

SUBJECT:-PRODUCTION TECHNOLOGY (MECH. 2ND YEAR)

NAME:-ABHAY SUNDRIYAL

DATE:-27/04/2020

CENTRIFUGAL CASTING

In centrifugal casting process, molten metal is poured into a revolving mould and allowed to solidify molten metal by pressure of centrifugal force. It is employed for mass production of circular casting as the castings produced by this process are free from impurities. Due to centrifugal force, the castings produced will be of high density type and of good strength. The castings produced promote directional solidification as the colder metal (less temperature molten metal) is thrown to outside of casting and molten metal near the axis or rotation. The cylindrical parts and pipes for handling gases are most adoptable to this process.

Centrifugal casting processes are mainly of three types which are discussed as under.

- (1) True centrifugal casting
- (2) Semi-centrifugal casting and True Centrifugal Casting
- (3) True Centrifugal Casting

True centrifugal casting

In true centrifugal casting process, the axis of rotation of mould can be horizontal, vertical or inclined. Usually it is horizontal. The most commonly articles which are produced by this process are cast iron pipes, liners, bushes and cylinder barrels. This process does not require any core. Also no gates and risers are used. Generally pipes are made by the method of the centrifugal casting. The two processes namely De Lavaud casting process and Moore casting process are commonly used in true centrifugal casting.

De Lavaud Casting Process

In this process, metal moulds prove to be economical when large numbers of castings are produced. This process makes use of metal mould. The process setup contains an accurately machined metal mould or die surrounded by cooling water. The machine is mounted on wheels and it can be move lengthwise on a straight on

a slightly inclined track. At one end of the track there is a ladle containing proper quantities of molten metal which flows a long pouring spout initially inserted to the extremity of the mould. As pouring proceeds the rotating mould, in the casting machine is moved slowly down the track so that the metal is laid progressively along the length of the mould wall flowing a helical path. The control is being achieved by synchronizing the rate of pouring, mould travel and speed of mould rotation. After completion of pouring the machine will be at the lower end of its track with the mould that rotating continuously till the molten metal has solidified in form of a pipe. The solidified casting in form of pipe is extracted from the metal mould by inserting a pipe puller which expands as it is pulled.

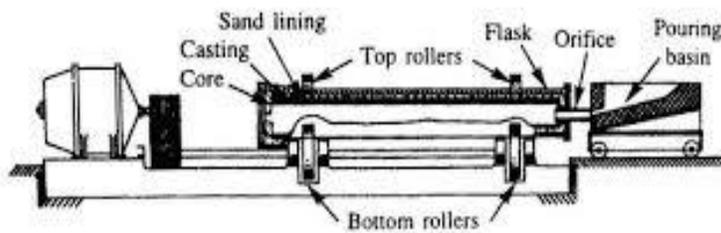


Fig. 11.12 True centrifugal casting

Semi-Centrifugal Casting

It is similar to true centrifugal casting but only with a difference that a central core is used to form the inner surface. This casting process is generally used for articles which are more complicated than those possible in true centrifugal casting, but are axis-symmetric in nature. A particular shape of the casting is produced by mould and core and not by centrifugal force. The centrifugal force aids proper feeding and helps in producing the castings free from porosity. Symmetrical objects namely wheel having arms like flywheel, gears and back wheels are produced by this process.

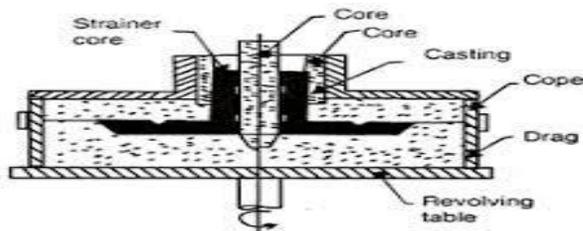


Fig. 4.16. Semi-centrifugal Casting.

Centrifuging Casting

Centrifuging casting setup is shown in Figure. This casting process is generally used for producing nonsymmetrical small castings having intricate details. A number of such small jobs are joined together by means of a common radial runner with a central sprue on a table which is possible in a vertical direction of mould rotation.

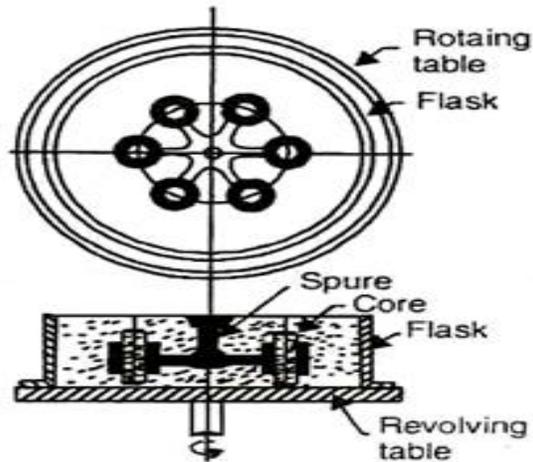


Fig. 4.17. Centrifuging casting.

Slush Casting

Process: Mostly pewter is casted using the **slush casting** technique. Firstly, a pattern is made using plaster or wood. Now the pattern is placed on a cardboard or wooden board. A mold box is kept around the pattern. The unwanted space that is formed in the mold box can be eliminated by placing a board. Once the pattern is set the molding material is poured on the pattern and allowed to set with the molding aggregate. When the mold is set, the pattern is withdrawn from the mold.

The metal melted completely and poured into the mold which is shaped in the desired form. Rotate the mold to coat the sides. When the metal settles in the mold, remaining liquid metal is poured out of the mold. Thus, a hollow skin metal is formed inside the mold.

If the cast needs to be more thicker, once again molten metal is poured into the

mold and poured out. This process is repeated until the desired thickness is achieved. In some **slush castings**, bronze molds are used. When the metal hardens, the mold is broken to remove the castings. The inside of each cast retains molten textures while the exterior is smooth and shiny. Bowls and vases are serially produced by this technique that ensures no two are ever the same.

Similarly, to cast metals a bowl, a new process designed to capture the beauty of Pewter and its unique characteristics. Recycled molten Pewter is swirled inside a mould to form a fine skin. The inside of each cast retains molten textures whilst the exterior is smooth and shiny. Bowls are serially produced by a technique that ensures no two are ever the same.

Application: Some casting of pewter is cast using **slush casting** method. Using pewter and other metals mainly hollow products are casted. Decorative and ornamental objects that are casted are as vase, bowls, candlesticks, lamps, statues, jeweleries, animal miniatures, various collectibles etc. Small objects and components for industry like tankard handle, handles for hollow wares, etc.

Advantage:

- Slush casting is used to produce hollow parts without the use of cores
- The desired thickness can be achieved by pouring out the left over molten metal
- A variety of exquisitely designed casting can be casted for decorative and ornamental purpose.