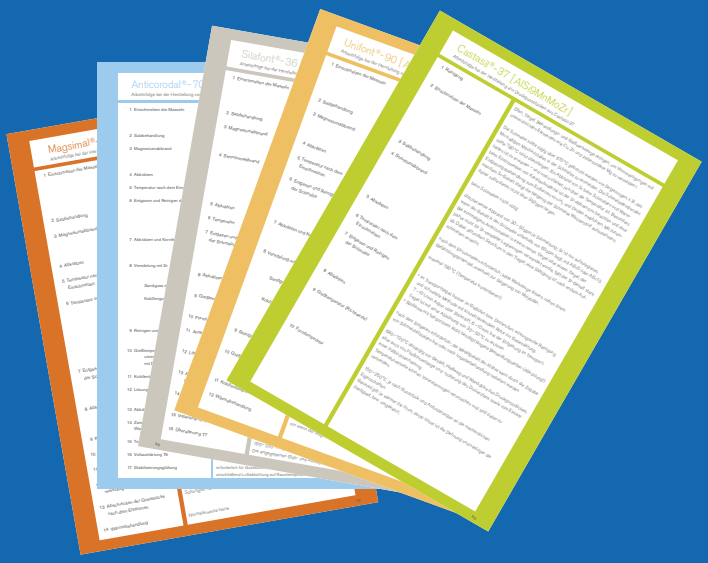
Processing data sheets



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.

Unifont®-90 [AlZn10Si8Mg]

Sequence of work when producing castings from Unifont-90

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1 Melting down the ingots	As quickly as possible in efficient furnaces to keep Mg melting loss, gas absorption and oxidation of melts low; replenish preheated ingots and returns in small volumes; even a low level of Cu impurity of 0,05 % in the melt composition should also be avoided!
2 Salt treatment	Not needed when melting
3 Magnesium burnout	Normally melting loss of 0.05 % per fusion; compensation is needed if the total magnesium content falls below 0.25 % and is achieved by adding Mg master alloy or pure magnesium
4 Skimming	Needed after melting down
5 Temperature after melting down	Maximum of 780 °C (check temperature!)
6 Degassing and refining the melts	• 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)
7 Skimming and grain refining	Best for Unifont-90 with granular microstructure, with a high proportion of returns: after skimming, grain refining with TiB master alloy or tabletted fluxes on nucleation states in excess of = 9, i.e. grain surface of less than 2.5 mm^2
8 Modification with Sr	When using permanently modified ingots only if the strontium content has fallen below 0.015 %; modify with AlSr master alloy, preferably one containing only 5 % strontium
Sand casting with Na	• With 0.03 – 0.04 vacuum-packed sodium or 0.2 – 0.3 exothermic modification tablets or 0.05 – 0.08 salt granulate (details provided as % of charge weight)
Gravity die casting with Na	• Thick-walled gravity die casting and gravity die casting with sand grains: with 0.015 – 0.025 vacuum-packed sodium or 0.1 – 0.2 exothermic modification tablets or 0.05 – 0.2 salt granulate (details provided as % of charge weight) Thin-walled gravity die casting is only modified with sodium in rare cases
9 Refining and skimming	Gas treatment with rotor is the preferred option, e.g. using integrated melt processing while adding sodium-salt granulate and gas refining at the same time
10 Pouring temperature (approx. values)	Varies depending on casting method, design, size and wall thickness of castings:
Sand casting	710 – 740 °C
Gravity die casting	720 – 750 °C
11 Gravity die temperature	300 – 400 °C depending on casting
12 Heat treatment	Only if the cast is being used straight away: age at 100 – 120 °C / 10 – 16 hours

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

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