"ASSIGNEMENT-4"

Date 25/01/22
Page No.
Shivalal

"FOUNDRY"

Introduction :-

Foundry practice deals with the process of making castings in moulds formed in either sand or other material. The process involves the operations of pattern making, sand preparation, molding, melting of metal, pouring in moulds, Cooling, shake-out, Fettling heat treatment, Finishing and inspection.

Molding :- Molding is a process of making moulds. Moulds are classified as temporary and permanent.
Temporary Moulds are made of refractary and other binding Materials and may be produced through hand moulding or Machine moulding.

Moulding Sand :- The principal ingredients of moulding sands are : (i) Silica sand, (ii) clay (iii) moisture.

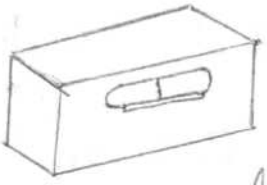
Tools and Equipments for Hand-Moulding :-

1. Sand preparation tools and Equipments
2. Moulding flask
3. Moulders tools.

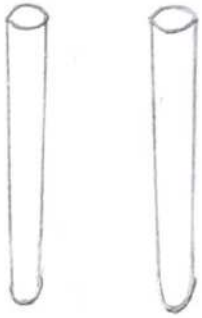
"Moulding Tools"

SLICKS

Leaf and spoon



Spirit Level



Runner and Riser

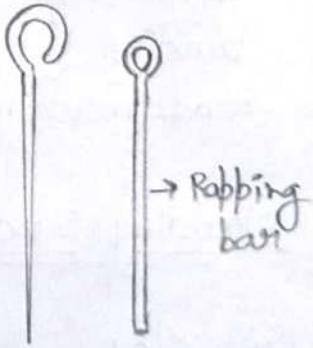
Square & Heart

Smoothers

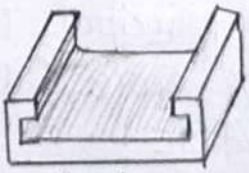
Button Smoother

Egg Smoother

Spoon and Bead

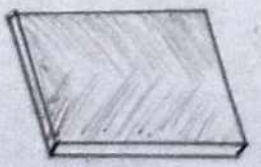


Drawn spike

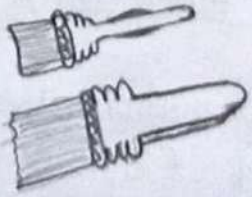


clamp

Stricker



Plainer



Hair brushes

Moulding Tools :-

① Slick :- It is a small double ended tool having flat on one end and a spoon on the other. It is used for mending and finishing small surfaces of mould.

② Shovel :- It is used for mixing and tempering moulding sand and for transferring the sand into the flask. It is made of broad steel blade with a wooden handle.

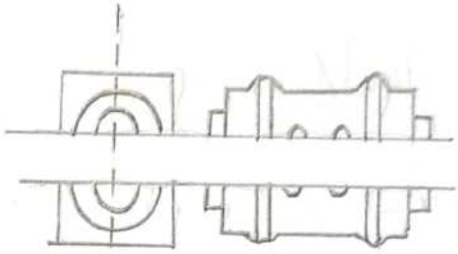
③ Sprue (Runner) Pin :- It is a tappered wooden pin, used to make holes in the cope through which the molten metal is poured in mould.

④ Riser Pin :- It is straight wooden pin used to make hole in the cope, over the mould cavity for the molten metal to rise in and feed the casting to compensate the shrinkage.

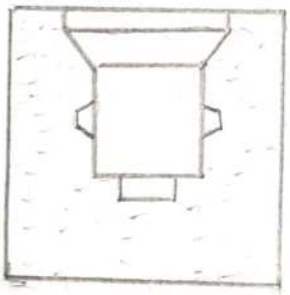
⑤ Trowel :- It conpists of a metal blade fitted into a wooden handle. It is used to smoothen surface of the mould.

