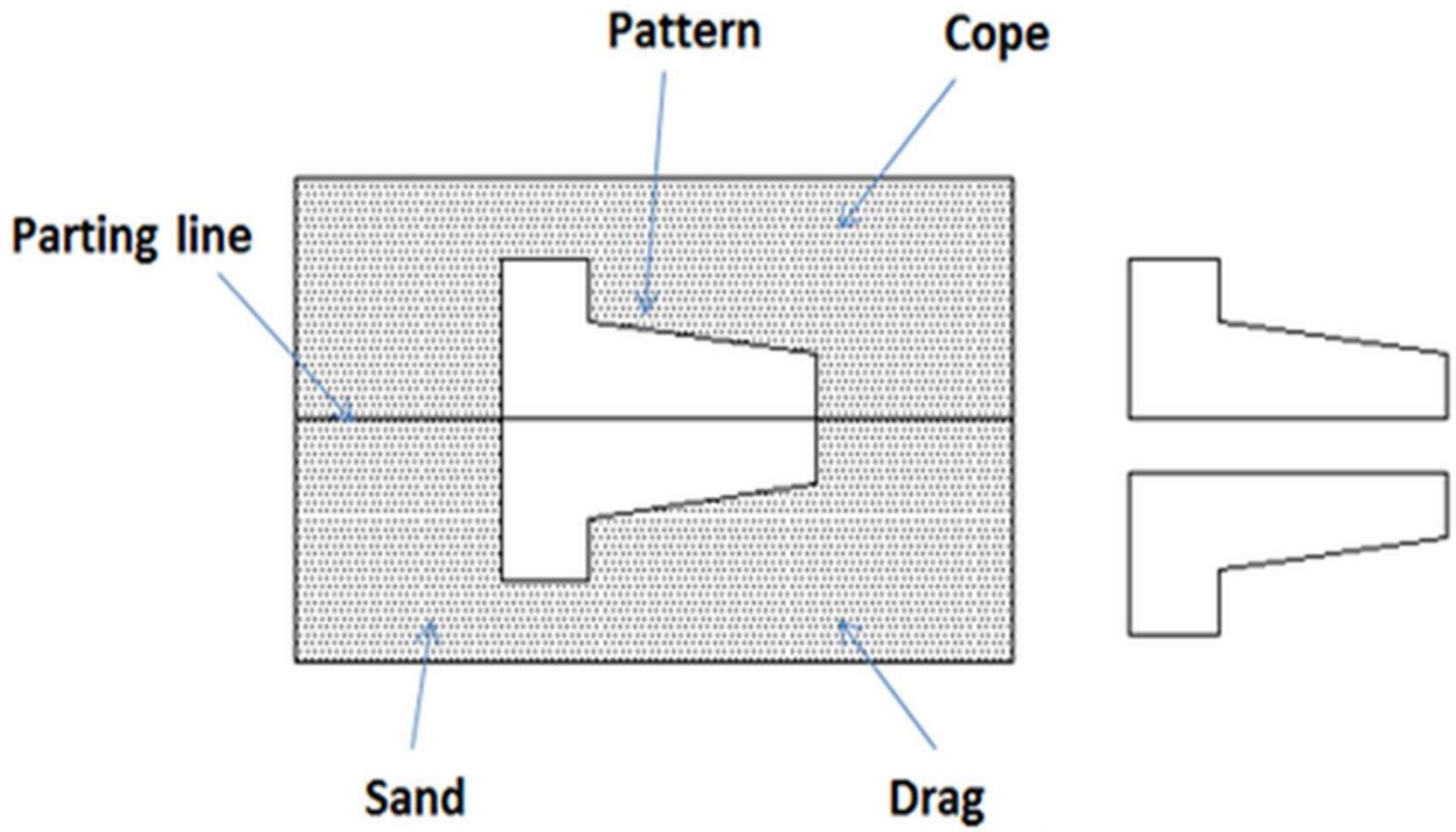


Casting

Casting process is one of the cheapest technique for producing desired product. This method involves pouring the molten metal into a mould cavity and allows it to solidify. This solidified object is taken out from the mould cavity either by breaking or taking the mold apart. This solidified object is called casting product and the technique is known as casting process.



