

Investment Casting

(6) **Dewax:** After the shell has dried it is ready to dewax. The shell is inverted and placed in the burnout oven over a port to melt and collect the wax out of the shell. This is usually accomplished at 1500° F to 1700° F. Any wax that doesn't drain out is consumed by combustion. After dewaxing is complete, normally 20 minutes, the shells are removed from the oven and allowed to cool to room temperature. After cooling, the shells are inspected for cracks. If any cracks are detected they are covered with a refractory cement. Some Rapid Prototype shells have to be heated to 2050°F for longer times to burn out all of the material they are made of, due to the many different kinds of Rapid Prototype materials.

(7) **Preheat:** Shells are fired before pouring to remove any moisture and residual wax that may be left, and also to sinter the mold. Shells are normally fired for at least one hour or until completely heated through. Temperature may vary according to size and detail.

(8) **Pouring:** The shell is placed pouring cup upwards in a bin of sand. The metal is gravity poured at different speeds according to size of the parts.

(9) **Shell Removal:** The shell is removed by many different methods according to the metal and complexity of the parts. Most are removed by vibrating, followed with media blasting. Parts with holes or cavities sometimes need to have the shell chemically leached to get all of the shell removed.

(10) **Finishing:** Parts are removed from the tree by abrasive cutoff. Gates are then removed by abrasive grinding.

Investment casting can be used with almost any metal, however aluminum alloys, copper alloys, carbon steels, stainless steels, tool steels, and cobalt are the most common.

Some of the advantages of investment castings include:

- Excellent surface finish
- High dimensional accuracy
- Extremely intricate parts are castable
- Minimal parting lines.

