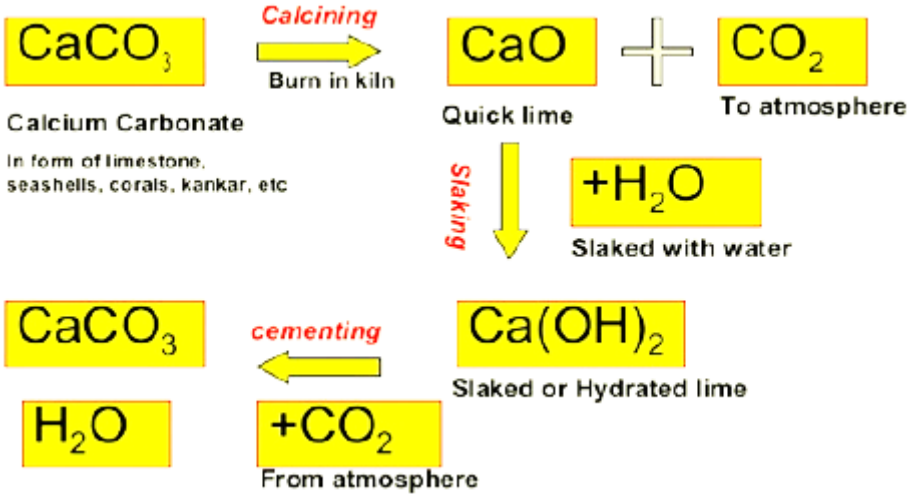
1.4 Lime – Preparation of lime mortar

Lime mortar is made by mixing lime, sand and water. Lime used for mortar may be fat lime (quick or hydrated lime) or hydraulic lime. Fat lime has high calcium oxide content. Its hardening depends on loss of water and absorption of carbon dioxide from the atmosphere and possible recrystallization in due course. Hydraulic lime contains silica, alumina and iron oxide in small quantities. When mixed with water it forms putty or mortar having the property of setting and hardening under water. Slaked fat lime is used to prepare mortar for plastering, while hydraulic lime is used for masonry construction and are most suitable for construction of chimneys and lightly loaded superstructure of buildings.



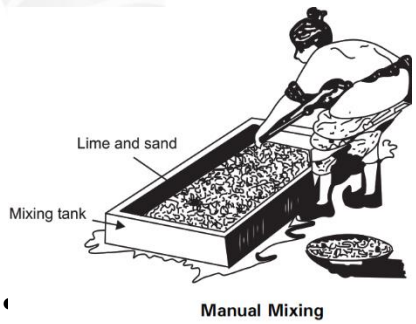
Preparation of lime mortar

- **Pounding-small quantities**
- **Grinding –large quantities of mortar**
  1. **Bullock driven grinding mill**
  2. **Power driven grinding mill**

Manual mix:

Pounding:

- Pit are formed on ground with lining of brick or stone at their sides and bottom.
- Pit are about 1.8m long,40 cm wide at bottom,50cmwid at top and 50cm deep.
- Lime and sand are mixed in dry state and placed in pit
- Small quantity of water added
- 4 or 5 person used to mix the mortar
- Heavy wooden pounder used to mix the mortar
- Required amount of water added frequently

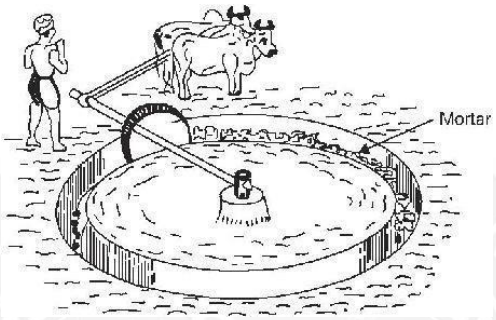


Manual Mixing

Grinding:

1. Bullock driven grinding mill:

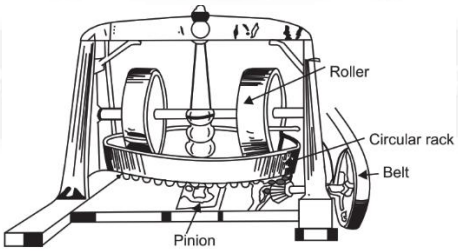
- A circular trench of dia about 6 to 9m and depth 40 mm is prepared
- Width 300mm
- A horizontal wooden shaft possess through stone wheel
- One end of shaft is attached to pivot and other end the bullock
- Lime and sand are placed in trench and required quantity of water added
- Bullock is turn around the mill.



Bullock Driven Mortar Mill

2.Power driven grinding mill:

- Power is required to mix the mortar
- It contains revolving pan of dia 1.8 to 2.4 m
- 2 rollers are provided with in pan
- Pan are revolved with help of oil engine, steam engine or electric power
- Lime, sand and required amount of water added pan are revolved
- This method gives better quality



Power Driven Mortor Mill (Pan Mill)

Use of Lime Mortar

Lime mortar is a building material consisting of lime, sand and water. It can be used for repairing old buildings and for restoration. In the lime mortar, lime and sand are mixed together in the proportion of 1:3. Setting of lime mortar occurs by the process of carbonation.

Lime mortar is mostly preferred over straight concrete because of its better properties. The quality of lime mortar help structures withstands the weathering effect and better controls ageing. An ordinary concrete mortar used between the brickwork or stonework may cause a cracking effect.

Lime Mortar Advantages and Disadvantages

As we know, lime mortar is a mixture of lime, sand and water. It is used in construction due to its advantages and disadvantages. Here some points related to the advantages and disadvantages of lime mortar are mentioned below.

Advantages of Lime Mortar

- Lime mortar has good workability and water retention properties.
- It can reduce the potential for water percolation.
- It tends to reduce normal movement like thermal expansion etc.
- It can reduce the frost action.

Disadvantages of Lime Mortar

- Lime mortar sets rapidly. So reducing the user's time for gauging.
- It may contain some soluble salts that can cause salt damage to brickwork or stonework.
- Segregation of cement can occur after the drying of works.

Precautions: Lime mortar or putty should be kept moist till use and in no case its drying is allowed. The mortar made of hydraulic lime should be consumed within one day and that with fat lime within 2-3 days.

Classification of lime mortar

1.Non hydraulic lime mortar

2. hydraulic lime mortar

3.Black mortar

1.Non hydraulic lime mortar:

- Set by carbonation so exposed to co_2 of air
- Proportion of lime and sand are 1:2,1:3
- Light in color, do not cause efflorescence
- Unsuitable for damp situation, foundation , thick wall
- Its setting action depends upon co_2
- Only used for thin joint in brick work

2. hydraulic lime mortar:

- Set by hydration
- These mortar are made from class A &class B
- Ratio of mortar 1:2
- Used for heavy engineering works

3.Black mortar

- So called because of their colour
- Lime mortar in 1:3
- They become hard after setting