PATTERN

- A pattern is a model or the replica of the desired product (to be casted). The pattern is then withdrawn for generating cavity (known as mold) in molding sand. Thus it is a mould forming tool.
- Pattern can be said as a model or the replica of the object to be cast except for the various allowances a pattern exactly resembles the casting to be made.
- When this mould/cavity is filled with molten metal, molten metal solidifies and produces a casting (product). So the pattern is the replica of the casting. A pattern prepares a mold cavity for the purpose of making a casting.

The materials used for making patterns are wood, metal, plastic, plaster, wax or mercury. The some important pattern materials are-

- Wood
- Plastic
- Wax
- Metal

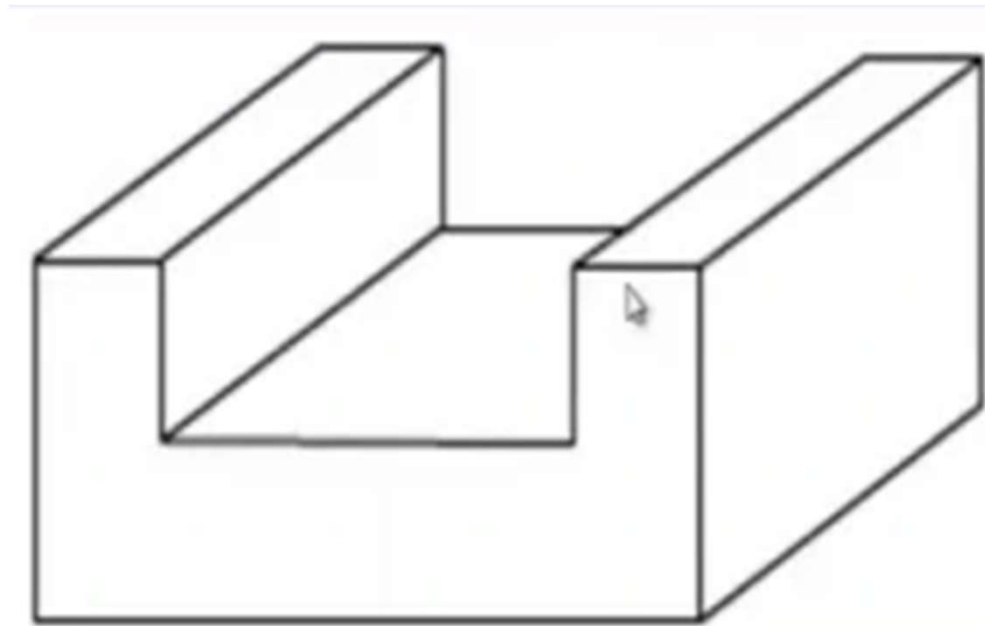
TYPES OF PATTERN

The types of the pattern and the description of each are given as under.

1. Single piece pattern
2. Two piece or split pattern
3. Multi- piece pattern
4. Loose piece pattern
5. Match plate pattern
6. Follow board pattern
7. Gated pattern
8. Sweep pattern
9. Skeleton pattern
10. Segmental or part pattern

