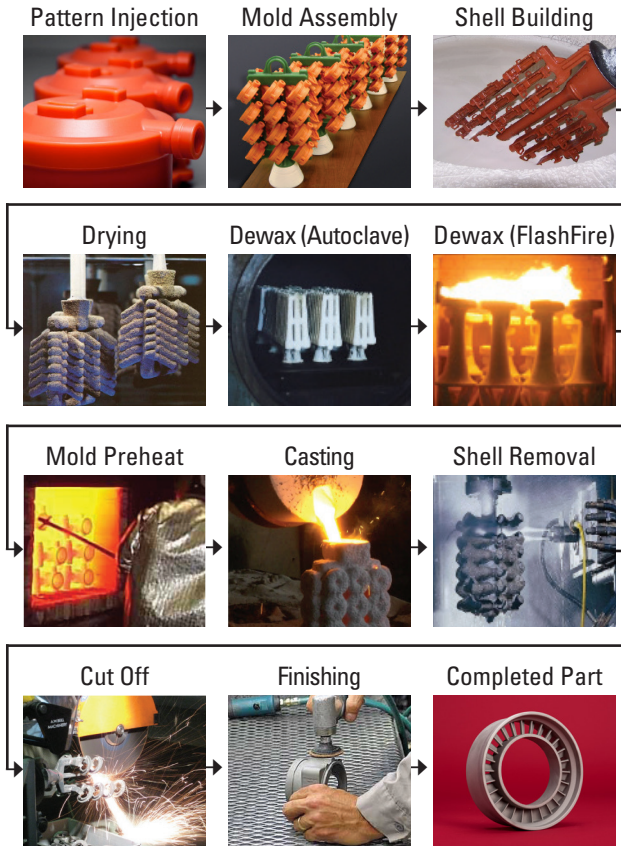


Investment Casting Process



Today's Industry

Investment casting is a \$12 Billion industry, with the US accounting for nearly half of the world's total production.

Companies range from privately owned foundries with sales of less than \$500,000 to multinationals producing several billion dollars of product per year.

Industry Infrastructure is multi-tiered, with a diverse supply

- Equipment Manufacturers
- Direct Material Manufacturers
- Service Provides and System Integrators

Career Opportunities

- The industry is led by engineers at all professional levels, from entry level college graduates to chief executive officers.
- Engineers from nearly every discipline can find employment in the investment casting industry.
- The industry is also a major employer of non-degreed skilled labor.
- Investment casting opportunities can virtually be found in every state.
- The Investment Casting Institute is committed to the sustainability of the industry, and is therefore here to help you find your place in the industry.

Let Us Help You Start an Exciting Career!

- The Investment Casting Institute will post your resume for its 245 members to review for internships and permanent job opportunities.
- After completing an internship, a student can apply for a scholarship through the ICI.
- The ICI offers students networking opportunities at a variety of events where students can meet industry professionals.
- The ICI highlights top students and their schools every December in INCAST Magazine, the world's only monthly magazine dedicated to the industry.
- The Institute offers a number of publications, training programs and the world's only certification program to help you get your career off on the right foot.

INVESTMENT CASTING as a Career



The Investment Casting Institute



The Investment Casting Institute

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Investment Casting Origins

Investment casting is a metal forming process first used in ancient Egypt and China.

Also known as the “Lost Wax” process, investment casting has played a crucial role in modern manufacturing since the development of the first turbine engine.

This process provides:

- High quality surface finish
- Exotic, high performance, high temperature alloys
- Net shape or near net complex shapes and configurations – minimizing or eliminating machining, assembly and costs

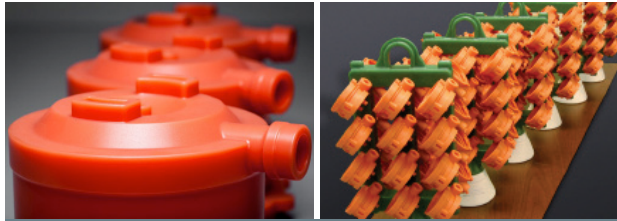


Markets Served by Investment Casting

- Aerospace and Defense
- Transportation
- Power Generation
- Oil and Gas Exploration
- Orthopedic Implants & Medical Equipment
- Food Processing Equipment
- Fine Art and Jewelry
- And much more!

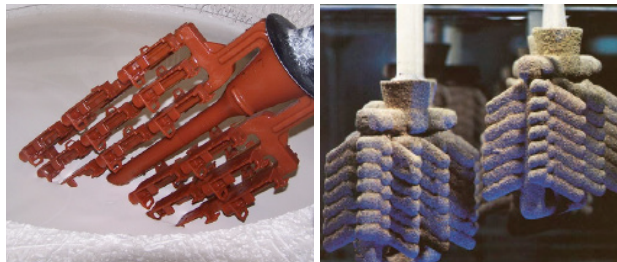


The Investment Casting Institute



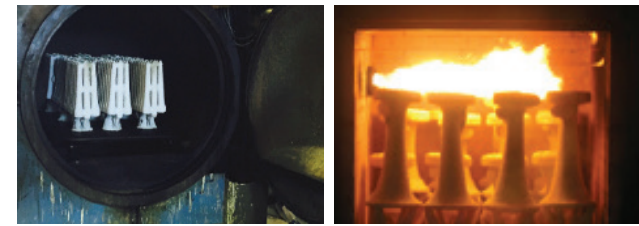
Investment Casting Process *Wax Pattern Manufacture*

- To produce an investment casting, wax is fashioned into the desired shape of the finished product either through injection of wax into a mold, 3D printing or hand fabrication, resulting in a “pattern.”
- Typically, multiple wax patterns are assembled onto a wax sprue, forming what is often called a tree or a cluster.



Investment Casting Process *Shell Building*

- The resulting cluster is dipped into a ceramic slurry and backed with sand or “grit.”
- This “dipping” process is repeated numerous times, creating laminate layers of stucco, resulting in what is called a shell or a mold.



Investment Casting Process *Dewax and Casting*

- Once the shell has dried, the wax is melted out, using a steam dewax autoclave or a flash fire burn out oven or both, creating voids in the mold which are representative of the desired part shape.
- The mold is then heated to ensure proper metal flow to the part cavities, and liquid metal is poured into the mold.



Investment Casting Process *Shell Removal and Finishing*

- Once cool, the shell is removed by either mechanical or chemical means.
- The parts are cut off and finished for end use.