

Quick Drying of Cement

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Abstract: Cement is a special blend of fast-setting cements, sand and gravel designed to set hard in approx. 20 to 40 minutes. Quick drying cement is useful for a number of jobs, including setting posts in the ground for fencing or for repairing cracks and holes in exterior walls. Several research projects have been carried out to investigate the moisture control process at the jobsite and the effect of moisture on cement while construction. The main goals of these projects have been how to avoid moisture problems during the building process on a jobsite, how to evaluate beforehand the drying time of cement and how to measure the moisture of structures. In the different countries, the moisture control of structures is done by using the relative humidity (RH) method. Fast drying cement has been used for the floors of buildings and on different construction sites in Portland. By using high quality cement the risk of mould growth can be decreased not only during the building process but also during the occupancy of the building. The fast strength development of rapid drying cement can also be utilized especially during the winter in cast on site frames.

Keywords: Cement, water content, concrete

I. INTRODUCTION

The term cement is commonly used to refer to powdered materials which develop strong adhesive qualities when combined with water. These materials are more properly known as hydraulic cements. Gypsum plaster, common lime, hydraulic lime and Portland cements are the more common hydraulic cements, with Portland cement being the most important in construction. Cement was first invented by the Egyptians. Cement was later reinvented by the Greeks and the Babylonians who made their mortar out of lime. Later, the Romans produced cement from pozzolana, an ash found in all of the volcanic areas of Italy, by mixing the ash with lime. Cement is a fine greyish powder which, when mixed with water, forms a thick paste. When this paste is mixed with sand and gravel and allowed to dry it is called concrete. About ninety-nine percent of all cement used today is Portland cement. The name Portland cement is not a brand name. This name was given to the cement by Joseph Aspdin of Leeds, England who obtained a patent for his product in 1824. The concrete made from the cement resembled the colour of the natural limestone. The balance of cement used today consists of masonry cement, which is fifty percent Portland cement and fifty percent ground lime rock. There are two types of raw materials which are combined to make cement:

- Lime-containing materials, such as limestone, marble, oyster shells, marl, chalk, etc.
- Clay and clay-like materials, such as shale, slag from blast furnaces, bauxite, iron ore, silica, sand, etc.

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II. SOME ADVANTAGES OF QUICK DRYING OF CEMENT

- It is used where formwork has to be removed as early as possible in order to reuse it.
- It is used where high early strength is required.
- It is generally used for constructing road pavements, where it is important to open the road to traffic quickly.
- It is used in industries which manufacture concrete products like slabs, posts, electric poles, block fence, etc. because moulds can be released quickly.
- It is used for cold weather concreting because rapid evolution of heat during hydration protects the concrete against freezing.



III. EXPERIMENT

Step 1

Mixing quick drying cement will depend on the type and size of job you are doing. For example, when securing posts in post holes you can pour water into the hole and then add the cement and mix it in place. If you have small jobs, such as filling cracks in exterior walls then you can simply mix up a small amount in a bucket and then apply it to the cracks.



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For larger jobs, such as cementing in drainage pipes, then mix up a larger quantity on a mixing board or use a wheelbarrow.

Step 2

Before you start mixing your cement you should wear the appropriate safety equipment. You should always wear protective eye wear and a face mask. The dust from the cement is extremely harmful to the respiratory system and can be very irritable and harmful to your skin. Make sure you are wearing eye goggles and a face mask. If you do get any cement powder on you, then wash this off immediately with cold water. If you do happen to get cement dust on you and you suffer a severe allergic reaction then seek medical attention.



Step 3

You will find that the manufacturers of each type of quick drying cement will give slight variations on mixing recommendations. Generally it is best to mix quick drying cement to 5 Parts Cement to 1 Part Water but you may find the recommendation is 3 Parts Cement to 1 Part Water. Always read the manufacturers mixing instructions, which will be printed on the packaging along with safety recommendations. Mix the cement until all the cement powder is mixed with the water and the mixture is pliable.



Step 4

Mix the cement until all the cement powder is mixed with the water and the mixture is pliable and a very dark gray in colour. When the mixture is ready you will need to work

fast as the cement mix will start to set within 10 minutes. Before applying the cement make sure the area you are working on is slightly damp. You DO NOT want the area soaking wet, just slightly damp. You can now apply the cement with a trowel or flat putty knife – depending on the job you are doing. If you are working on a large area then a builders trowel will work well. If on the other hand you are filling cracks in a wall then a flat putty knife would work well.



Step 5

In Step 4 we mentioned that quick drying cement generally sets within 10 minutes or so. You need to make sure that you can smooth the area, or level it, within 5 to 7 minutes before it really starts to set. While this is the case you will find this is only the surface. When the cement is fully cured it will turn a very light dusty gray and will be completely solid.



Step 6

When you have finished make sure you wash your tools and equipment thoroughly. If you have any quick drying cement powder left over you can store this for later use. Read the storage instructions on the packaging. You will need to make sure that you store the cement in a cool and dry place. Make sure that if you have children that they cannot get access to it. Again cement powder is extremely harmful to the eyes and respiratory system so be careful to that.

Precautions:

- Mix only as much material as can be placed in 20 minutes.
- Because of the rapid setting time, special precautions must be taken, as set times will fluctuate in extremely hot or cold weather. Use cold water or water mixed with ice cubes in severely hot weather. Use hot water when mixing in severely cold weather. The ideal circumstances for curing are ample moisture and moderate temperature and wind condition.



Specific Method for: Fast-Setting Concrete is often used a few hours after placement, initial curing is very important. The most convenient curing method is to cover the concrete with plastic

IV. RESULTS

The quick drying cement is very useful as it requires least time to set. This cement does not require formwork of it for ample time. Suitable under any climate. Do not need expert laborers while handling with the cement.

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