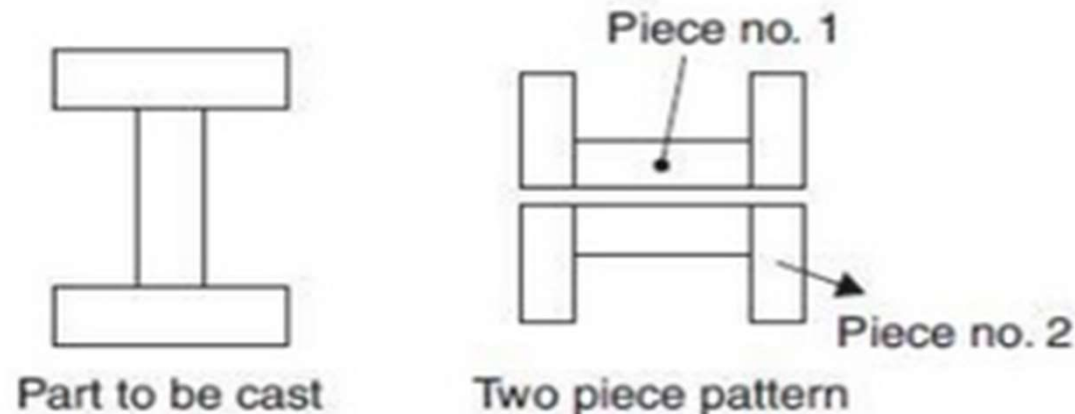
Single-piece or solid pattern

- Solid pattern is made of single piece without joints, partings lines or loose pieces. It is the simplest form of the pattern.



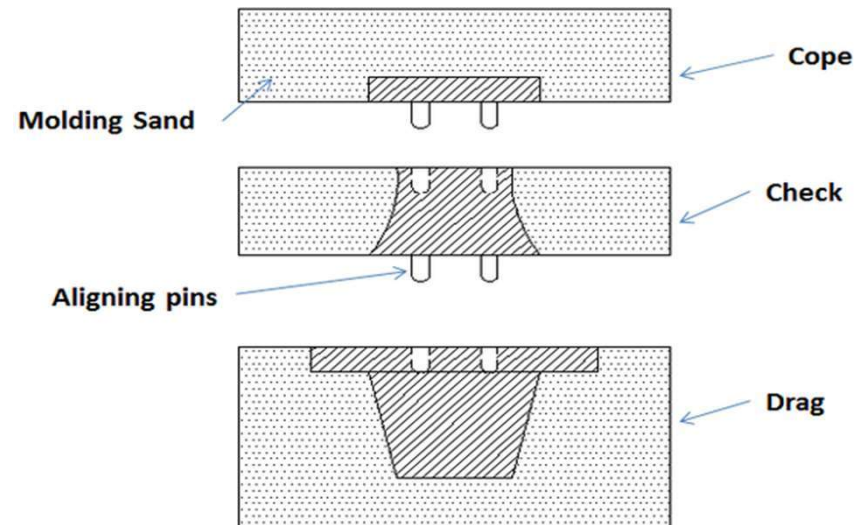
2. Two-piece or split pattern

When solid pattern is difficult for withdrawal from the mold cavity, then solid pattern is split in two parts. Split pattern is made in two pieces which are joined at the parting line by means of dowel pins. The splitting at the parting line is done to facilitate the withdrawal of the pattern.



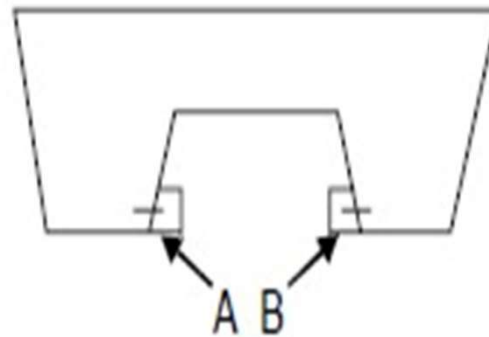
Three-piece or multi-piece pattern

Some patterns are of complicated kind in shape and hence can not be made in one or two pieces because of difficulty in withdrawing the pattern. Therefore these patterns are made in either three pieces or in multi-pieces. Multi molding flasks are needed to make mold from these patterns.