⑥ Spike OR Draw Pin :- It is pointed steel rod with a loop at other end. It is used to remove the pattern from the mould.

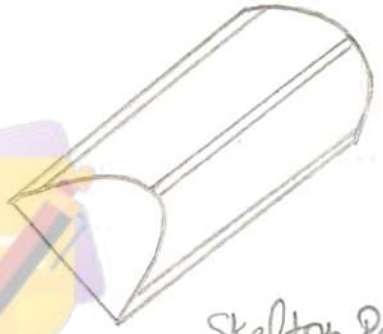
"Types of Patterns"



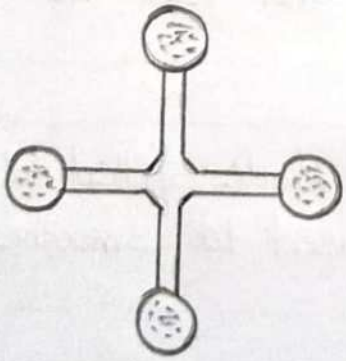
Split Pattern



Loose Piece Pattern



Skelton Pattern



Gated Patterns

Types of Patterns :-

① **Single Piece Pattern** :- This has a flat surface on the Cope side. This makes possible a straight line parting on the joint between the Cope and drag of the mould. It is used for making simple castings.

② **Split Pattern** :- Split Patterns are recommended for intricate castings, The two halves of the pattern are put together by dovel joint.

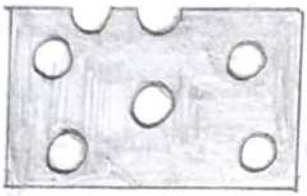
③ **Loose Piece Pattern** :- when a pattern cannot be drawn from the mould due to its complexity loose pieces are provided to facilates this. only two molding boxes are required on making a mould in this case.

Pattern Materials :-

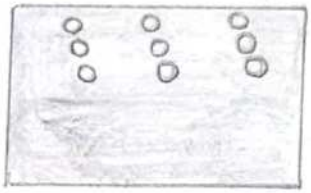
The following are the materials that are widely used for making patterns :

① Wood
② Metal and alloys
③ Plastics
④ Plasters and waxes.

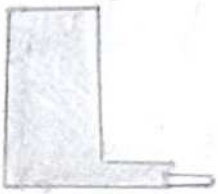
"Casting Defects"



