

Casting Defects

- 1) Porosity
- 2) Shrinkage
- 3) Cuts and Washes
- 4) Swells
- 5) Rat Tails
- 6) Misruns
- 7) Cold shuts
- 8) Hot Tears
- 9) Mismatch

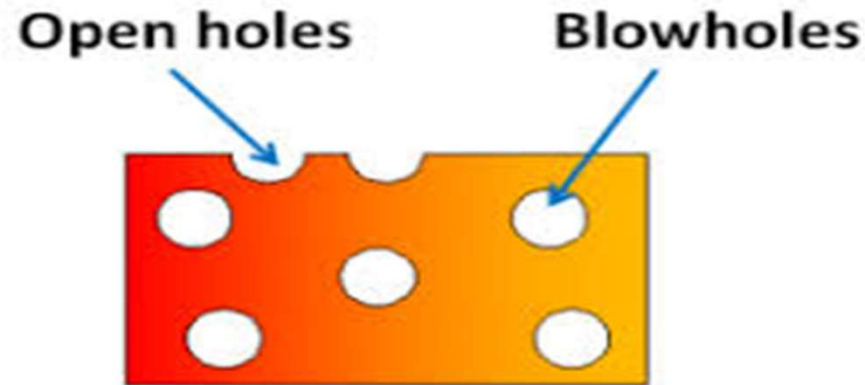
Porosity

Porosity takes place on casted metal when gasses (like nitrogen, oxygen or hydrogen) trap during casting. The casting defect appears on metals as small holes, rounded, or circular cavities.

Gas porosity casting defects are classified into two part-:

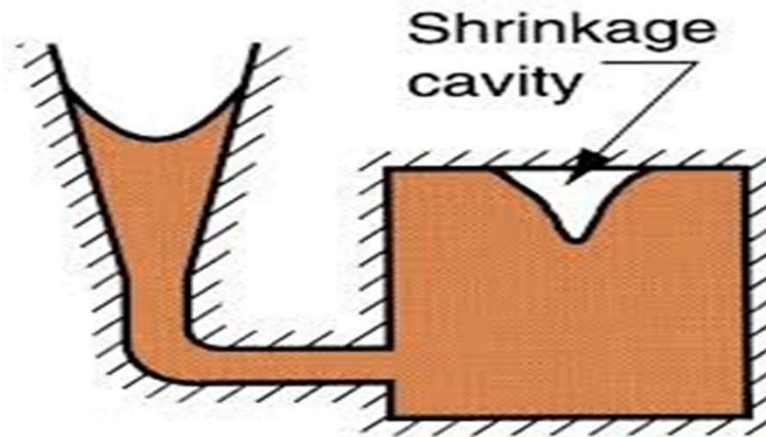
(i) Pinholes

(ii) Blowhole



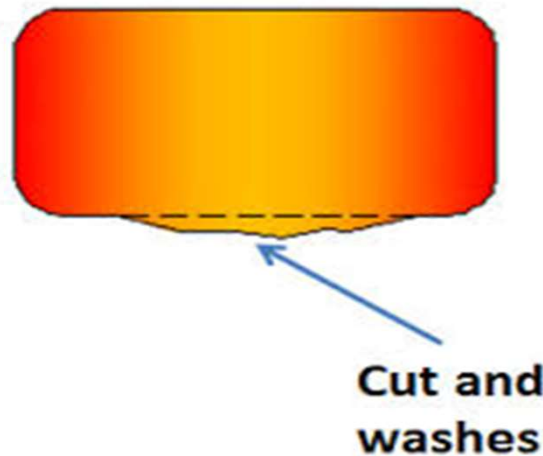
Shrinkage

This type of casting defects occurs during the solidification of the casting. This casting defect might also be paired with cracks. Shrinkage with large cavities can cause the casting to eventually break under stress. This defect should always be expected during solidification.



