

Workshop

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- 1) Sketch and explain mould preparation using single piece pattern?

MOULD PREPARATION USING SINGLE PIECE PATTERN

AIM: To prepare a sand mold, using the given single piece pattern.

Raw material required: Moulding sand, parting sand, facing sand, baking sand, single piece solid pattern, bottom board, moulding boxes etc

Tools Required:

- 1) Molding board 2) Drag and cope boxes
- 3) Molding sand 4) Parting sand
- 5) Rammer 6) Strike-off bar 7) Bellows
- 8) Riser and sprue pins 9) Gate cutter
- 10) Vent-rod 11) Draw spike 12) Wire Brush

Sequence of operations:

- 1) Sand preparation
- 2) Placing the mould flask (drag) on the moulding board/moulding platform
- 3) Placing the pattern at the centre of the moulding flask.
- 4) Ramming the drag
- 5) Placing runner and riser
- 6) Ramming the cope
- 7) Removal of the pattern, runner, riser.
- 8) Gate cutting.

Procedure: Mould Making

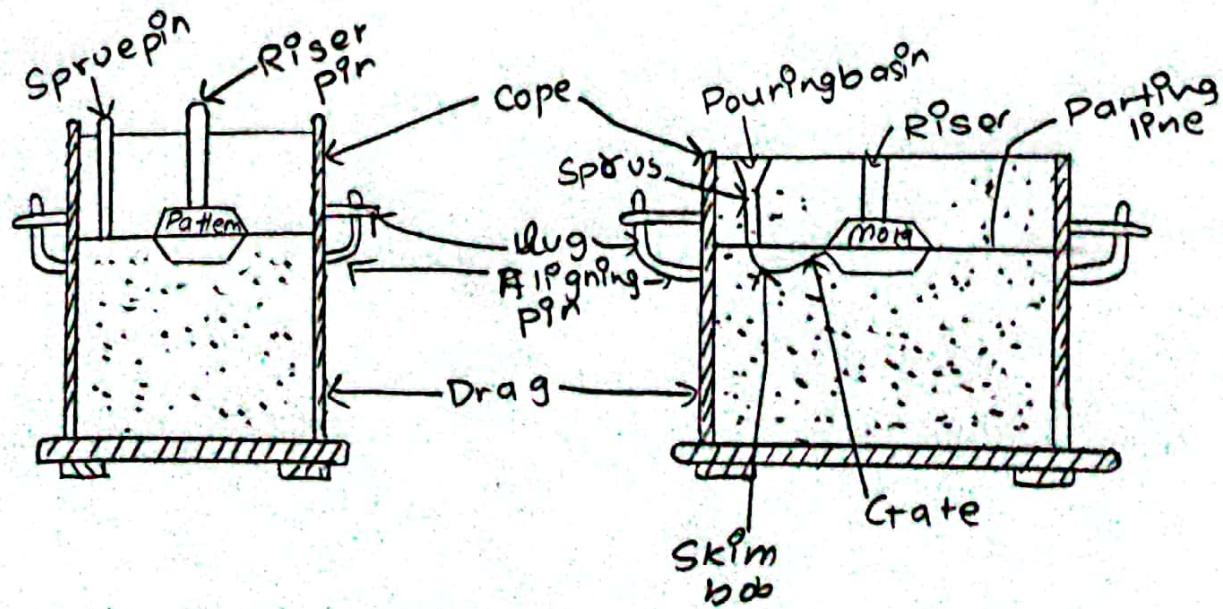
- 1) First a bottom board is placed either on the molding platform or on the floor, making the surface even.
- 2) The drag molding flask is kept upside down on the bottom board along with the drag part of the pattern at the centre of the flask on the board.
- 3) Dry facing sand is sprinkled over the board and pattern to provide a non-sticky layer.
- 4) Freshly prepared molding sand of requisite quality is now poured into the drag and on the pattern to a thickness of 30 to 50 mm.
- 5) Rest of the drag flask is completely filled with the backup sand and uniformly rammed to compact the sand.
- 6) After the ramming is over, the excess sand in the flask is completely scraped using a flat bar to the level of the flask edges.
- 7) Now with a vent wire which is a wire of 1 to 2 mm diameter with a pointed end, vent holes are in the drag to the full depth of the flask as well as to the pattern to facilitate the removal of gases during casting solidification. This completes the preparation of the drag.
- 8) Now finished drag flask is rolled over to the bottom board exposing the pattern.

