

The One-Shot Casting Process

What is One-Shot Casting?

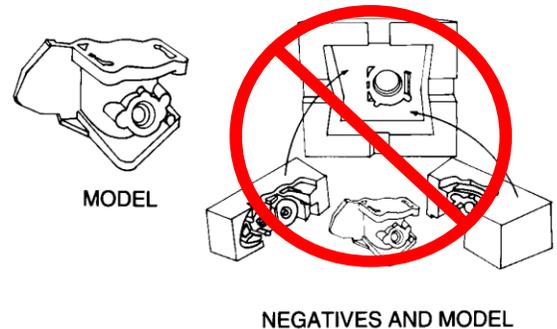
Plaster mold casting is a method of producing aluminum, zinc or magnesium castings by pouring liquid metal into plaster (gypsum) molds. At Armstrong Mold, there are two methods of plaster mold casting:

- 1) Rubber Plaster Molding (RPM): Patterns create foundry tooling that makes copes, drags and core boxes used to create the plaster molds.
- 2) One-Shot Casting: Plaster is poured directly on patterns, which are melted out in a furnace cycle.

Following is the process for the One-Shot method of making plaster mold castings.

Step 1: Model/Pattern

- 1) Constructed from customer drawing or CAD file.
- 2) Laser-sintered patterns are produced.
- 3) Model is engineered to include:
 - A) Metal shrinkage.
 - B) Mold taper (if required)
 - C) Machine stock (if required).
- 4) We can "clone" or adapt customer-supplied model if requested.



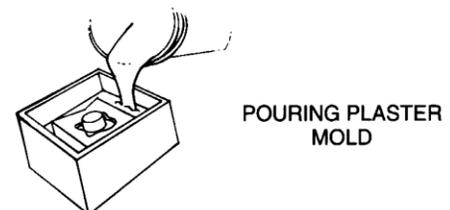
Step 2: Plaster Mold

- 1) A liquid plaster slurry is poured around the pattern.
- 2) The plaster mold is heated in a furnace to melt out the pattern and cure plaster.



Step 3: Pour Casting

- 1) Molten metal is prepared by degassing, and a spectrographic sample is taken to check the chemical analysis.
- 2) The molten metal is then poured into the plaster mold.
- 3) The plaster is removed by mechanical knock-out and high pressure waterjet.
- 4) When the casting has cooled, the gates and risers are then removed.



Step 4: Secondary Operations

- 1) The raw castings are inspected and serialized.
- 2) Castings may then require (per customer specifications):
 - A) Heat treatment
 - B) X-Ray
 - C) Penetrant inspection
- 3) After finish inspection, casting is ready for:
 - A) Machining
 - B) Chemical film, chromate conversion, paint special finishes
 - D) Assembly
 - E) Form-in-place gasketing.

