



Casting Process: Low Pressure Die Casting

In LPDC, molten metal is forced, under low pressure, into a die. The controlled and constant pressure exerted on the molten metal as it enters the mould and solidifies compensates for shrinkage reduction in volume as the metal cools. The sealed process reduces oxide formation, as there is less exposure to the atmosphere, and reduces porosity. As a result, LPDC delivers exceptional density, strength, and dimensional accuracy, and better consistency throughout the casting. Applications include: Aluminium automotive parts, critical aerospace castings, electric motor housings, impellers, winding wheels and other complex castings.

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

- 1** A metal die (mould) is manufactured in 2 parts with a horizontal parting line.
- 2** A melting furnace brings the metal alloy to casting temperature.
- 3** The molten alloy is transferred to a holding furnace located below the mould assembly.
- 4** The alloy is then forced at low pressure, typically 0.7bar (10psi), through a vertical riser tube into the mould.
- 5** The pressure is maintained throughout the process until the metal has solidified within the die cavity.
- 6** Once solidified, the pressure is released. Any remaining molten metal returns to the holding furnace chamber.
- 7** After a short cooling period, the casting is removed from the die and the process repeats.



Low Pressure Die Casting

Why use NovaCast Low Pressure Die Casting?
LPDC delivers many benefits including:

- Exceptionally pure and consistent castings due to low oxidation
- Delivers good strength values as crystallisation takes place under pressure forming dense structures
- High dimensional accuracy; good for making axially symmetrical parts, such as wheels
- Easy to automate with relatively simple machinery and die technology
- High material utilisation as no risers are required
- Surface finishes can be exceptionally good
- Ideal for making parts with complex geometries

Limitations of the process

There are some disadvantages to this process including:

- Slow cycle times can result in high unit production costs
- Tooling costs can be high due to erosion of the die which can also lead to contamination of the cast alloy
- Not suitable for making thin-walled parts

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