Cuts and Washes

Cuts and washes can be caused by molten metal flowing at a high velocity, causing too much metal to flow through the gate. A cut appears as a low projection along the surface of the drag face, decreasing in height as it extends from one side of the casting to the other.



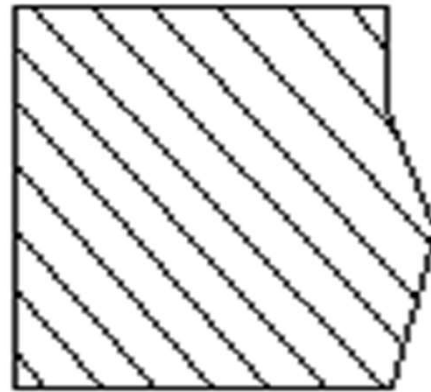
Rat Tails

This casting defect occur in the casting as an irregular line or cracks. The rat tail appear on casting when hotness of the metal causes the sand to expand which may be caused by poor expansion properties of the sand, hot pouring temperature of metal, and poor design.



Swells

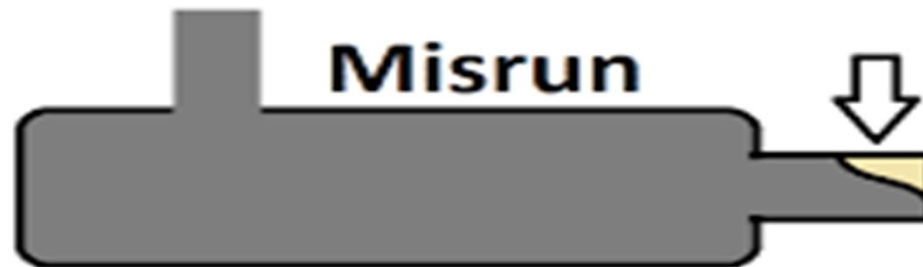
Swells typically take on the shape of a slight, smooth bulge on the vertical face of castings. Swells are an enlargement of the casting. Swell is usually caused by improper or soft ramming of the mold or a low strength mold. Swells can be neglected by using a strong, properly rammed mold.



Swell

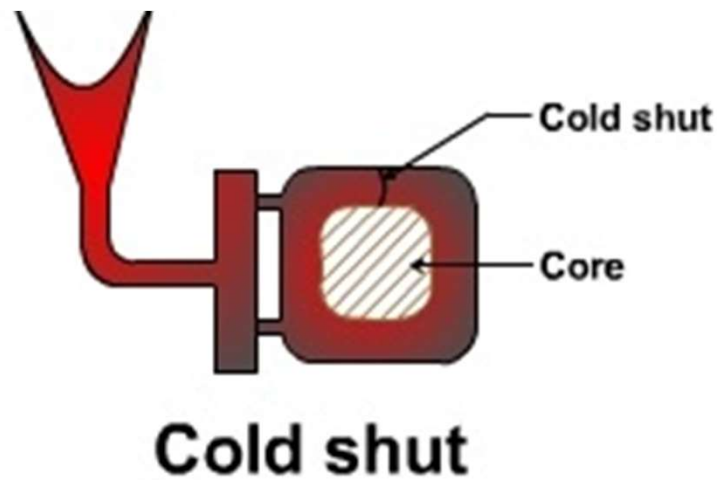
Misruns

The liquid metal does not completely fill the mold cavity. The misrun is the unfilled portion or space in the mold. Misruns occur due to lack of fluidity, Faulty design, Faulty gating.



