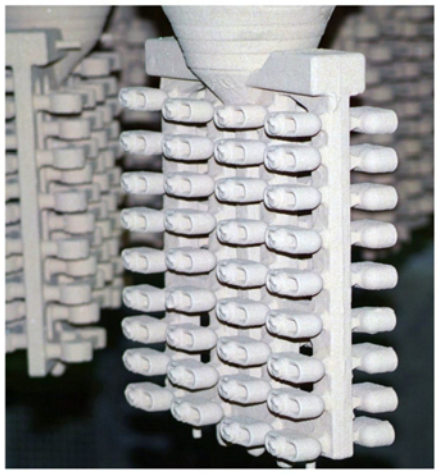

Godani

Index

Introduction...

Investment Casting is an industrial process based on lost-wax casting. one of the oldest known metal-forming techniques. The term "lost-wax casting"can also refer to modern investment casting processes. Investment casting has been used in various forms for the last 5000 years. In its earliest forms, beeswax was used to form patterns necessary for the casting process Today, more advanced waxes, refractory materials and specialist alloys are typically used for making pattern. Investment casting is valued for its ability to produce components with acccuracy , repeatability ,versatility and integrity in a various of metals and high performance alloys.

The fragile wax patterns must withstand forces encountered during the mold making. Much of the wax used in investment casting can be reclaimed and reused. Lost-foam casting is a modern form of investment casting that eliminates certain steps in the process.



Investment casting derives its name from the pattern being invested (surrounded) with a refractory material. Many materials are suitable for investment casting; examples are stainless steel alloys, brass, aluminium, carbon steel and glass. The material is poured into a cavity in a refractory material that is an exact duplicate of the desired part. Due to the hardness of refractory materials used, investment casting can produce products with exceptional surface qualities, which can reduce the need for secondary machine processes.

Investment Casting Process

The Following Step are what we follow to produce parts with complex geometries and intricate details:

1. **Create Wax pattern:** A pattern that replicates the finished part geometry is made using one of two primary method :

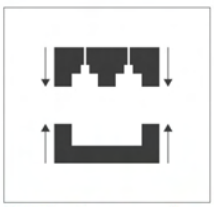
   a. Build a wax injection die .

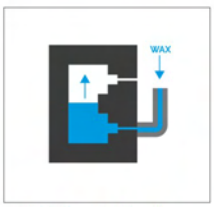
   b. 3D print pattern

   (i). If a wax injection die will be used the first step involves designing and building a metal die from aluminium. This die creates a wax replica of the desired part by injecting melted wax under high pressure into the cavity. The die can be made as a simple one cavity manual tool or a complex multi-cavity automatic tool depending on volume requirements.

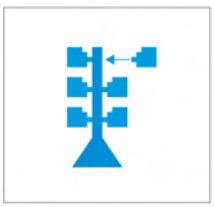
   (ii) If a 3D printed pattern will be used , a CAD model which contain the part geometry is sent to a printer and the part is printed.
2. **Wax Assembly:** Next the wax pattern are assembled into runner and into a finished tree which is ready to be dipped.
3. **Slurry Coating:** The assembly is then dipped into a high -grade ceramic slurry to bulid a ceramic shell around the wax tree.
4: **Stuccoing:** After the slurry coating is done particles of sand are dropped into the surface of the wet tree assembly . this helps to thicken and strengthen the layer of coating on the wax assembly surface.
5: **Repeat Step 5 and 6:** Repeat step 5 and 6 until the assembly achieves the desired shell thickness. The assembly is then allowed to set and dry.
6. **Dewaxing:** The wax inside the newly built shell is now removed. Dewaxing is done using a steam - dewaxing autoclave or flash fire furnace.
7. **Casting:** Now the desired molten metal is poured into the pre-heated mould cavity.
8. **Cooling:** The mold then sits to allow the molten metal to cool and solidify which them becomes the final casting.
9. **Shell Removal:** The shell Material is then removed though processes hammer knockout vibration and steel grit blasting.
10. **Cut Off:** The finished parts are then cut free from the gating and runner system.
11. **Finishing:** Various finishing techniques are then employed including grinding. sand blasting and coating to achieve the final surface needed.
12. **Testing:** Once finishing operation is done . the parts are inspected for surface and sub-surface defects visual and fluorescent penetrant inspection is done for surfaces and X-ray is employed for sub-surface defect identification.

Investment (Lost Wax) Casting Process Steps


1-Die Construction



2-Wax Injection


3- Wax Assembly


4-Slurry Coating


5- Stuccoing


6- Dewaxing


7- Casting


8- Shell Removal


9- Cut Off


10- Finishing

Tool Room

- We have dedicated team of engineers for designing tools for casting industries.
- All tools machines on VMC to ensure high accuracy in cutting.