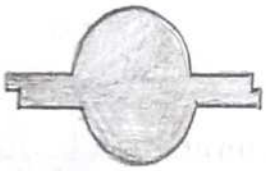
Blowholes



Pinholes

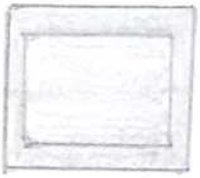


Misrun



shift or mismatch

Drop



Swell

Metal penetration

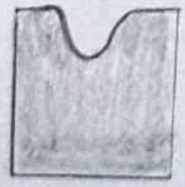
cold shut

Hot Tears

shrinkage cavity

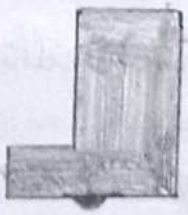
wash and cuts

Slag inclusion



Shrinkage cavity

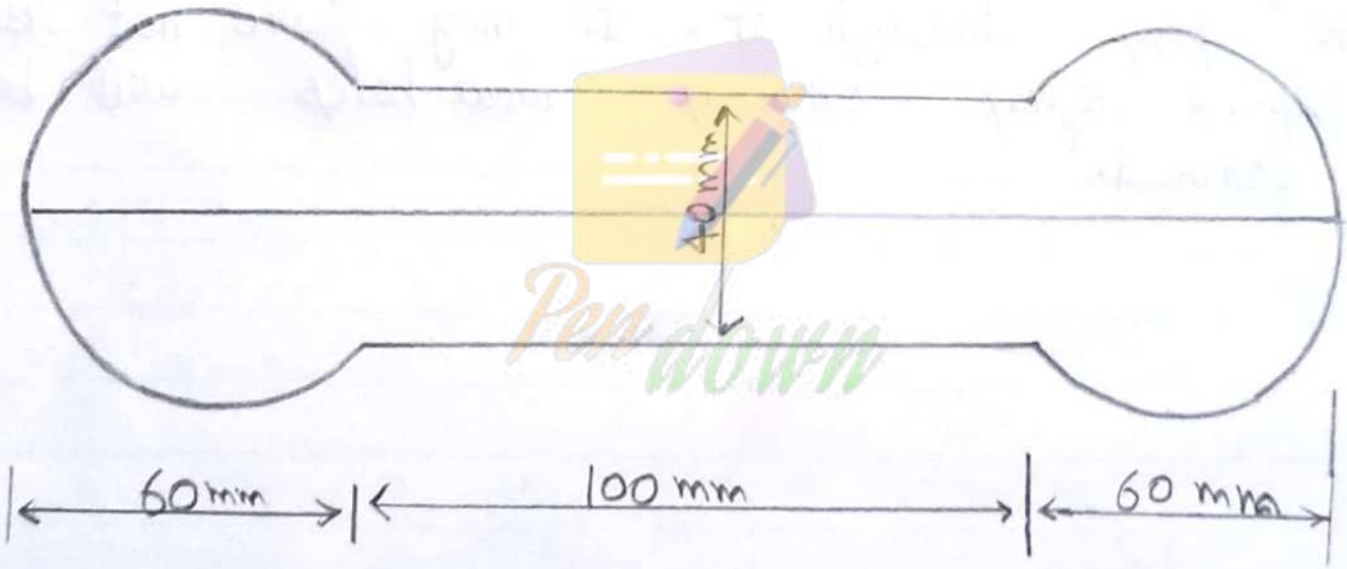
core shift



wash

Casting Defects :- When the molten metal is poured into a mould, gases and steam will be formed. The sand mould should have sufficient porosity to allow the gases and steam to pass through it. If they are not removed Casting defects such as blow holes will be formed.

DUMB-BELL



"Dumb - Bell"

Aim :- To make a sand mould using the bearing pattern.

Material Required :- Moulding sand, parting sand water.

Tool Required :- Flask (cope & drag), shovel, Hand rammer, Round rammer, strike off bar, vent-wire, Trowel, slick, Lifter, sprue & Flow off pins Hand riddle.

List of operations :-

1. Preparation of moulding sand
2. Compressing of sand over patterns.
3. withdrawl of pattern
4. Gate Cutting
5. Finishing of Moulding surface.

Procedure :-

S.No.	Operation	Description	Tools used
1)	Preparation of Moulding sand	• Copy the given drawing. • Collect Tools and materials • prepare the moulding sand and check quality	Moulding sand
2)	Compressing of sand over pattern	• Place the drag box keeping upside down and place pattern	

		• Fill the sand, ram by hand rammer and remove excess sand by using strike-off bar	Hand rammer, Strike off bar Flask
		• Keep the drag box in normal position and finished the surface, also make air vent holes	vent wire
		• Keep the top half of the pattern above the lower half and sprinkle parting sand.	parting sand
3)	withdrawl of pattern	• Fix the Cope box over the drag box and place the sprue pins and then fill the moulding sand.	Sprue & flow off pins
		• Remove excess sand and make air vent holes	
4)	Gate Cutting	• Remove sprue pins and detach Cope from drag. • Cut the gate on the drag box and withdraw the pattern	

5)	Finishing of moulding surface	Clean the mould cavity by lifters.	lifter

Result :- The sand mould of desired shape is obtained.

Precautions :- (1) Dress properly while working with molten metal.
(2) wear clear goggles and gloves.
(3) Never stand or look over the mold during the pouring or immediately after pouring because molten metal might spurt out of the mold.