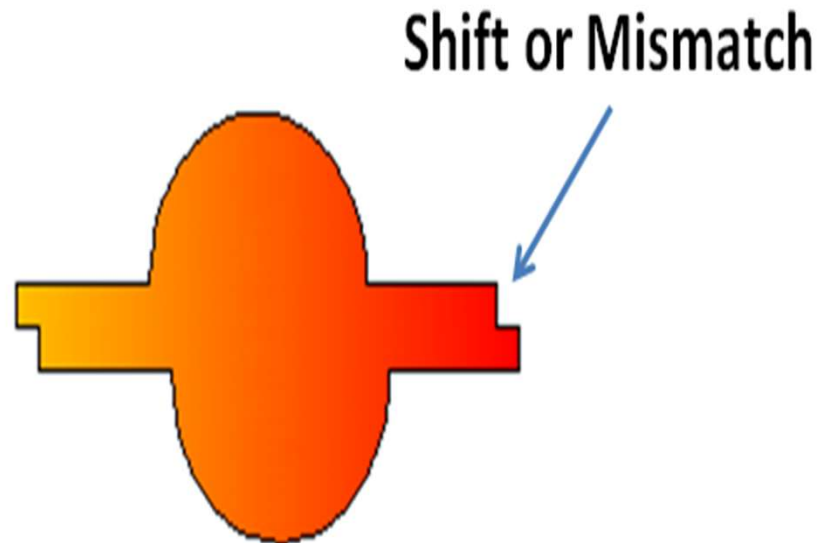
Cold shut

It appear on the surface of the casting. The defect leads to full rejection of casting because it creates a weak spot. It is caused when molten metal enters the mold from two gates, the steams will meet at a junction. Low temperatures can prevent fusion at the junction, causing the steams to solidify before fusion, creating a cold shut.



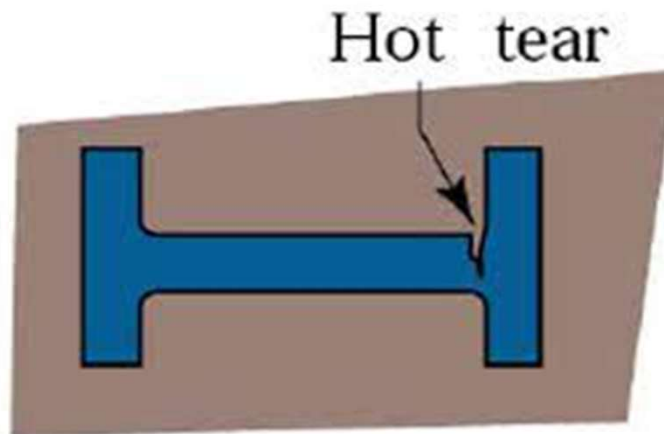
Mismatch

Mold shift is due to misalignment of upper (cope) and lower (drag) part of the mold. Mold shift is usually reflected as a horizontal displacement.



Hot Tears

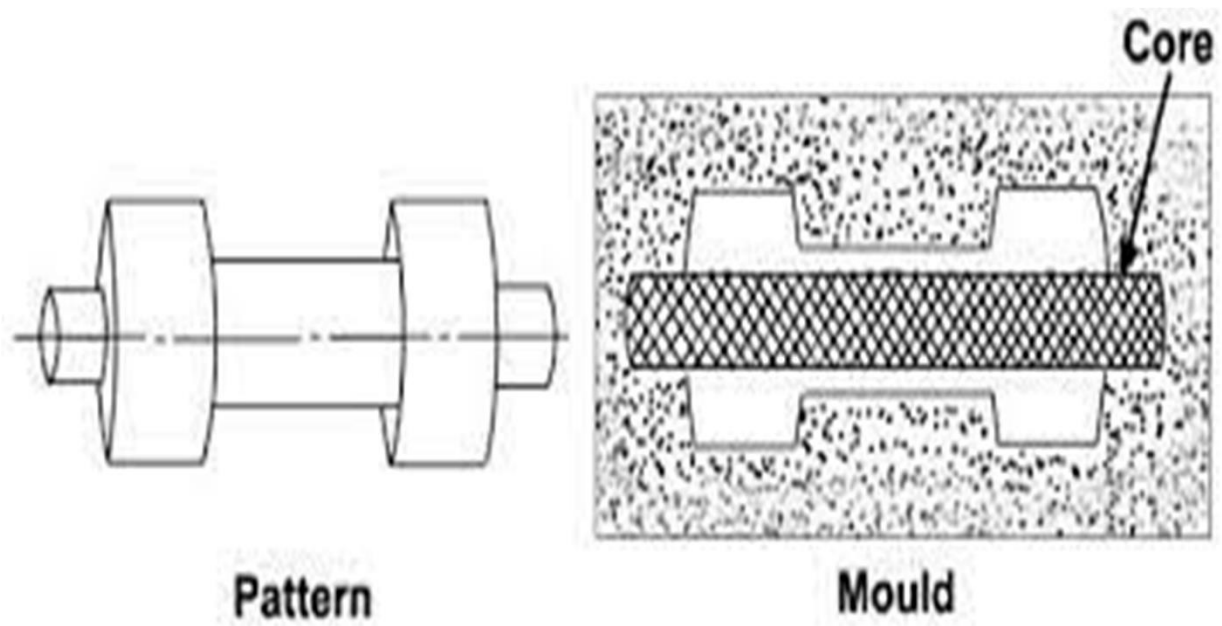
in this casting defects narrow cracks will take place in the pattern. These cracks are seen after the casting cools, when it's about to solidify. Hot tear occurs if the casted metal does not have sufficient strength to resist tensile forces during solidification and it is mostly caused by poor mold design.



