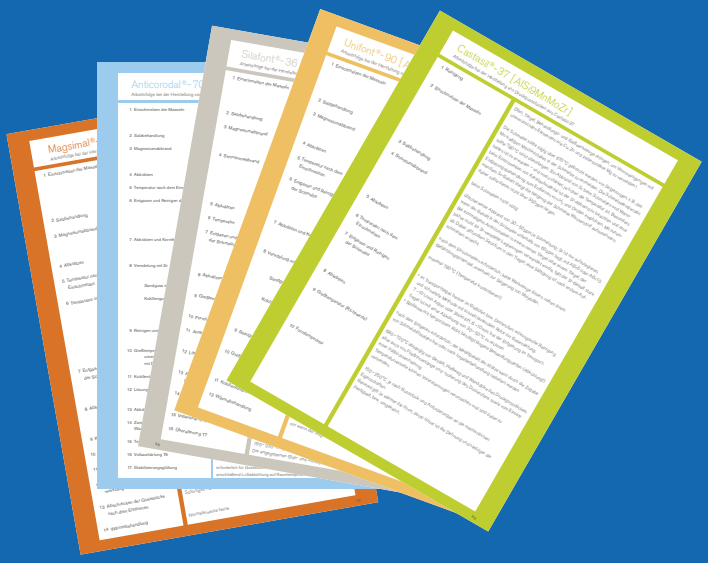
Processing data sheets



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.

Castasil®-21 [AlSi9Sr]

Sequence of work when producing high pressure die castings from Castasil-21

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 H_2 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!) • Tablets for melt cleaning are less efficient
8 Skimming	Required after degassing; the metal content of the skimmings may be reduced by adding melt fluxes during or 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 from the dosing furnace and on use of shot sleeve heating. Temperature losses may cause initial solidification and should therefore be avoided
10 Mould and chamber temperature	250 – 350 °C, depending on cast and requirements of mechanical properties As a rule: the warmer the mould, the higher the elongation and the lower the strength. Preheat the chamber electrical or with oil > 200 °C
11 Annealing to high conductivity by T5	250 – 350 °C / 2 – 3 hours 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

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