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.