

1) Percentage of water in plaster:

The water-plaster ratio is greatly affecting the strength of plaster. The higher the water plaster ratio, the greater are the plasticity and flow ability of plaster, but when it exceeds the optimum value, part of water remains between paste particles and tends to pull the particles apart, reducing the cohesion between them and between the plaster and building units and leading to a reduced strength and durability.

2) Condition of setting:

The strength of plaster drops to a large degree when the plaster remains wet for a long period exceeding 3-days after setting. The reason is due to decomposition of some of plaster crystals in water, leading to reduced chemical adhesion.

Gypsum products:

1- Plaster of Paris:

Produced by calcinations of a pure gypsum, no foreign materials being added either during or after calcinations.

Uses:

- 1) It is used as a wall plaster in finish coat.
- 2) It is used as a mortar for masonry construction.
- 3) It is used for casting ornamental work.

2- Ordinary plaster:

It is a hemi hydrate product ($\text{CaSO}_4 \cdot \frac{1}{2} \text{H}_2\text{O}$), produced by the calcinations of a gypsum containing certain natural impurities or by the addition to a calcined pure gypsum of certain materials which serve to retard the set or render the product more plastic.

Uses:

- a. It is used as a wall plaster in first coat.
- b. It is used as a mortar for masonry construction.

Chemical requirements in accordance with Iraqi standard No.28/1988:

1. The percentage of SO₃ not less than 35%.
2. The percentage of CaO not less ($2\frac{1}{3}$ SO₃)
3. The sum of soluble salts expressed as (Na₂O+MgO) not more than 0.25% by weight of plaster.
4. The percentage of chemically combined water not more than 9%.
5. The percentage of loss of ignition not more than 9%

Physical requirements in accordance with Iraqi standard No. 28/1988:

1. Fineness: The percentage retained on 1.18mm sieve not more than 8%.
2. Setting time should be between (8-25) minutes.
3. Compressive strength: Not less than 3MPa for standard cube 50*50*50mm.

3- Technical plaster:

It is produced by mixing two types of plaster: Hemi hydrate product (CaSO₄. $\frac{1}{2}$ H₂O) and anhydrous product (CaSO₄) with 50% for each.

Uses:

- 1) It is used as a wall plaster in first coat, and all finishing coat.
- 2) It is used as a mortar for masonry construction.

Chemical requirements in accordance with Iraqi standard No. 28/1988:

1. The percentage of SO₃ not less than 40%.
2. The percentage of CaO not less than ($2\frac{1}{3}$ SO₃)
3. The sum of soluble salts expressed as (Na₂O+MgO) not more than 0.25% by weight of plaster.
4. The percentage of chemically combined water not more than 9%.
5. The percentage of loss of ignition not more than 9%