Tool Room

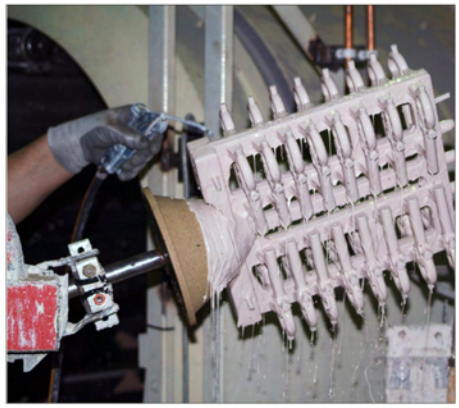
Vertical Machining Centre

Wire Cut Machine

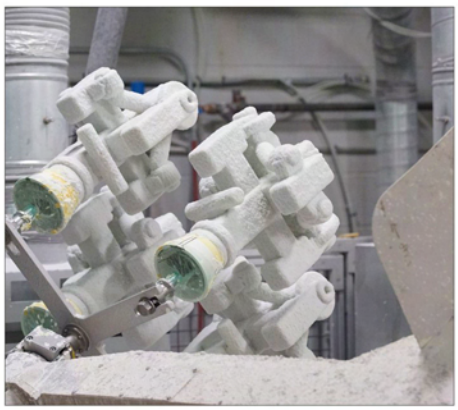
Wax Injection

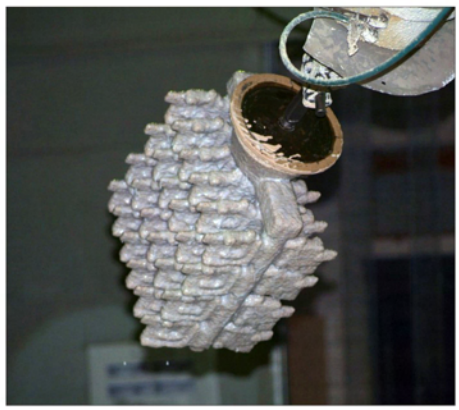
- Injection and production of wax patterns are 100% dimensionally checked. Shell coating process is done in temperature and humidity controlled room so that best dimensional accuracy and excellent surface finish is achieved.

Wax Injection



Shell Coating





Metal Casting

- We have One no. 175KW/3000H2 VIP-DT-R with three nos 150 kgs Duraline Furnance.
- WE cast both Ferrous and non- Ferrous

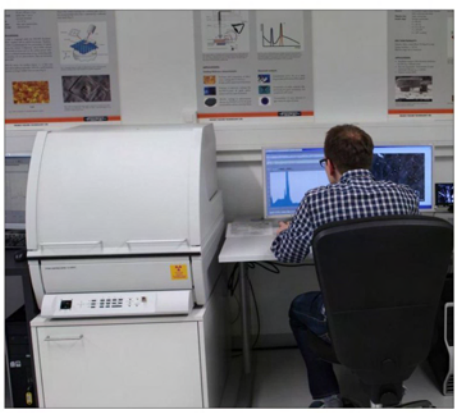
Molten metal

Metal pouring

Molten metal

Quality Control & Machining Facility

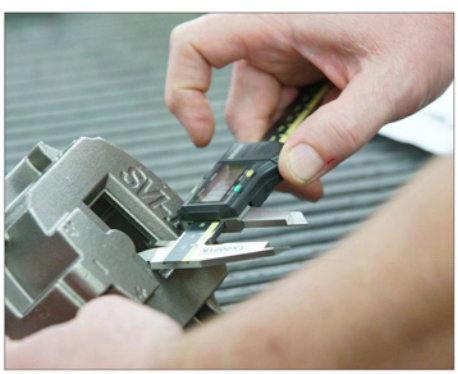
- We constantly invest in quality , safety and accuracy for that we have optical measuring machines, hardness testing , spectrometer, CNC turning center and other various machining, measurement and testing equipments are available to insure consistently good products quality.

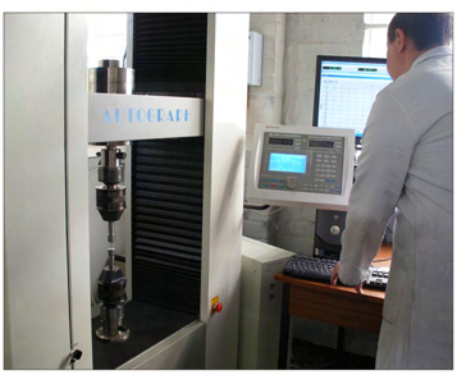


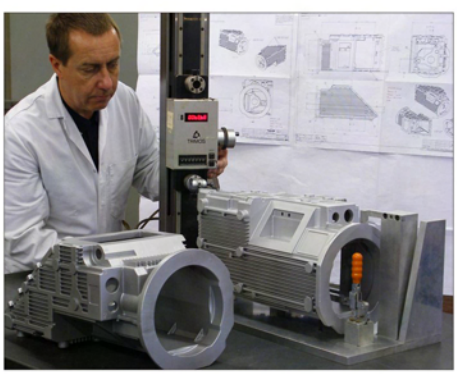
Spectrometer

UTM & Hardness testing machine

CNC Turning

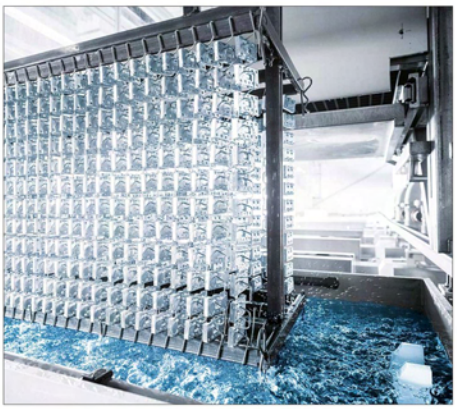






Electroplating

- We are engaged in providing high quality electroplating to our customer . we have latest technology, state of art infrastructure for all types of surface finishing.



Our Services / Market we serve

- Automobile

  Materials - MS, SS, EN series, Zinc



- Marine

  Materials - MS, SS, EN series



Engineering

Materials - MS, SS, EN series



Valves

Materials - MS, SS



Pipe Fitting

Materials - SS



Fire Fitting

Materials - SS

Saddlery Products

Materials - SS

Hardware

Materials - SS

Medical Equipments

Materials - SS

Bathroom Fitting

Materials - SS

Deffence

Materials - SS, MS, EN Series

Notes :

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