

Moulding Sand:

| | | | | |
|------|-----------|---|--------|--------------------|
| Sand | Silica | — | 70-85% | |
| | Clay | — | 10-20% | — Bonding Material |
| | Water | — | 2-8% | |
| | Additives | — | 1-4% | |

Silica — 1710°C — Refractory Temperature

Olivine — 1800°C

Refractoriness Temperature

Zirconium — 2700°C

Ceramic — 3500°C

Graphite — 4200°C

Refractoriness $>$ Pouring Temp. of
Liquid Metal

Additives used in moulding Sands:-

Saw dust
or
Wood Powder/Flour

Collapsibility (&) Permeability

Linseed oils,
Molasses, dextrin

Mould Hardness

Coal dust &
Graphite

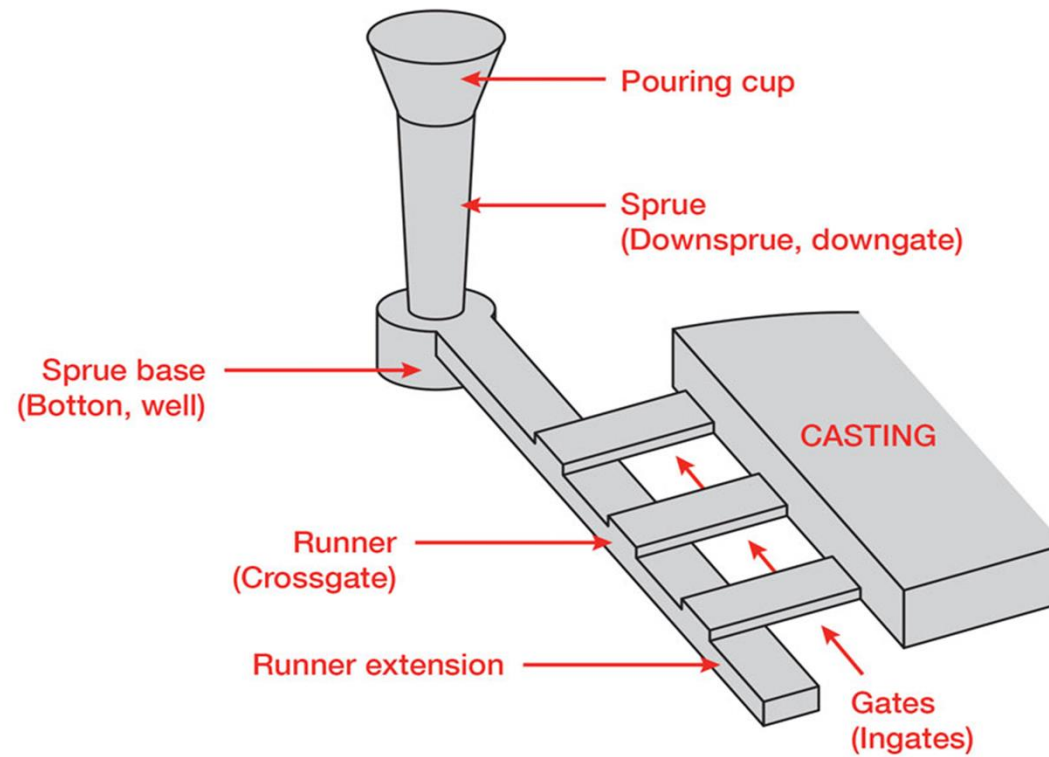
Surface finish (&) Refractoriness

Gating system

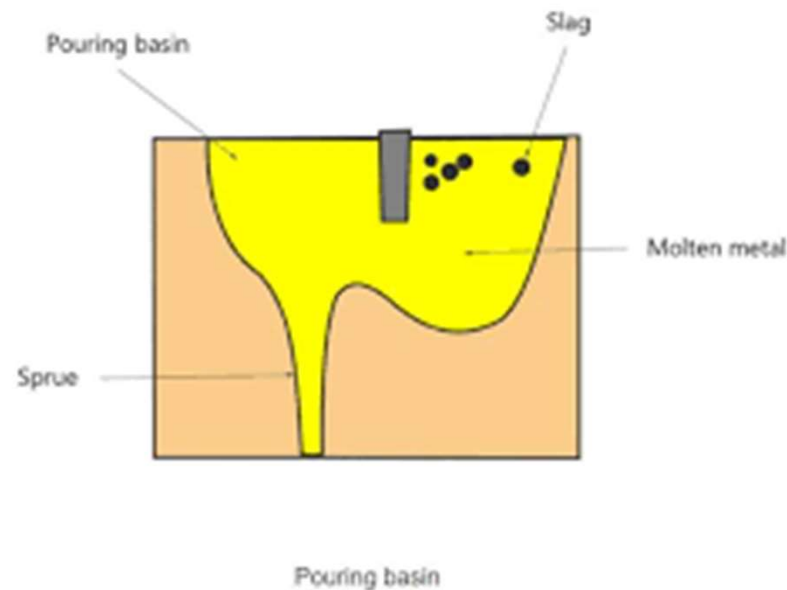
Gating system refers to all those elements which are connected with the flow of molten metal from the ladle to the mould cavity. The various elements that are connected with the gating system are:

- Pouring Basin
- Sprue
- Sprue-base well
- Runner
- Runner Extension
- In-gate
- Riser

