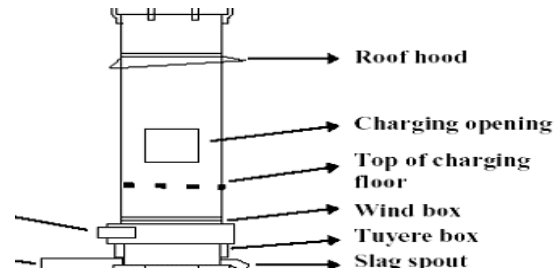


Furnaces

Cupola Furnace

- A continuous flow of iron emerges from the bottom of the furnace.
- Depending on the size of the furnace, the flow rate can be as high as 100 tonnes per hour.

At the metal melts it is refined to some extent, which removes contaminants. This makes this process more suitable than electric furnaces for dirty charges.



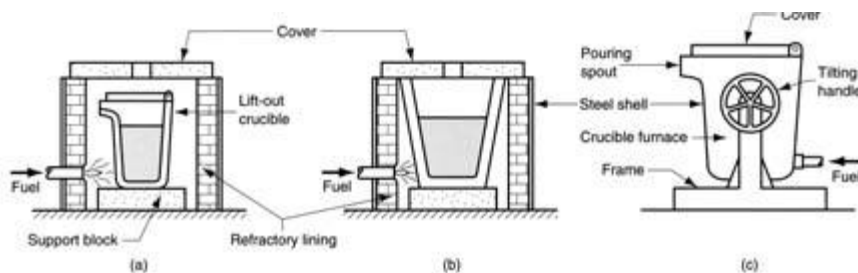
Direct Fuel-fired furnace

–Crucible Furnace

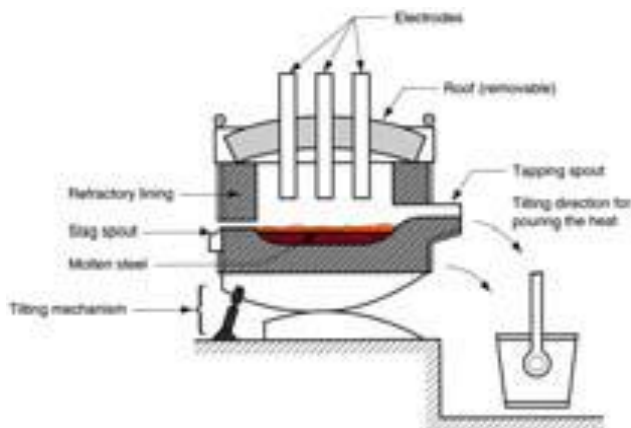
– Electric-arc Furnace

– Induction Furnace

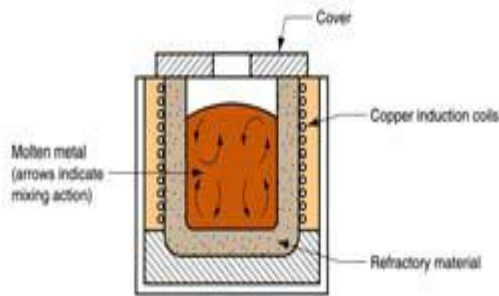
- Pouring with ladle
- Solidification – watch for oxidation
- Trimming, surface cleaning, repair and heat treat, inspection



Three types: (a) lift-out crucible, (b) stationary pot, from which molten metal must be ladled, and (c) tilting-pot furnace



Induction Furnace:



Casting defects

Defects may occur due to one or more of the following reasons:

- Fault in design of casting pattern
- Fault in design on mold and core
- Fault in design of gating system and riser
- Improper choice of moulding sand
- Improper metal composition
- Inadequate melting temperature and rate of pouring

Some common defects in castings:

a) Misruns b) Cold Shut c) Cold Shot d) Shrinkage Cavity e) Microporosity f) Hot Tearing
Misruns:

a) Misruns

It is a casting that has solidified before completely filling the mold cavity.

Typical causes include

- 1) Fluidity of the molten metal is insufficient,
- 2) Pouring Temperature is too low,
- 3) Pouring is done too slowly and/or
- 4) Cross section of the mold cavity is too thin.

b) Cold Shut

A cold shut occurs when two portion of the metal flow together, but there is lack of fusion between them due to premature freezing, Its causes are similar to those of a Misruns.

c) Cold Shots

When splattering occurs during pouring, solid globules of the metal are formed that become entrapped in the casting. Poring procedures and gating system designs that avoid splattering can prevent these defects.

d) Shrinkage Cavity

This defects is a depression in the surface or an internal void in the casting caused by solidification shrinkage that restricts the amount of the molten metal available in the last region to freeze.

e) Microporosity

This refers to a network of a small voids distributed throughout the casting caused by localized solidification shrinkage of the final molten metal in the dendritic structure.

f) Hot Tearing

This defect, also called hot cracking, occurs when the casting is restrained or early stages of cooling after solidification.