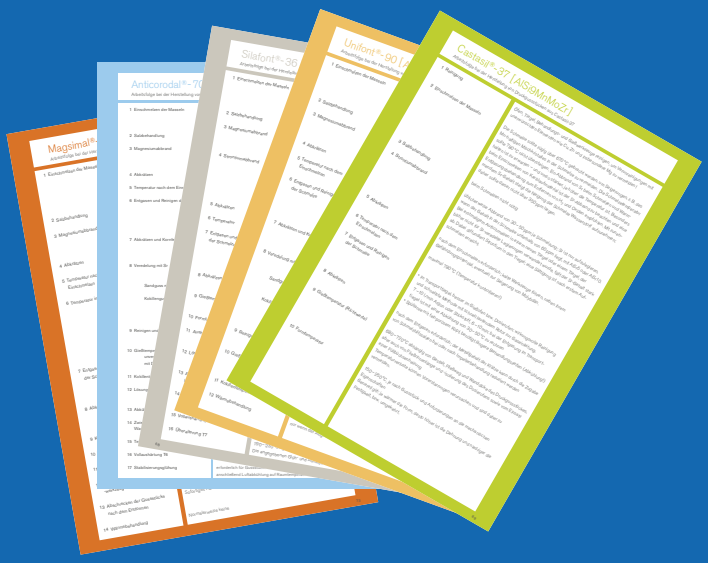
Processing data sheets



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.

Thermodur®-72 [AlMg7Si3Mn]

Sequence of work when producing high pressure die castings from Thermodur-72

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 to avoid segregation; use refractory materials with a high clay content; avoid phosphorous and sodium absorption
2 Salt treatment	Prohibited to use usual salt! There is a risk of Na pick up
3 Magnesium burnout	Normally melting loss of 0.1% per fusion, correction not normally needed; if the Mg content is significantly below 7.0%, add pure magnesium of maximum 0.5%
4 Skimming	Needed after melting down
5 Temperature after melting down	Maximum of 780 °C (check temperature!)
6 Temperature in holding furnace	Holding furnance temerature: 700 – 720 °C Do not allow to fall below 650 °C and keep melt moving by means of: • convection • rotor (impeller) • use bottom injection of N_2 • melt pouring Do not use deep furnace with cover heating if melt is calm!
7 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 tablets do not achieve the necessary effect!
8 Skimming	Careful skimming needed Only totally Na-free salts may be used to reduce the metal content of skimmings!
9 Grain refining	Prohibited!
10 Modification	Prohibited! The elongation achievable would be reduced considerably
11 Pouring temperature (approx. values)	690 – 730 °C, varies depending on design, size and wall thickness of high pressure die castings
12 Die temperature and die chamber temperature	Die surface temperature 250 °C to 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
13 Quenching casts after removal from mould	Immediate quenching in water reduces the yield tensile strength and increases elongation
14 Heat treatment	Normally none
15 stress-relief annealing	Only in special cases for T5 and O; if necessary, age T5 at up to 250 °C and for up to 90 min, the yield tensile strength will increase and elongation decrease; if necessary, age O at between 320 °C and 380 °C and for up to 90 min, the yield tensile strength will decrease and elongation increase

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