Special Casting Processes

Summary

Sandcasting is not suitable for applications where large volumes of parts are to be produced or complex geometries are involved. For this purpose, a number of special casting methods are devised.

- Shell moulding is a special casting process used for specific applications that require higher quality castings with thin surface details. It uses resin-coated sand for making the mould that is strong and porous.
- Precision investment casting utilises an expendable pattern to create really complex objects without any parting line. This ensures very high precision and excellent properties.
- Permanent mould casting utilises a metallic mould to prepare the casting. This helps in lowering costs for mass production at the same time ensuring a fine-grained structure with improved mechanical properties for the casting.
- Pressure die-casting can be utilised for very complex shapes. This process uses a metallic die and the molten metal is injected at very high pressure ensuring the filling of very small cavities at a fast rate. The resulting casting is completely filled with smooth finish and fine-grained structure. It is very economical when produced in large volumes.
- Vacuum die-casting ensures the removal of entrapped air in the die inside the casting, thereby ensuring a sound casting.
- In centrifugal casting, the mould is rotated at high speed, which ensures that the slag and impurities in the molten metal are separated and removed effectively. This ensures that the casting produced is sound. There are other variations in this process to cater to the different types of casting sizes and geometries produced.
- Continuous casting allows for the fast production of constant cross-sectional shapes in large volume.