- 8) Using a stick, the edges of sand around the pattern is repaired.
- 9) The cope flask on the top of the drag is located aligning again with the help of the pins of the drag box.
- 10) Sprue of the gating system for making the sprue passage is locked at a small distance of about 50mm from the pattern. The sprue base, runners and in-gates are also located as shown risers are also placed. Freshly prepared facing sand is poured around the pattern.
- 11) The molding sand is then poured in the cope box. The sand is adequately rammed, excess sand is scraped and vent holes are made all over in the cope as in the drag.
- 12) The sprue and the riser are carefully withdrawn from the flask.
- 13) later the pouring basin is cut near the top of the sprue.
- 14) The cope is separated from the drag. Any loose sand on the cope and drag interface is blown off with the help of the bellow's
- 15) Now the cope and the drag pattern halves are withdrawn by using the draw spikes and rapping the pattern all around to slightly enlarge the mould cavity so that the walls are not spoiled by the withdrawing pattern.
- 16) The runners are to be removed or to

Cut in the mould carefully without spoiling the mould.

- 18) Any excess or loose sand is applied in the runners and mould cavity is blown away using the bellows.
- 19) Now the facing paste is applied all over the mould cavity and the runners which would give the finished casting a good surface finish.
- 20) A dry sand core is prepared using a core box. After suitable baking it is placed in the mould cavity.
- 21) The cope is placed back on the drag taking care of the alignment of the two by means of the pins.
- 22) The mould is ready for pouring molten metal. The liquid metal is allowed to cool and become solid which is the casting desired.

Result: The required mould cavity is prepared using the given single solid pattern.



Q) Sketch and explain mould preparation using split pattern?

MOULD PREPARATION USING SPLIT PATTERN

AIM:- To prepare a sand mold, using the given split-piece pattern

Raw Material required: Molding sand, Parting sand, facing sand, baking sand Pattern, bottom board, moulding boxes.

Tools Required.

- 1) Molding board 3) Drag and cope boxes
- 2) Molding sand 4) Parting sand
- 5) Rammer 6) Strike-off bar 7) Bellows
- 8) Riser and sprue pins 9) Gate cutter
- 10) Vent rod 11) Draw spike 12) Wire brush

Sequence of operations:

- 1) Sand preparation
- 2) Placing the mould flask (drag) on the moulding board/moulding platform
- 3) Placing the split pattern at the centre of the moulding flask.
- 4) Ramming the drag.
- 5) Placing the pattern at the centre of the moulding flask (copebox)
- 6) Placing runner and riser
- 7) Ramming the cope
- 8) Removal of the pattern, runner, riser
- 9) Gate cutting.

Procedure: Mould Making.

- 1) First a bottom board is placed either on the molding platform or on the floor, making the surface even.
- 2) The drag molding flask is kept upside down on the bottom board along with the drag of the pattern at the centre of the flask on the board.
- 3) Dry facing sand is sprinkled over the board and pattern to provide a non-sticky layers.
- 4) Freshly prepared molding sand of requisite quantity is now poured into the drag of the split-pattern to a thickness of 30 to 50mm.
- 5) Rest of the drag flask is completely filled with the backup sand and uniformly rammed to compact the sand.
- 6) After the ramming is over, the excess sand in the flask is completely scraped using a flat bar to the level of the flask edges.
- 7) Now with a vent wire which is a wire of 1 to 2 mm diameter with a pointed end, vent holes are in the drag to the full depth of the flask as well as to the pattern to facilitate the removal of gases during casting solidification. This completes the preparation of the drag.
- 8) Now finished drag flask is rolled over to the bottom board exposing the pattern.

