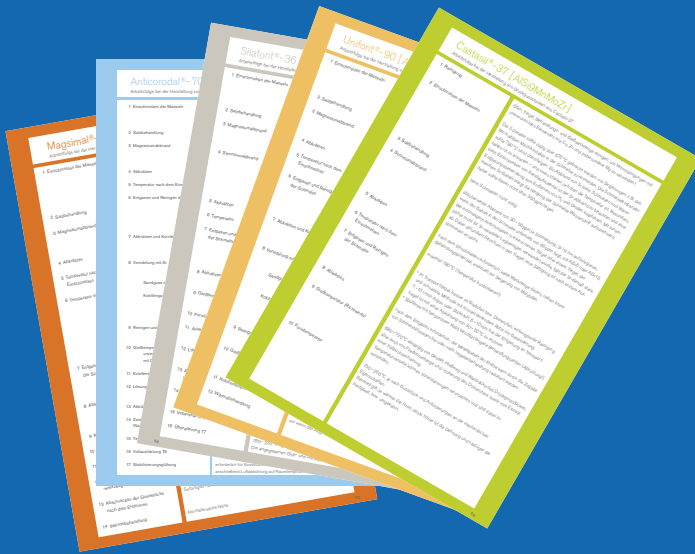


Processing data sheets



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 Melting down the ingots	As quickly as possible in efficient furnaces to keep oxidation and gas absorption of melts low; ensure as little Si as possible is absorbed in the melt composition!
2 Salt treatment when melting down	Not needed
3 Skimming	Needed after melting down
4 Temperature after melting down	Maximum of 800 °C (check temperature!)
5 Degassing and refining the melts	<ul style="list-style-type: none"> • Effective refining and fastest method using quick-running rotor for gas feeding, 7–10 l/min argon or nitrogen, 6–10 min • Gas flushing lance with fine porous head, needs longer treatment times (cooling!) • Gas flushing tablet emitting nitrogen at a rate of 150–350 l nitrogen/kg (bell plunger procedure)
6 Standing and skimming	Leave to stand for around 10 minutes, then carefully skim
7 Grain refinement	Grain refiner based on TiB ₂ : 0.15–0.30% tabletted fluxes, 0.1–0.2% master alloy wire (percentages by weight in relation to charge weight)
8 Standing and skimming	Leave to stand for at least 10 minutes, then carefully skim
9 Pouring temperature (approx. values) Sand casting Gravity die casting	Varies depending on casting method, design, size and wall thickness of castings: 720–760 °C 730–780 °C
10 Gravity die temperature	300–450 °C
11 Solution heat treatment	<p>The annealing time does not include the heating-up time to reach annealing temperature.</p> <ul style="list-style-type: none"> • Thin-walled castings (< 8 mm wall thickness): any but do not heat to 525–535 °C too quickly; hold for 8–10 hours; quench in water (20–50 °C) • Thick-walled castings (> 8 mm wall thickness): slowly heat up to 520–530 °C; hold for 12–18 hours; quench in water (20–50 °C) • Very thick-walled castings (> 20 mm wall thickness) are solution heat treated with stepped annealing
12 Stepped annealing	Slowly heat up to 490 °C; hold for 4–6 hours; then heat up to 520 °C; hold for 8–12 hours; quench in water (20–50 °C)
13 Artificial and/or full artificial ageing	170 ± 5 °C/6–7 hours; artificial and/or full artificial ageing produces high values for ultimate tensile strength, yield tensile strength and hardness with average elongation; partial ageing on the other hand produces very high elongation with lower levels of ultimate tensile strength, yield tensile strength and hardness
14 Partial ageing	140 ± 5 °C/6–7 hours
15 Cooling after ageing	Any, typically in air

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.



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