Cons Mat Auto.
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MORTAR

Mortar may be defined as a paste formed by mixing binding material, fine aggregate and water in specific proportions. This paste hardens on drying and binds the bricks, stones or concrete blocks together.

Shamsi Photo Copy
Girls Café (U.E.T)

USES OF MORTAR

i) It is used in masonry to bind stones, bricks or concrete blocks together.

ii) It provides an even bed to stones, bricks or concrete blocks and prevents their inequalities from bearing upon one another.

iii) It is used for pointing the joints of masonry or for plastering the surface of masonry to protect it from weather and to give the work a pleasing and smooth finish.

iv) In concrete it is used to bind the particles of coarse aggregate into one solid mass.

TYPES OF MORTAR

Different mortars that may be used are: (i) Lime mortars, (ii) Cement mortar, and (iii) Lime cement or Composite mortars.

LIME MORTARS

Lime mortar may be (I) lime and sand mortar or (II) lime and surkhi mortar or (III) lime, sand and surkhi mortar or (IV) lime and cinder mortar (black mortar). → should be used within 24hrs of grinding.

Slaked fat lime is used to prepare mortar for plastering and hydraulic lime is used to prepare mortar for masonry construction. should be used within 4 hrs

LIME CEMENT MORTAR (Used within 2 hrs after adding cement)

It is also known as composite mortar. When lime mortar made from fat lime is desired to be improved with regard to its initial setting time then cement is added to it. Cement should be added only to that much lime mortar which can be used within two hours of the addition of cement *

CEMENT MORTAR (Used within 1.5hr 90 mins after adding water)

It is far stronger than lime mortar and is, therefore, preferred for use in the construction of structures subjected to heavier loads. When small quantities of it are required then it is

prepared manually. In case the requirements are large then it is mixed mechanically in the mixers.

PRECAUTIONS IN THE USE OF MORTARS

Following precautions in the use of mortars should be considered.

1- All mortars prepared for masonry works shall be used as soon as possible with the maximum limits given below:

a) If hydraulic lime (Class A lime) is present in mortar as an ingredient, the mortar shall be used within four hours.

b) Lime mortar made with surkhi or cinder shall be used within 24 hours of grinding.

c) Composite mortars shall be used within two hours of the addition of cement.

d) Cement mortar shall be used within 90 minutes after adding water.

2- All lime mortars, after grinding shall be kept wet and shall never be allowed to dry. This may be done by covering ground mortar with wet sacks.

3- Partly set and dried mortar should not be retempered and used.

4- All masonry using lime mortar shall be cured for a period of six days. Whereas cement mortar is kept wet for little longer periods.

5- In case of masonry works with lime mortars, it is desirable that masonry, after a height of every 1.5 metre, shall be allowed to set for about two days before starting further construction over it.

6- Hydraulic limes and cements set and become hard in the presence of water. Bricks which are porous absorb greater part of water from the mortar (thus the mortar becomes weak). Bricks should be fully saturated with water before laying them in the structure.

FIRE RESISTANT MORTAR

Commonly used lime and cement mortar are unsuitable for ~~setting refractory bricks or blocks used for the lining~~ in of furnaces where the temperatures are too high for these mortars. At such high temperatures these mortars fail due to shrinkage and cracking.

So special fire resistant mortars are used along with refractory bricks or blocks which can sustain high temperature.

GROUT

It is a cement mortar of fluid consistency. For repairs of cracks or fissures, it is injected under pressure into the cracks. It also may be injected in the soil so as to increase its bearing capacity (it is known as soil stabilization). Empty joints in masonry, left due to bad workmanship are filled up by grouting. To fill up bigger cracks, a little coarse aggregate may also be added to it.

PLASTERING

Masonry and concrete surfaces have often to be plastered to give protection to the masonry & concrete surfaces and to improve appearance. The surface to be plastered should be clean, free from dust, loose material and greasy spots. If required, the surface should be washed and brushed. To provide a key to the plaster all joints in the masonry should be raked out to a depth of about 1.25 cm when the mortar is still not set. In case the surface is to be plastered with cement mortar or lime mortar, the surface should be wetted for a few hours. Excessive wetting should be avoided as the plastering does not stick well to such surface.

Plaster may be applied in one or more coats but the thickness of a single coat should not exceed 1.25 cm. In case more than one coat of plaster are being applied then no coat should be applied before the previous one has attained full setting and shrinkage. Scratches should be made on the coat of plaster (over which another coat is to come) when it is still green. This is done so as to provide key to the next coat of plaster. Fine sand used in cement plaster gives as good finish but if the sand is too fine then the plaster shall have shrinkage cracks.

Cement plaster should preferably be gauged with fat lime which would reduce shrinkage cracks and improve workability but it would make the setting of plaster slow. Use of very fine sand would further slow down the setting of plaster.

Freshly applied plaster should be protected from excessive winds, direct sun or frost. It should be cured for no. of days.

POINTING

It is the filling up of masonry joints, raked out to a depth of at least 1.25 cm, with the same mortar as used in masonry or a different one. It is done primarily to seal off the cavities left in the mortar joint thereby stopping the entry of moisture inside the wall. Also the purpose of pointing the masonry is to improve the appearance of the surface.

Sometimes the masonry surface is not desired to be plastered due to many reasons and is simply pointed. Cement mortar, lime mortar or lime mortar gauged with cement may be used for pointing.

USE OF CEMENT SAND MORTAR

Various Proportions		
(1:2) c/s Mortar	1	For vertical DPC, For pointing etc,
(1:3) c/s Mortar :	1	For brick work of 3" thick. Plastering on walls in bathrooms and kitchens as base for tiles or marble.
	2	For plastering the soffits of beams & slabs.
	3	For skirting upto 4" height,
	4	For Stone masonry.
(1:4) c/s Mortar :	1	For brick work of 4 ½ " thick. For Stone masonry
	2	For bricks work in foundation where the area is water logged.
	3	For external plastering of the walls and other Brick works.
(1:5) c/s Mortar :	1	For brick work in foundations.
	2	For internal plastering of brick works etc.
(1:6) c/s Mortar :	1	For brickwork in super structure having thickness > 9"

1:7 c/s Mortar higher, lean mortar, for temporary work.