GATING SYSTEM

- The passage way through which the metal enters the mould cavity is known as Gating or Gating system. The main Elements of Gating system are:-

1) Pouring Basin.
2) Sprue.
3) Runner
4) Ingate
5) Gate
6) Riser

1) **Pouring Basin :-**

It is a funnel-shaped opening in the upper surface of the cope above the sprue. The main purpose of pouring basin is to establish a proper flow system as rapidly as possible.

2. **Sprue :-**

It is a vertical opening (usually tubular) through the cope. It connects pouring basin to the runner or gate.

3. **Runner :-** The molten metal is usually carried from the sprue base to several gates around the cavity through a passage-way, called the runner.

4. Ingate :-

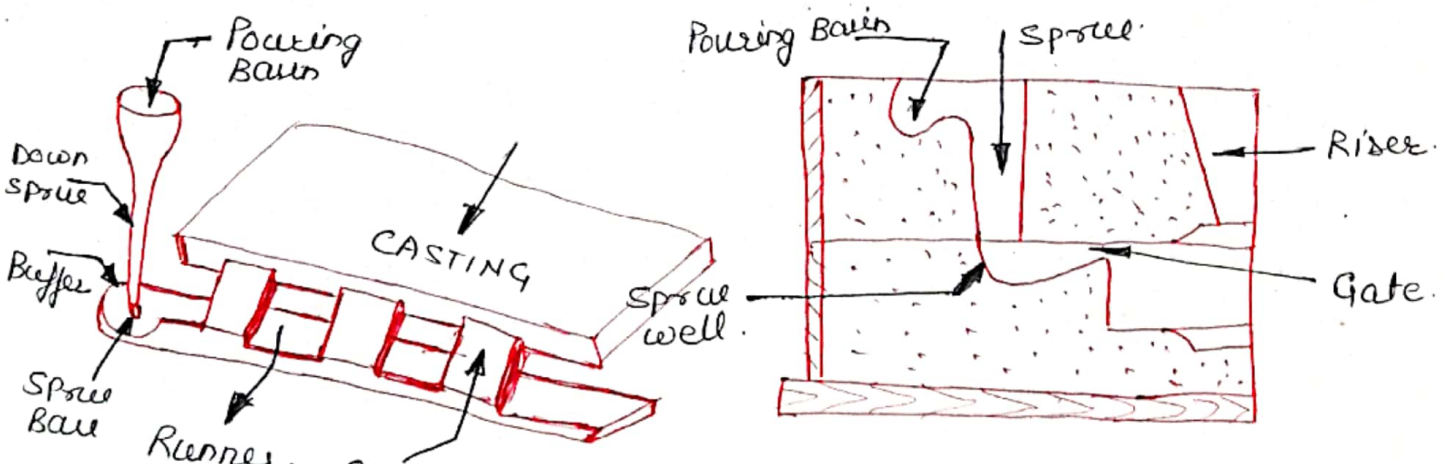
An ingate is an opening (usually horizontal) which carries the metal to the mould cavity.

5. Gate :-

The gate is the passage that finally leads molten metal from the runner into mould cavity. The location and size of the gates are so arranged that they can feed liquid metal to the casting at a consistent rate with the rate of solidification.

6. Riser :-

It is an opening through the cope. Its main purpose is to feed molten metal to the casting as it solidifies to compensate for the shrinkage. It also serve as vent for escaping of generated steam and other gases.



GATING SYSTEM

CASTING DEFECTS

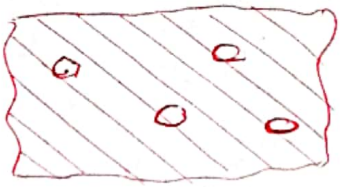
A large number of defects occur in sand castings. The factors which are normally responsible for the prodn of these defects are :-

(i) Design of casting.
(ii) Design of Pattern equipment.
(iii) Moulding and Core making equipment.
(iv) Mould and Core Materials.
(v) Gating and Risering

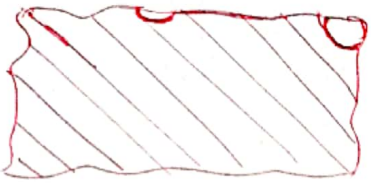
(i) **Blow holes and open blows :-**

These are the spherical flattened or elongated cavities present inside the castings or on the surface. when cavities are present on the surface, they are called open holes and when they are present inside, they are called blow holes.

These are formed, by the moisture left in the mould and the core. By heating the molten metal, the moisture is converted into steam, part of which when entrapped in the casting ends up as blow hole and when reached upto the surface called as open blow.



Blow holes
or
Gas holes



open blow.

