

Casting Process: Sand Casting

Sand casting is a relatively simple production method but has many advantages, particularly for short-run or complex castings with multiple cores or for larger castings. NovaCast is able to produce sand moulds by hand using Greensand for smaller quantities and resin or petro-bonded techniques using a semi-automated process for larger quantities.

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

- 1** A wood, resin or metal pattern is made which forms an impression of the component to be cast. The pattern must take account of shrinkage during cooling to deliver dimensional accuracy.
- 2** The pattern is used to make a two-part mould, usually in greensand or resin bonded sand. The top section of the mould is called the cope and the bottom section is the drag.
- 3** If cores are required to form internal structures, these are made in CO₂ or resin sand and placed within the mould to create internal voids.
- 4** Molten metal is poured into the mould, which is then allowed to solidify.
- 5** The casting is then removed from the mould and up to 70% of the sand is reclaimed.
- 6** The casting then goes through the fettling process to remove the risers and excess material
- 7** Castings often undergo further surface finishing before dispatch to the customer



Sand Casting

Why Use NovaCast sand casting?

Sand casting has several benefits including:

- Low tooling costs and fast set-up compared to investment or die casting.
- Complex and intricate castings can be achieved with multiple internal cores.
- Up to 70% of the sand used in the process is reclaimed.
- Sand casting is best suited to low volume or complex non-ferrous castings or large ferrous castings.
- Large casting sizes possible. NovaCast is able to cast aluminium alloys up to 110kg and ferrous alloys up to 3000kg using sand casting methods.
- It is possible to achieve low gas porosity for pressure tight castings.
- Very versatile; many different kinds of metal alloy can be cast using this process.

Limitations of the process

There are some limitations with this process including:

- Relatively slow casting rate.
- Wall thicknesses need to be a minimum of about 4mm and linear tolerance can be relatively poor.
- The surface finish can be fairly coarse so some finishing is usually required.

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