



Casting Process: Investment Casting

NovaCast has built a reputation for manufacturing high quality investment cast valve and pump components, primarily in carbon steel and stainless steel, including pressure tight valve and pump bodies, machined and balanced impellers and many other highly specified products. The investment casting process delivers high integrity castings that are dimensionally accurate, very versatile and have low repeat run costs.

This process data sheet describes the basic steps involved in the investment casting process as well as the benefits and limitations of the process:

- 1** A metal die is made, the impression being the same as required in the final mould.
- 2** Molten wax is injected into the metal die, allowed to solidify and then removed. Some complex wax patterns are fabricated by joining several separate patterns together using an adhesive.
- 3** The waxes are then assembled on a wax tree, many parts can be put on the tree depending on size; it is common for components to be in the weight range 0.1kg up to 80kg.
- 4** The tree is then immersed in several different slurries to coat the wax, the initial slurry is fine as this will be the surface finish of the final casting.
- 5** After drying, the trees of wax are put into ovens of about 200°C to melt out the wax.
- 6** When all wax is removed the trees are heated up to about 900°C to complete preparation for casting.
- 7** The metal is then poured into the moulds, allowed to cool, and the mould is broken away to reveal the finished casting.



Investment Casting

Why use NovaCast investment casting?

Investment casting delivers many benefits including:

- Great versatility; suitable for casting most metals
- High volume production with low repeat costs
- Intricate castings can be produced
- Smooth surface finishes with no seam line so machining and finishing are reduced/ eliminated
- Un-machinable parts can be cast accurately
- Excellent dimensional accuracy
- Can be used to prototype and prove designs prior to die casting tooling investment
- Is ideally suited to smaller, intricate or complex designs although we can cast up to 250kg

Limitations of the process

There are some disadvantages to this process including:

- Preparation of the wax patterns and shell moulds is time consuming and expensive.
- Initial tooling cost higher than other processes
- Not well suited to very high volume manufacturing due to long cycle times.

About NovaCast

NovaCast has over 40 years of ferrous and non-ferrous metal casting experience extending into markets as diverse as transport, utilities, offshore and general engineering. The company's non-ferrous foundry, based in Melksham, England, is supported by a fully risk-managed supply chain that extends out to the Far East allowing NovaCast to provide a single source solution for precision cast and machined components. Metals cast include alloys of Carbon and Stainless Steel, Copper, Aluminium and many others with a full range of testing, machining, surface treatment and finishing options.

To find out more, get a quote or just to discuss your project, give us a call on +44 (0)1225 707466 or email sales@novacast.co.uk