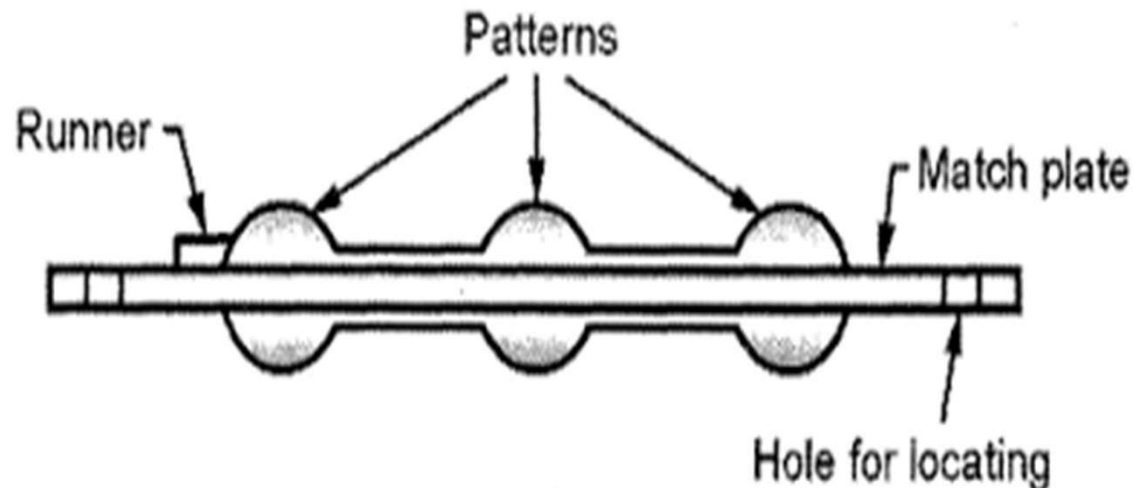
Loose-piece Pattern

- Loose piece pattern is used when pattern is difficult for withdrawal from the mould. Loose pieces are provided on the pattern and they are the part of pattern. The main pattern is removed first leaving the loose piece portion of the pattern in the mould. Finally the loose piece is withdrawal separately leaving the intricate mould.



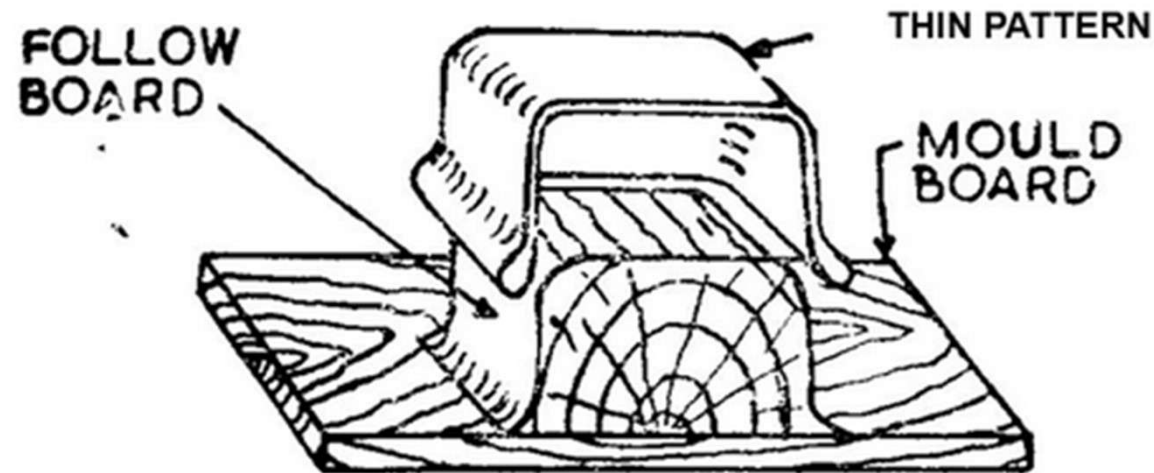
Match plate pattern

This pattern is made in two halves and is mounted on the opposite sides of a wooden or metallic plate, known as match plate. The gates and runners are also attached to the plate. This pattern is used in machine molding. A typical example of match plate pattern is shown in Fig.



