

BRICKS

Sand - Lime bricks

Raw materials:

The raw materials required for manufacture of sand - lime bricks are as follow:

1-Sand

The sand used in sand - lime brick should meet the following physical and chemical properties:

- a. Contain not less than 70% silica.
- b. Well graded between 0.005 - 0.5 mm.
- c. Free from impurities such as organic matter, rock, minerals and soluble salts.
- d. The percentage of clay not more than 10%
- e. Iron compounds not more than 1.5%.
- f. Gypsum content not more than 1%.
- g. (CaO + MgO) not more than 5%.

2-Lime:

The lime used in sand lime brick should meet the requirements of Iraqi standard No. 572:

- a. Activity of lime shall not be less than 83%.
- b. The percentage of lime retaining on 75 μm sieves should not be greater than 2%.

3-Water:

Water used in sand lime brick should be fit for drinking.

4-Pigment:

To make colored sand lime bricks, suitable coloring pigment should be added in the mixture of sand and lime. The quantity of pigment varies from 0.2 to 3% of the total weight of the brick.

Manufacture:

- 1) Sand, lime and pigment are taken in suitable proportions and they are thoroughly mixed with a required quantity of water.
- 2) The material is then molded in the shape of the bricks under mechanical pressure (150-200 kg/cm^2).

3) Bricks are then placed in closed chamber and subjected to saturated steam pressure of about (8.5-16 kg/cm²) for (6-12) hours to speed up the interaction between lime and sand.

The process is known as autoclaving.

$\text{CaO} + \text{H}_2\text{O} + \text{SiO}_2 \longrightarrow \text{CaO} \cdot \text{SiO}_2 \cdot \text{H}_2\text{O}$ "Tobermorite" "Hydrous calcium silicate"

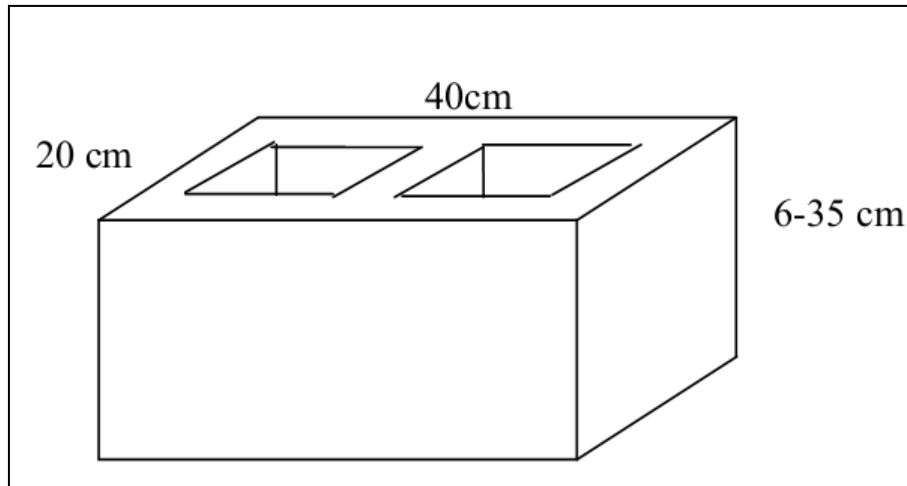
$\text{Ca}(\text{OH})_2 + \text{CO}_2 \longrightarrow \text{CaCO}_3 + \text{H}_2\text{O}$

Properties of lime sand brick:

- 1) The raw materials of these bricks do not contain any soluble salt. Hence the trouble of effloresces does not arise.
- 2) If plaster is to be provided on sand lime bricks, the quantity of mortar required will be less as bricks are uniform in size and shape.
- 3) These bricks are hard and strong.
- 4) These bricks are uniform in color and texture.
- 5) Sand lime bricks are used for ornamental work.
- 6) Possess adequate compressive strength about (15 MPa).
- 7) uniform in shape with true right angled corners, without cracks and smooth in finish.
- 8) They are lighter in weight than ordinary clay bricks.
- 9) Good durability.

Concrete blocks:

These blocks are manufactured from a mixture of Portland cement and aggregate for use in block masonry. Typical aggregate include sand, gravel, crushed stone and blast furnace slag. Mix proportion varies from 1:2:4 to 1:8:16 according to the required bearing capacity. These blocks are often made hollow for economical purposes and to reduce the weight of the block. The dimensions of the block are as follow:



And usually (20*20*40 cm).

Uses:

Concrete blocks are widely used for construction purposes especially in areas where soils are not suitable for manufacture of clay blocks and may be used in the construction of blocks panels for light weight structures and multistory formed structures.

Properties of concrete blocks:

- 1) The using of these blocks save time.
- 2) These blocks give good bonding with plastering materials used in their construction.
- 3) These blocks have accurate size and shape.
- 4) These blocks can produced with various bearing capacity according to the cement content used in their production.
- 5) The weight of blocks can be controlled by varying the size of openings.