- 9) Using a stick, the edges of sand around the pattern is repacked and cope half of the pattern is placed over the drag pattern, aligning it with the help of dowel pins.
- 10) The cope flask on the top of the drag is located aligning again with the help of the pins of the drag box.
- 11) Dry parting sand is sprinkled all over the drag surface and on the pattern.
- 12) Sprue of the gating system for making the sprue passage is located at a small distance of about 50 mm from the pattern. The sprue base, runners and ingates are also located as shown risers are also placed. Freshly prepared facing sand is poured around the pattern.
- 13) The moulding sand is then poured in the cope box. The sand is adequately rammed, excess sand is scraped and vent holes are made all over in the cope as in the drag.
- 14) The sprue and the riser are carefully withdrawn from the flask.
- 15) later the pouring basin is cut near the top of the sprue.
- 16) The cope is separated from the drag any loose sand on the cope and drag interface is blown off with the help of the bellows.
- 17) Now the cope and the drag pattern halves are withdrawn by using the

draw spikes and rapping the pattern all round to slightly enlarge the mould cavity so that the walls are not spoiled by the withdrawing pattern.

- 18) The runners and gates are to be removed or to be cut in the mould cavity carefully without spoiling the mould.
- 19) Any excess or loose sand is applied in the runners and mould cavity is blown away using the bellows.
- 20) Now the facing paste is applied all over the mould cavity and the runners which would give the finished casting a good surface finish.
- 21) A dry sand core is prepared using a core box. After suitable baking, it is placed in the mould cavity.
- 22) The cope is placed back on the drag taking care of the alignment of the two by means of the pins.
- 23) The mould is ready for pouring molten metal. The liquid metal is allowed to cool and become solid which is the casting desired.

Result

The required mould cavity is prepared using the given split pattern as shown in fig:

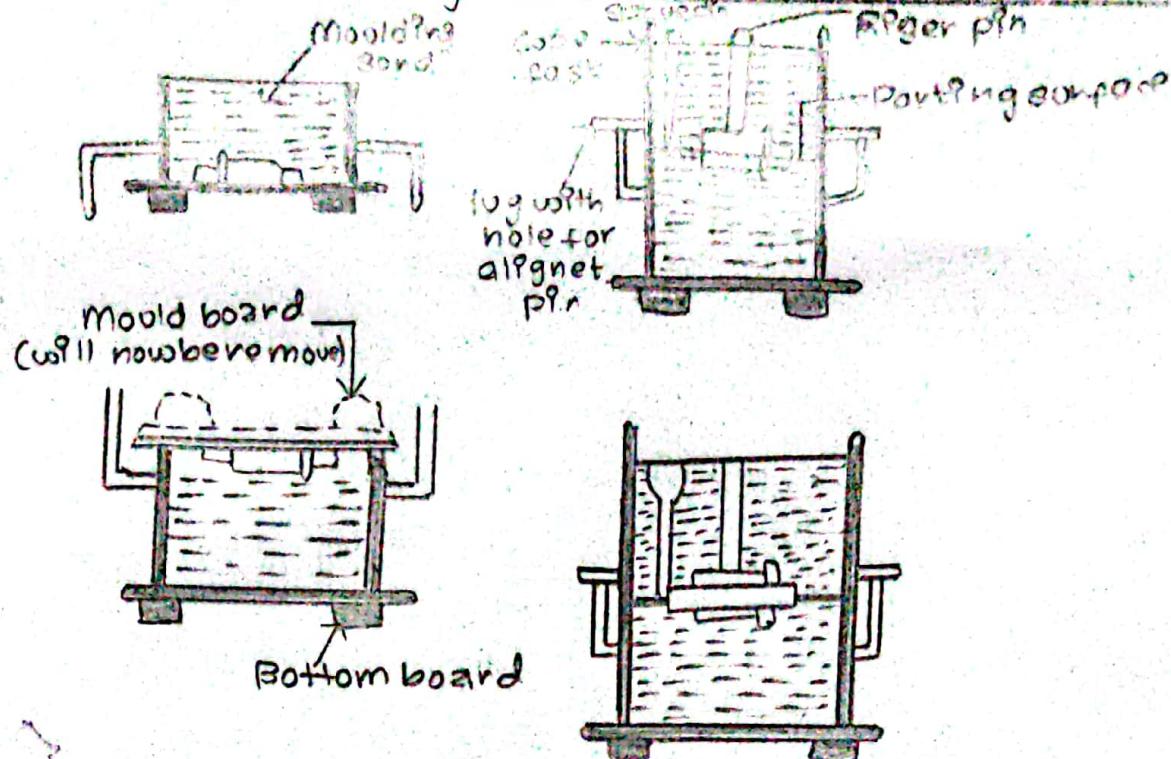


fig: sand mould making procedure

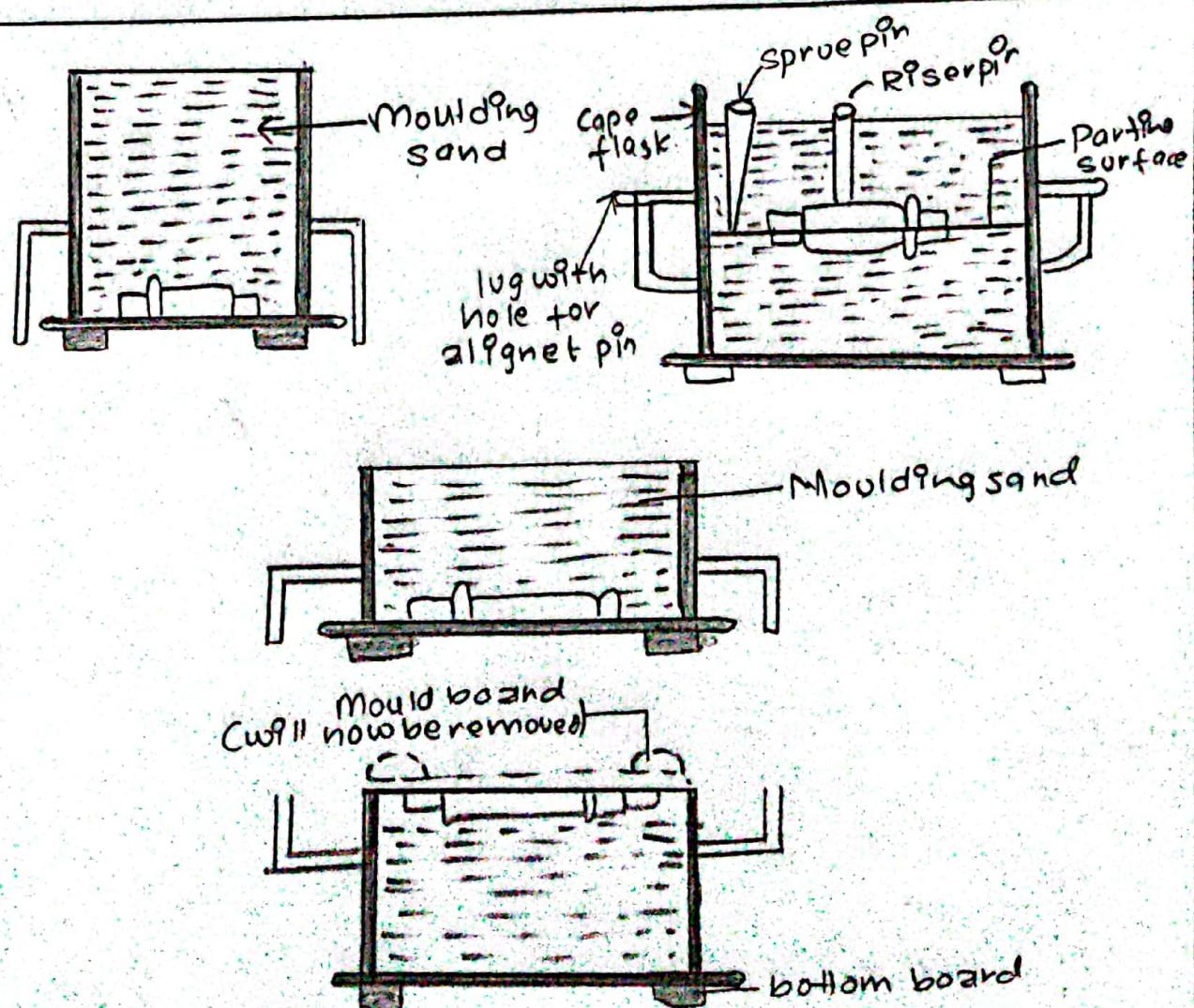


fig: Preparation of the mold using split pattern