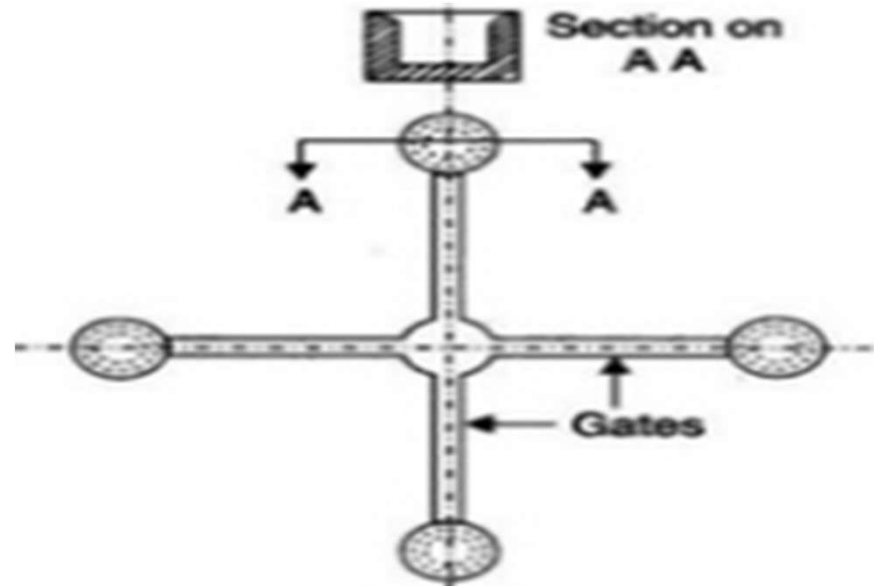
Follow board pattern

When the use of solid or split patterns becomes difficult, a contour corresponding to the exact shape of one half of the pattern is made in a wooden board, which is called a follow board and it acts as a molding board for the first molding operation.



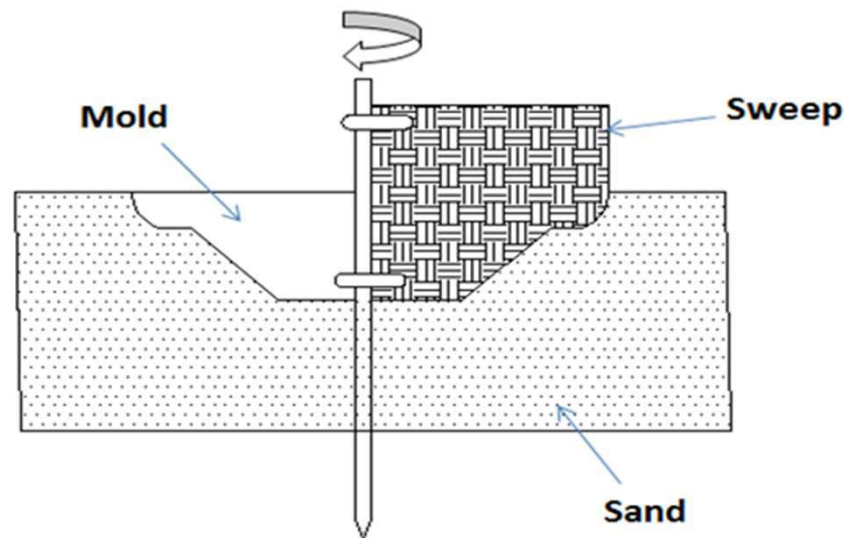
Gated pattern

In the mass production of casings, multi cavity moulds are used. Such moulds are formed by joining a number of patterns and gates and providing a common runner for the molten metal. These patterns are made of metals, and metallic pieces to form gates and runners are attached to the pattern.