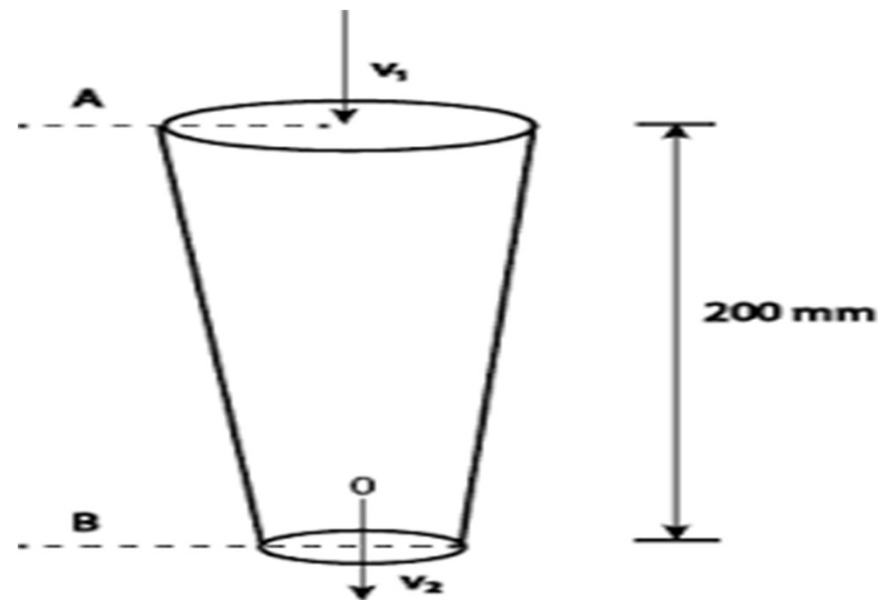
Gating system



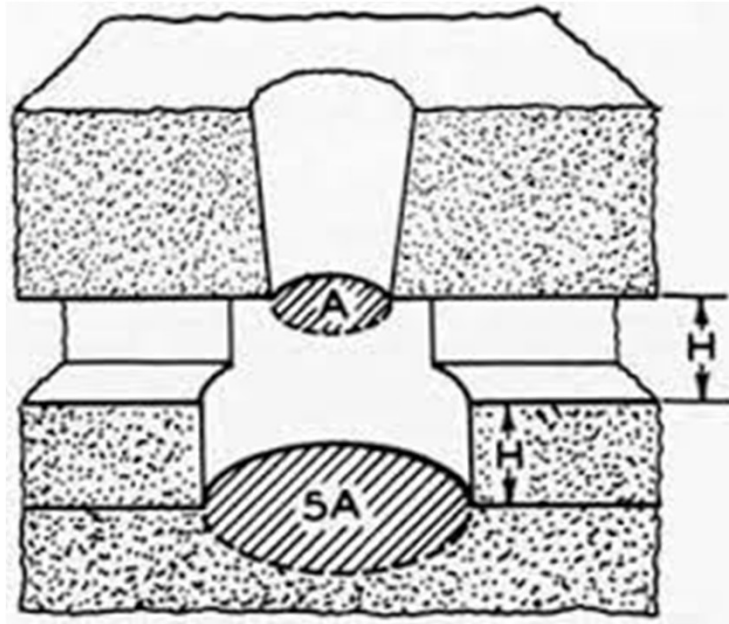
Pouring Basin: In order to avoid mould erosion, molten metal is poured into a pouring basin, which acts as a reservoir from which it moves smoothly into the sprue. The pouring basin is also able to stop the slag from entering the mould cavity by means of a skimmer or skim core.