Cores

To obtain the desired cavities and recesses, which otherwise could not be obtained by normal moulding operation.

- Full-scale model of interior surfaces of part
- It is inserted into the mold cavity prior to pouring
- The molten metal flows and solidifies between mold cavity and core to form the casting's external and internal surfaces



Conti..

May require supports to hold it in position in the mold cavity during pouring, called chaplets.

Core held in place in the mold cavity by chaplets with internal cavity.

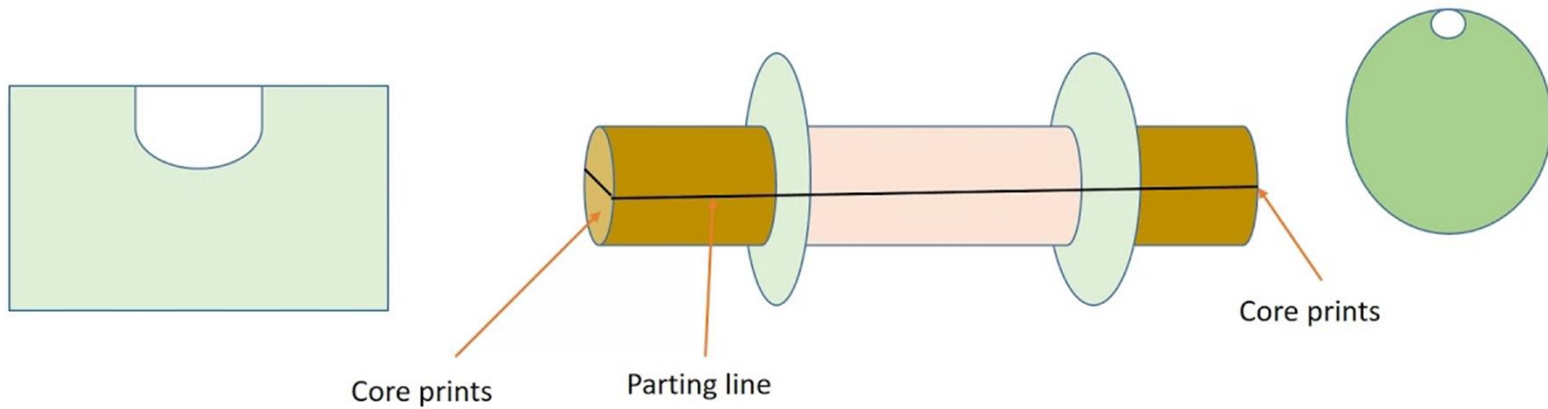
core print

The part of a foundry pattern which makes an opening in a mold to receive a core and to support it while the metal is being poured.

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chaplet