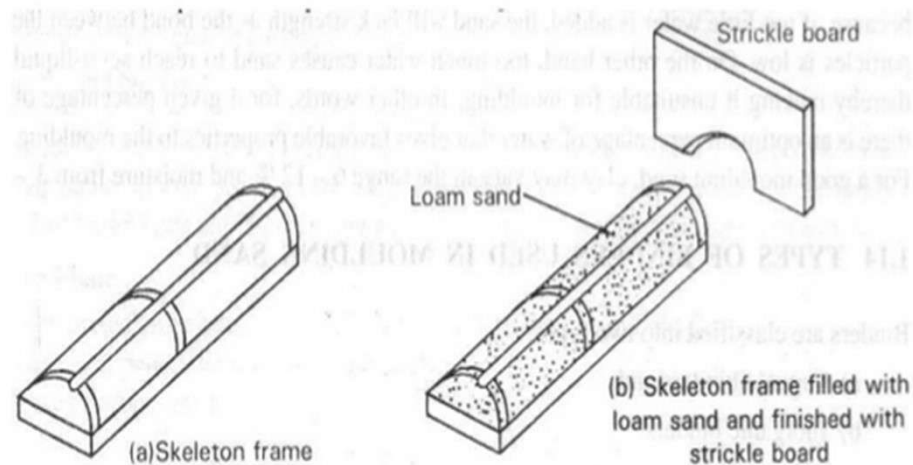
Sweep pattern

Sweep patterns are used for forming large circular moulds of symmetric kind by revolving a sweep attached to a spindle as shown in Fig. 4.10. Actually a sweep is a template of wood or metal and is attached to the spindle at one edge and the other edge has a contour depending upon the desired shape of the mould. The pivot end is attached to a stake of metal in the center of the mould.



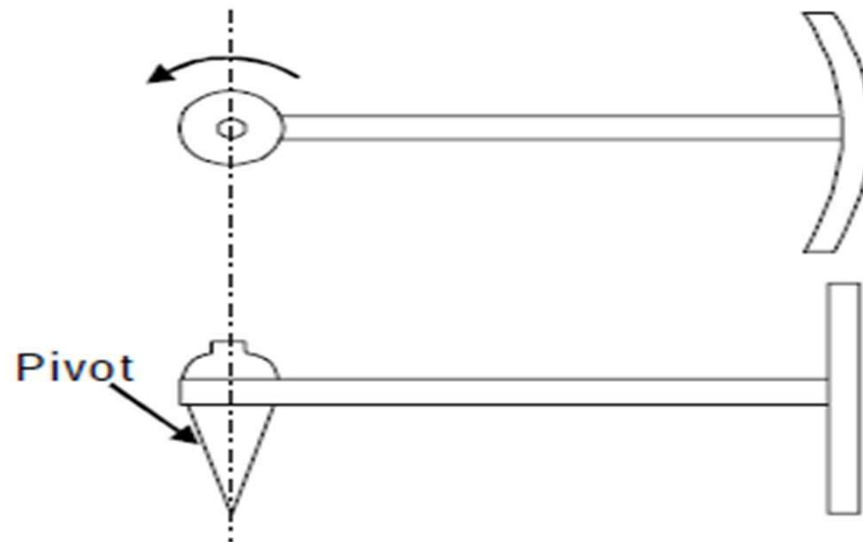
Skeleton pattern

When only a small number of large and heavy castings are to be made, it is not economical to make a solid pattern. In such cases, however, a skeleton pattern may be used. This is a ribbed construction of wood which forms an outline of the pattern to be made. This frame work is filled with loam sand and rammed. The surplus sand is removed by strickle board.



Segmental pattern

Patterns of this type are generally used for circular castings, for example wheel rim, gear blank etc. Such patterns are sections of a pattern so arranged as to form a complete mould by being moved to form each section of the mould. The movement of segmental pattern is guided by the use of a central pivot.



Steps in casting process

- 1) Prepare pattern
- 2) Place Pattern inside the molding box for creating cavity
- 3) Pour Molten Metal Into Mold Cavity
- 4) Solidify the molten metal
- 5) Fetling (Remove the solidified Metal)
- 6) Inspection of the casted product.

Pattern Making:

The pattern is the replica of the casting to be produced. Replica means the shape of the pattern is same as the shape of the casting to be produced.

Mould making:

After creating a pattern we need to create sand mould. The process of making a cavity or mold in the compact sand is called as Moulding. For creating a sand mould, the properties of green sand has to be known.

- **Pouring and Solidification:** After the creation of pattern, core as well as mould, the next step is to pour the molten metal into the sand molding. When the molten metal is poured, it will not move to each and every corner. Therefore, chills are provided at the corners to do the solidification fastly.
- **Fetling:** Fetling is nothing but, breaking of the mould after production of a component so as to take it out from the sand mould.
- **Inspection:** After production of component, it is inspected under the guidance of quality engineers and further it is sent to the machining shop where the surface finish of the component is to be done.