

Mould and Castings

Most components are made by ferrous and non-ferrous metals

Iron, steel, aluminum etc.

Complicated shapes sometimes may not be produced on the components with conventional machining processes.

SAND CASTING is

One of the processes used for making components of complicated shapes larger quantity.

Casting is

Metal parts producing by pouring molten metal into the mould cavity of the required shape and allowing metals to solidify. **Solidified** metal piece is called **casting**.

The plant which carries out the mould process is called **Foundry**.

Foundry is a place of collection of necessary materials tools and equipments to **produce castings**.

Sand Mould

Mould is a cavity of required shape made with casting sand called **green sand** or in other material.

The process of mould consists of all operations done to make a mould.

Pattern

Pattern is the model of required casting made in wood, metal or plastics.

It is used to produce mould cavity in green sand.

The process involved in **foundry** practice is

1. Mould Sand preparation
2. Pattern making
3. Core making
4. Mould making
5. Casting

PATTERN AND PATTERN MAKING

Pattern is one of the tools used for making cavity in sand mould. Molten metal is poured into the cavity to produce a casting.

Mould should be made

1. **Slightly larger** than the desired casting. To **meet out the allowances** of various type.

A Shrinkage allowance

B Machining or finishing allowance

C Draft or taper allowances

D Distortion or camber allowance

E Rapping or shake allowance.

Core and Core Prints

Mould may have several projections or bosses called core print.

Cores are separate entity in Mould pattern **to make recess, hole, pit, projection or blind whole etc in the casting.**

Mould also has extra projections to produce runner, raisers and gates that are useful during molding process

Factors to be considered in the selection of Pattern

According to usage and forms of the **selection of pattern** is done

- 1 size and complexity of the shape
2. Number of components to be produced
3. Method of casting to be used

Types of normal patterns used in Foundry

1. Solid and single piece pattern
2. Split pattern
3. Loose piece pattern
4. Match plate pattern

5. Sweep pattern
6. Skeleton pattern
7. Segmental pattern
8. Shell pattern

A. Single solid piece one piece pattern or Solid pattern

Without joints partings or loose piece only one number

Desired shape and size with some allowances - to make large size simple castings. Removal of pattern is easy

B. Split pattern

One pattern with complex geometry cannot be removed from mould if they are made by single piece. Split pattern is made into two parts. - One part produce the lower half and the other to produce upper half of mould. These two parts are assembled together in correct position by pins called dowel pins. Line which separated two parts is called parting line.

Used to make symmetrical shape castings. - Cylinders bearings and pulleys

If split pattern are made of three pieces then it is called three piece patterns.