Sprue: It is the channel through which the molten metal is brought into the parting plane, where it enters the runners and gates to ultimately reach the mould cavity. If the sprue were to be straight- cylindrical then the metal flow would not be full at the bottom to avoid this problem the sprue is designed taper.



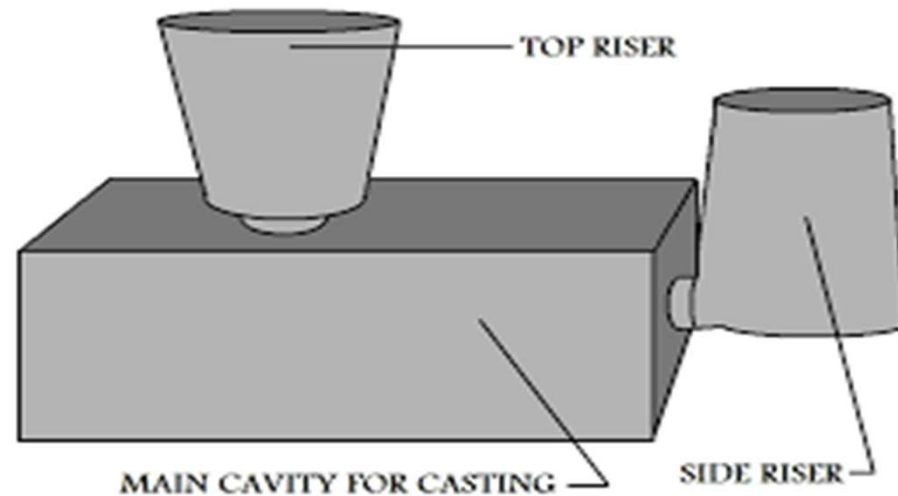
Sprue Base Well: This is a reservoir for metal at the bottom of the sprue, to reduce the momentum of the molten metal.



