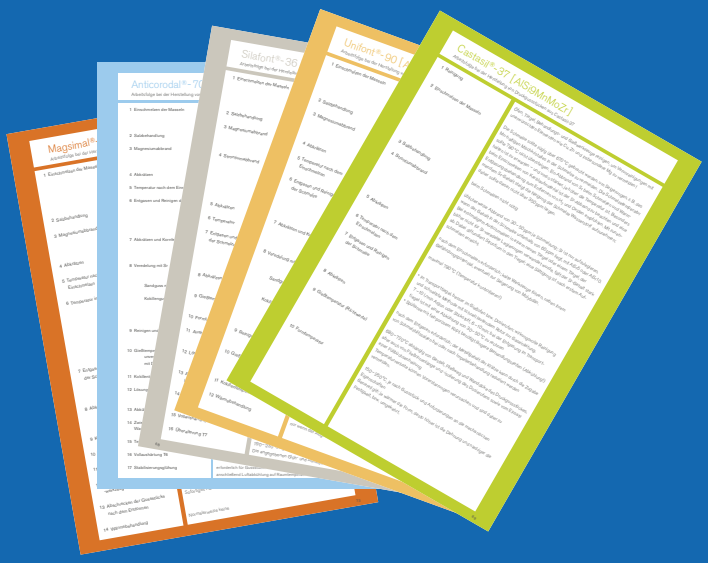
# Processing data sheets



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.

# Silafont®-38 [AlSi9MnMgZn]

Sequence of work when producing high pressure die castings from Silafont-38

| | |
|---|---|
| 1 Melting down the ingots | As quickly as possible in efficient furnaces to keep magnesium melting loss, gas absorption and oxidation of melts low; replenish preheated ingots and returns in small volumes to avoid segregation and entrapped oxides; proportion of returns may extend to 50 % |
| 2 Salt treatment | Not needed when melting |
| 3 Magnesium burnout | Normally a melting loss of 0.03 % per fusion; compensation is only required if the magnesium content of the melts is outside tolerance, add magnesium master alloy or pure magnesium |
| 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 80 ppm, add AlSr5 or AlSr10.<br>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 |
| 6 Temperature | After melting down maximum of 780 °C for holding temperature |
| 7 Degassing and refining the melts | • In the transport crucible, better in a holding crucible or receptacle or in a dosing furnace with bottom blocks; effective refining and fastest method using quick-running rotor for gas feeding, 7 – 10 l/min argon or nitrogen, 6 – 10 min<br>• Gas flushing lance with fine porous head, needs longer treatment times (cooling!)<br>• Gas flushing tablets emitting nitrogen in the bell plunger procedure are not very suitable |
| 8 Skimming | Required after melting down; the metal content of the skimmings may be reduced by adding melt fluxes within or after the impeller treatment |
| 9 Pouring temperature (approx. values) | 680 – 710 °C – depends on design, flow path and wall thickness of high pressure die casting, but also on the length of the flow channel in the dosing furnace and possibly on chamber heating |
| 10 Mould temperature | Die surface temperature 250 – 350 °C |
| 11 Solution heat treatment | 480 – 490 °C / 2 – 3 hours; for special components: 400 °C / 0.5 hours |
| 12 Cooling with air | Immediate air cooling with a cooling rate of > 4 °C/s is only achieved with an intensive air stream (down to 200 °C) and results in lower distorsion. If cooling in the air, only a significantly lower yield tensile strength can be obtained |
| 13 Cooling with water | In water (10 – 60 °C) without a delay wherever possible |
| 14 Delay time before artificial ageing | Only if dressing is needed, usually maximum of 12 hours |
| 15 Full artificial ageing T6 | 155 – 170 °C / 2 – 3 hours<br><br>The annealing and ageing times stated apply without a heating-up time |

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



Version 8 – 06/2015

GRUPPE DREI | 062015

RHEINFELDEN
Solutions thru Innovation

**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