INVESTMENT CASTINGS

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).

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).

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.
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).

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).

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

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