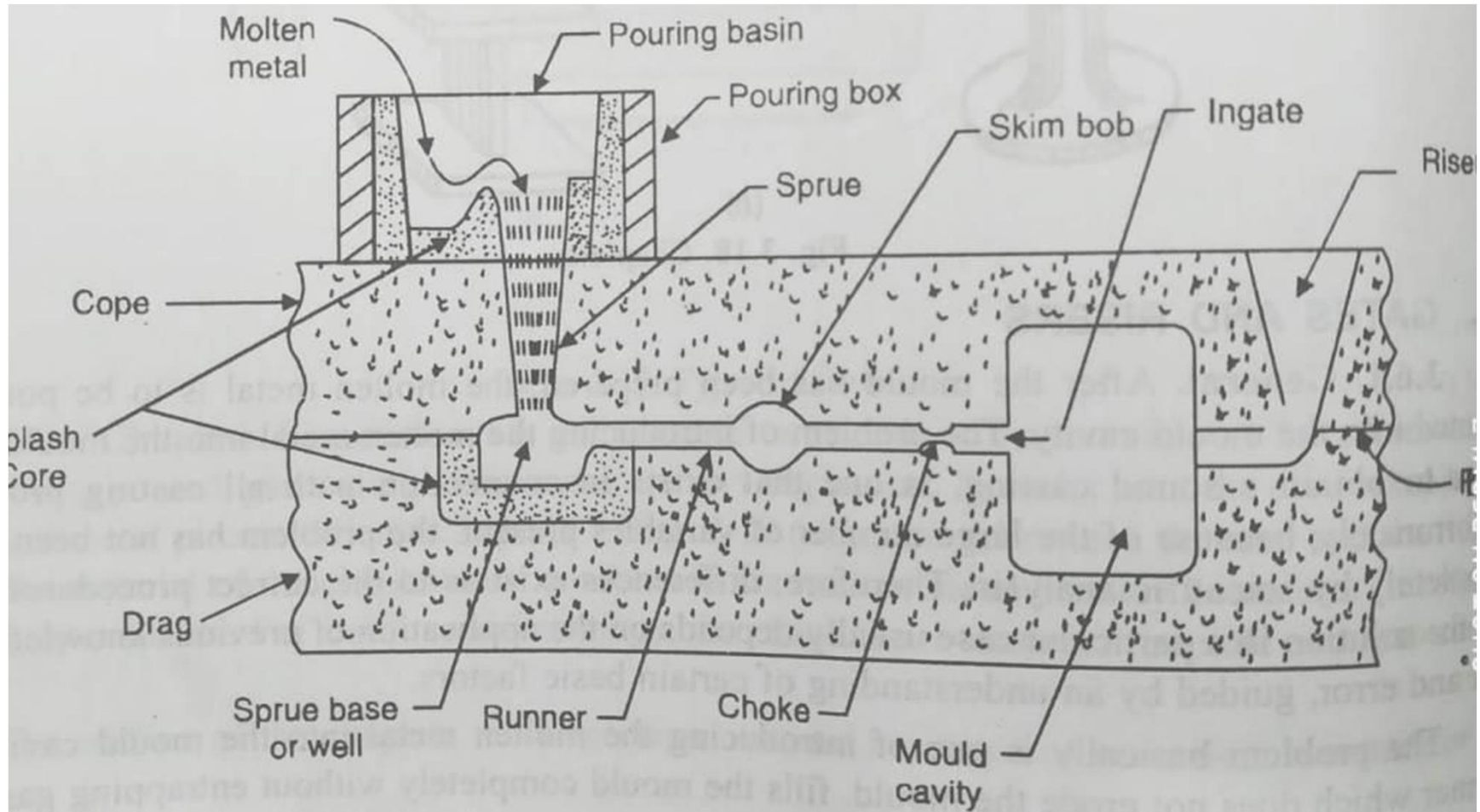
Runner : The runner takes the molten metal from sprue to the casting. Ingate: This is the final stage where the molten metal moves from the runner to the mold cavity.



Riser: Riser is a source of extra metal which flows from riser to mold cavity to compensate for shrinkage which takes place in the casting when it starts solidifying. Without a riser heavier parts of the casting will have shrinkage defects, either on the surface or internally.



Working process



Riser Design

- The riser is a reservoir in the mold that serves as a source of liquid metal for the casting to compensate for shrinkage during solidification.
- The riser must be designed to freeze after the main casting in order to satisfy its function.
- Riser is used in a sand- casting mold to feed liquid metal to the casting during freezing in order to compensate for solidification shrinkage.
- To function, the riser must remain molten until after the casting solidifies.
- Chvorinov's rule can be used to compute the size of a riser that will satisfy this requirement.