MATERIAL DATA SHEET · CASTING ALLOYS

Aluminum alloys per PN-EN 1706

We cast aluminum alloys only – in permanent molds, sand molds and by high-pressure die casting. We select the alloy grade to suit the casting process and the operating conditions of the part, taking into account the required strength, corrosion resistance and castability in thin walls.

PN-EN 1706
aluminum alloy designations – e.g., EN AC-42000

approx. 1/3
of the weight of steel – a lightweight, durable material for technical castings

3 furnaces
remelting with digital control of the melting process

250–600 kg
charge capacity of electric foundry furnaces

01 · Most commonly cast alloys

Designation	Symbol	Main alloying elements*	Properties	Typical applications
EN AC-42000	AlSi7Mg	Si 6.5–7.5 % Mg 0.2–0.65 %	good castability and corrosion resistance, high strength after heat treatment (T6)	automotive parts, engine housings, machine parts
EN AC-46200	AlSi8Cu3	Si 7.5–9.5 % Cu 2.0–3.5 %	high strength, good castability, limited corrosion resistance	engine housings, structural components, fittings
EN AC-46500	AlSi9Cu3(Fe)(Zn)	Si 8–11% Cu 2–4% Zn up to 3%	very good castability and machinability, limited corrosion resistance	electronics housings, automotive parts, household appliances
EN AC-47100	AlSi12Cu1(Fe)	Si 10.5–13.5 % Cu 0.7–1.2 %	very good castability – also in thin walls, good leak tightness	automotive parts, engine components, electrical equipment
EN AC-51300	AlMg5	Mg 4.5–6.5 %	very good corrosion resistance, including in marine environments; polishes and anodizes well	marine hardware, decorative elements, structural parts

* Chemical composition ranges (wt %) are given as a guide – the composition according to PN-EN 1706 and the material certificate is binding.

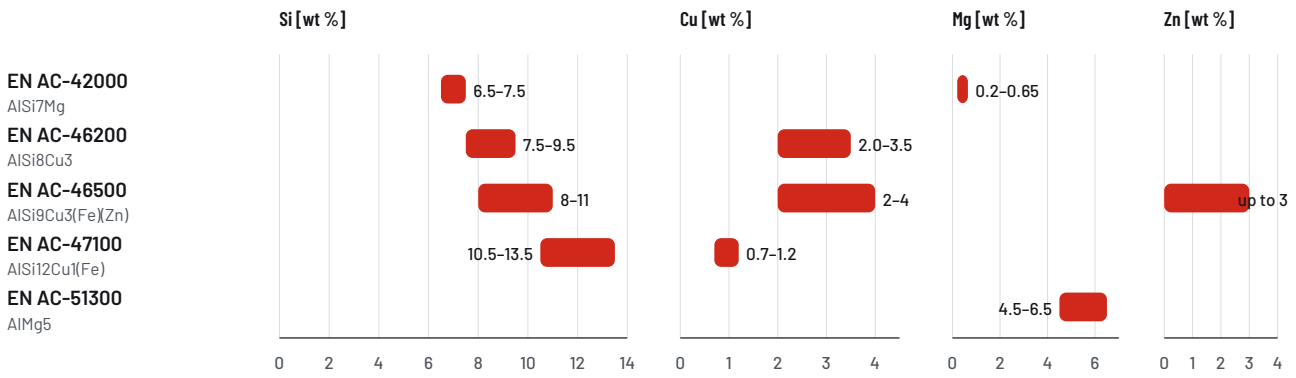

Fig. 1. Ranges of the main alloying elements (wt %) according to the table above; an empty cell means the element is not a main constituent of the given alloy.

02 · Alloy and casting technology

Alloy	Permanent mold casting	High-pressure die casting	Notes
EN AC-42000 (AlSi7Mg)	yes	–	cast in permanent molds
EN AC-46200 (AlSi8Cu3)	yes	yes	Al-Si-Cu alloy
EN AC-46500 (AlSi9Cu3(Fe)(Zn))	yes	yes	Al-Si-Cu alloy
EN AC-47100 (AlSi12Cu1(Fe))	yes	yes	good castability in thin walls
EN AC-51300 (AlMg5)	yes	–	cast in permanent molds

Sand casting: aluminum alloys per PN-EN 1706, selected to suit the casting's service conditions. We confirm the alloy for a specific part when quoting.

03 · Melting – from raw material to casting

We use certified charge material from proven suppliers, with a composition that almost fully meets the customer's requirements. The charge is protected against contamination, moisture and alloy mix-ups. We do not use scrap from external sources; as an exception, for process economy, we add selected in-house scrap (rejects and gating systems) with a composition that complies with the required standard. Every batch of charge material is checked for element content.

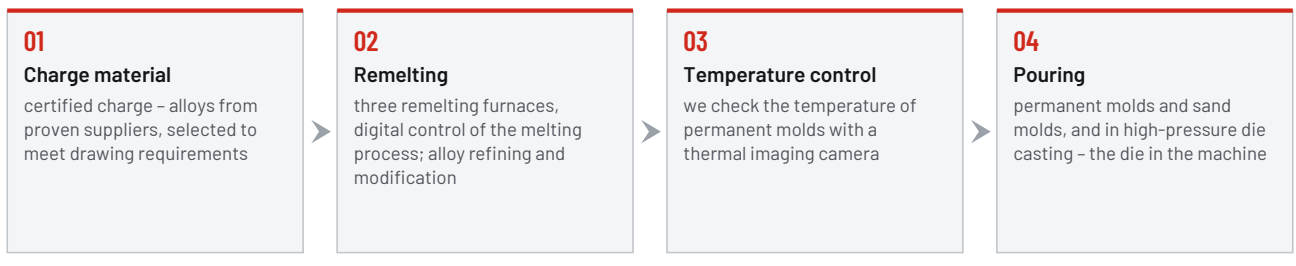

Fig. 2. Four melting steps controlled on every order.

- **Refining** – removes unwanted gases and inclusions from the liquid metal.
- **Modification** – optimizes the crystalline structure of the alloy, improving strength, hardness and crack resistance.
- **Testing** – regular chemical composition tests and laboratory analyses.

04 · After casting and in your inquiry

After casting – capabilities

- heat treatment of permanent mold and sand castings – annealing, quenching, solution treatment
- CNC machining of critical dimensions
- strength testing and material structure analysis – on request
- powder coating in RAL colors

What to specify in your inquiry and order

- alloy designation per PN-EN 1706, e.g. EN AC-42000, EN AC-46200
- required mechanical properties (e.g. tensile strength, yield strength, elongation, hardness) and the method of verifying them, e.g. by testing specimens
- material condition, if relevant – e.g. after heat treatment
- type of inspection document, if required – e.g. per PN-EN 10204

Contact and quotation

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