy family can be used, Peraluman-56 can for example also be used for Peraluman-30.

The recommendations correspond to typical foundry circumstances. For example a crucible or shaft melting furnace is considered for melting down; the circumstances in a huge melting furnace may differ from the recommendations. Fine returns should also not be used for primary aluminium high pressure die casting alloys.

The volumes listed here are all percentages by weight, calculated for the charge weight. The temperatures quoted all relate to the temperature of melt, even for casting. The heat treatment recommendations apply for the standard process and may be varied, to minimise distortion for example.

If you have any questions relating to your specific alloy application and processing, please contact our foundry experts.

1 Refining

Clean furnace, crucible, treatment and casting tools to avoid impurities from unwanted elements such as Cu, Zn and especially Mg!

2 Melting down the ingots

The melt should be quickly heated to above 670 °C to avoid segregations, e.g. of the solid solution containing Mn in the melt. The temperature of melt should not exceed 780 °C. An Sr melting loss should be expected when melting and keeping warm – the higher the temperature, the greater the loss, Sr melting loss should be expected in particular when melting down returns and degassing treatment is recommended to remove the H₂ and oxides. As the Sr content increases, so does the tendency for the melt to absorb hydrogen; this should not therefore exceed 350 ppm

3 Salt treatment

Not needed when melting

4 Strontium burnout

Usually melting loss of 30–50 ppm per fusion; Sr should only be added if the Sr content of the melts is less than 60 ppm, add AlSr5 or AlSr10. When fusing for the first time in a new crucible or in a crucible which has not yet been used for Sr-modified alloys, the Sr content falls sharply. Strontium will diffuse into the crucible; saturation is reached after the first fusion

5 Skimming

Needed after melting down; as well as their potential for danger, cold tools may result in molybdenum segregation

6 Temperature after melting down

After melting down maximum of 780 °C for holding temperature. Don't keep the melt at temperature below 680 °C and steer melt if possible

7 Degassing and refining the melts

- In the transport crucible, better in casting or dosing furnace; effective refining and fastest method using quick-running rotor for gas feeding, 7–10 l/min argon or nitrogen, 6–10 min; during degassing in the transport crucible, cooling of 30–50 °C should be expected
- Gas flushing lance with fine porous head, needs longer treatment times (cooling!)

8 Skimming

Required after degassing; the metal content of the skimmings may be reduced by adding melt fluxes after impeller treatment

9 Pouring temperature (approx. values)

680–720 °C depends on design, flow path and wall thickness of high pressure die casting, but also on the length and insulation of the flow channel in the dosing furnace and on use of shot sleeve heating. Temperature losses may cause initial solidification and should therefore be avoided

10 Mould temperature

200–300 °C, depending on casting and requirements of mechanical properties
As a rule: the warmer the mould, the higher the elongation and the lower the strength.

11 Die and chamber temperature

Die surface temperature between 250 and 350 °C, depends on casting size and wall thickness.
Preheat the chamber electrical or with oil >200 °C

We would like to thank all our business partners who have provided castings or photographs for this publication.

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.



RHEINFELDEN ALLOYS GmbH & Co. KG

A company of the ALUMINIUM RHEINFELDEN group

Sales and Customer Support

Friedrichstraße 80

D-79618 Rheinfelden

Tel. +49.7623.93-490

Fax +49.7623.93-546

alloys@rheinfelden-alloys.eu

www.rheinfelden-alloys.eu

