

Investment casting, also known as lost wax casting, is a precision casting process used to create metal parts from almost any alloy, and is typically used to create complex, thin-wall castings. Since 1959, Bimac has been one of the leading investment casting providers in the Midwest. Below is a list of key steps in the investment casting process. Please contact us for more information.

INVESTMENT CASTINGS WAX INJECTION

The investment castings process begins with fabrication of a sacrificial pattern with the same basic geometrical shape as the intended finished cast part. Patterns are normally made of investment casting wax that is injected into a metal wax injection die (Fig. 1).

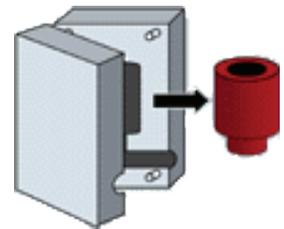


FIG. 1

ASSEMBLY

Fabricating the injection die can often require several months of lead time. Once a wax pattern is produced, it is assembled with other wax components on a central wax stick, called a sprue, to form a casting cluster or assembly (Fig. 2).



FIG. 2

INVESTMENT CASTINGS SHELL BUILDING

The entire wax assembly is then dipped in a ceramic slurry and covered with a sand stucco (Fig. 3), and allowed to dry.

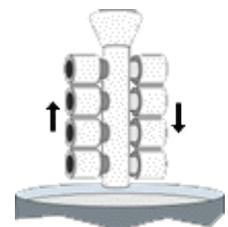


FIG. 3

DEWAXING

The dipping and stuccoing process is repeated until a shell of ~6-8 mm (1/4-3/8 in) is applied. Once the ceramic has dried, the entire assembly is placed in a steam autoclave to remove most of the wax and the remaining amount of wax that soaked into the ceramic shell is burned out in a furnace (Fig. 4).



FIG. 4

INVESTMENT CASTINGS METAL CASTING POURING

At this point, all of the residual pattern and gating material is removed, and the ceramic mold remains. The mold is then preheated to a specific temperature and filled with molten metal, creating the metal casting (Fig. 5).



FIG. 5

KNOCKOUT

Once the casting has cooled sufficiently, the mold shell is chipped away from the casting (Fig. 6).



FIG. 6

CUTOFF

Next, the gates and runners are cut from the casting (Fig. 7).

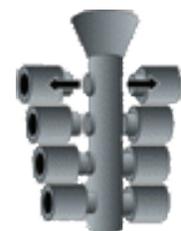


FIG. 7

FINISH

After minor final postprocessing (sandblasting, machining), the castings - identical to the original wax patterns - are complete and ready for shipment (Fig. 8).



FIG. 8