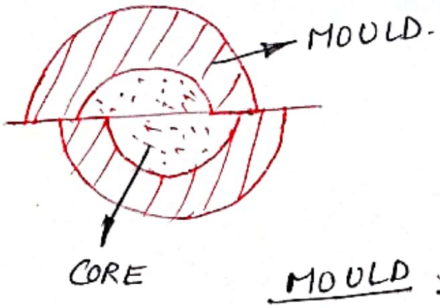
2. MOULD SHIFT:-

Mould shift results in a mismatching of the top and bottom parts of a casting, usually at the parting line. It occurs due to following reasons:—

(a) Misalignment of pattern parts, due to worn or damaged pattern.

(b) Misalignment of Moulding Box.

This defect can be prevented by ensuring Proper alignment of the pattern, moulding Boxes, correct mounting of pattern on pattern plates etc.



MOULD SHIFT

3. CORE SHIFT:- It is an abnormal variation of the dimensions which are dependent on core position. It is caused by.

(a) Misalignment of cores in assembling core - moulds.

(b) Undersized or oversized coreprints.

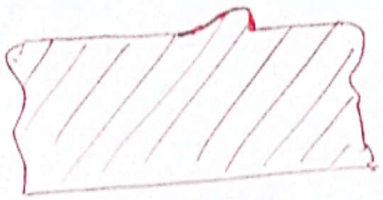
(c) By using incorrect size of chaplet.

This defect can be Eliminated by providing the core at the proper place and must be gripped properly in the sand.

MOULD SHIFT

4. DROP :-

An irregularly - shaped projection on the cope surface of a casting is called a drop. This is caused by dropping of sand from the cope or other overhanging projections into the mould.



DROP

5. HOT TEAR :-

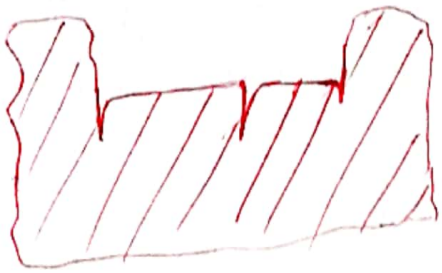
It is an internal or external ragged discontinuity in the metal casting resulting from hindred contraction occuring just after the metal has solidified. This defect is due to the following reasons :-

(a) Abrupt changes in section, inadequate fillating of inside corners.

(b) Improper pouring temperature.

(c) Poor collapsibility of mould and core materials which will place extra stresses on certain details.

In order to prevent this defect, abrupt change in section should be avoided. The pouring temperature should be correct and there should be even rate of cooling.

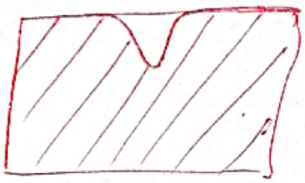


HOT TEAR

6. SHRINKAGE :-

It is a crack in the casting or on the surface of casting which results from unequal contraction of the metal during solidification. This is due to the following reasons:-

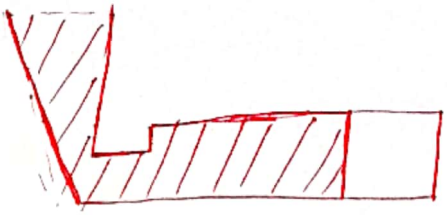
(a) Improper location and size of gates and runners.
(b) Inadequate risers.
(c) Lack of directional solidification.
(d) Incorrect pouring temperature.



SHRINKAGE CAVITY

7. MISRUN :-

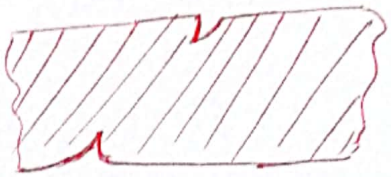
This defect is incomplete cavity filling. Many times, the liquid metal, due to insufficient superheat, start freezing before reaching the farthest point of the mould cavity.



MISRUN

8. BUCKLE :-

A buckle is a long, fairly shallow, broad, Vee depression that occurs in the surface of the casting. It occurs due to sand expansion caused by the heat of the metal. At high temperature, an expansion of the thin layer of sand at the mould face takes place before the liquid metal at the mould face solidifies. As this expansion is obstructed by the flask, the mould tends to bulge out, forming the vee-shape.



BUCKLE

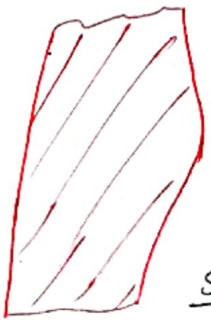
9. RAT TAIL:-

It is a long, shallow, angular depression normally found in a thin casting. The reason of formation of Rat tail is same as buckle i.e sand Expansion due to heat of the metal. Here instead of expanding sand upheaving, the compressed layer fails by on layer. gliding over the other.

RAT TAIL

10. SWELL:-

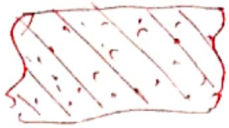
A swell is a slight, smooth bulge found on vertical face of casting resulting by the hydrostatic Pressure caused by the high moisture content in sand.



SWELL

11. POROSITY:-

Porosity indicates very small holes uniformly dispersed throughout a casting. It occurs when there is a decrease in gas solubility during solidification.



POROSITY