The Plaster Mold Process

What is it?

Briefly stated this is a method of producing aluminum or zinc castings by pouring liquid metal into plaster (gypsum) molds.

Step 1  Model or Master Pattern
1) This is made from customer drawing or CAD file
2) Stereolithography, traditional hand crafted or machined
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  Foundry Pattern Equipment
1) Negative molds are made from model
2) Core plugs are made from negative molds
3) A positive resin cope and drag pattern is now made from the negative molds
4) Core boxes are made from the core plugs
5) Gating, runner system and flasks are added as necessary
6) Duplicate sets of tooling can be made from the master negative

Step 3  Plaster Mold
1) A liquid plaster slurry is poured around the cope and drag pattern and into the core boxes
2) The plaster mold is next removed from the cope and drag patterns
3) The plaster mold and cores are then baked to remove moisture

Step 4  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 assembled 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 5  Secondary Operations
1) The raw castings are inspected and serialized
2) Flash and excess metal is removed (snagged)
3) Castings may then require (per customer specifications):
   A) Heat Treatment
   B) X-Ray
   C) Penetrant Inspection
4) After finish inspection, casting is ready for:
   A) Machining
   B) Chemical film, chromate conversion, paint or special finishes
   C) Assembly
   D) Form in place gasketing