

**TOWARDS EFFECTIVE SELF-CURING AGENT FOR DECIDING
OPTIMAL DOSAGE FOR VARIOUS CONDITIONS****Naresh Kumar Patnam¹, Sanjeeva Rao C², Raja Vardhan Reddy Boddu³**¹M.Tech Student, Dept of SE, Avn Institute of Technology, Hyderabad, T.S, India²Professor, Dept of Civil Engg, Guru Nanak Institute of Technology, Hyderabad, T.S, India³Assistant Professor, Dept of Civil Engg, Guru Nanak Institute of Technology, Hyderabad, T.S, India**ABSTRACT:**

Curing of concrete will play an important role in making of concrete microstructure as well as pore arrangement and thus improves its stability as well as performance. It is the process of controlling of rate as well as amount of moisture that is transported from concrete during the hydration process of cement. Self-curing concrete is a kind of modern concrete that will cure itself by means of preserving the water or else moisture content inside it. The main objective of our work is to make use of water soluble polymeric glycol as the agent of self-curing. Our objective is to take advantage of water soluble polymeric glycol, that is chosen from group that consists of polyethylene glycol as an agent of self-curing and to choose best possible dosage for various conditions of curing in arid atmospheric circumstances. Self-curing concrete is set up into concrete structures to decrease water usage quantity while curing and this concrete will generally need the agents of self-curing for decreasing of evaporation of water from concrete, and consequently will enhance the capacity of water retention of concrete when compared to traditional concrete material.

Keywords: Self-curing concrete, Water retention, Moisture, Cement, Polymeric glycol.

1. INTRODUCTION:

In the modern world any kind of structure is not possible without usage of concrete and the most important reason is due to its good quality compressive strength as well as durability. The process of curing is intended mainly to maintain the concrete moist, by means of prevention of moisture loss from concrete during time period where it is gaining potency [1]. Curing of concrete is continuing suitable moisture content in concrete throughout its early stages to develop satisfactory properties hence high-quality curing is not constantly realistic in lots of cases. The concrete will generally need 28 days curing for attaining of maximum strength. Lack of accurate curing will have a bad affect on the strength as well as durability. In structures similar to columns water in upper part of structure might evaporate simply when measures to bottom part then, the structure will need some additional water in support of appropriate curing. This might enhance amount of water usage and when accurate curing is not performed it might result into a malfunction to obtain satisfactory results. In the process of self-curing concrete, no labor work is necessary to offer water for concrete, or else even recognize any external

curing is necessary and after placing, properties of this concrete are comparable better than concrete with traditional curing. Self-curing concrete is set up into concrete structures to decrease water usage quantity while curing. The concrete will generally need the agents of self-curing. Some particular chemicals of water-soluble added throughout mixing process will reduce evaporation of water from as well as within set concrete, building it self-curing [2][3]. The agents of self-curing are utilized to decrease evaporation of water from concrete, and consequently will enhance the capacity of water retention of concrete when compared to traditional concrete material. The usage of admixtures of self-curing is extremely significant from the opinion that resources of water are getting expensive day by day. To attain appropriate curing, agents like poly ethylene glycol and wax and so on are utilized as the agent of self curing. The main intention of our work is to make use of water soluble polymeric glycol as the agent of self-curing. Our intention is to make use of water soluble polymeric glycol, that is chosen from group that consists of polyethylene glycol as an agent of self-curing and to choose best possible dosage

for various conditions of curing in arid atmospheric circumstances.

2. METHODOLOGY:

Curing may possibly be moreover after placing in position, thus maintaining time for cement hydration process to take place. The main intention of our work is to make use of water soluble polymeric glycol as the agent of self-curing. Self-curing concrete indicates that no labor work is necessary to offer water for concrete, or else even recognize any external curing is necessary and after placing, properties of this concrete are comparable better than concrete with traditional curing. Self-curing concrete will generally need the agents of self-curing and these will evaporate water from concrete, and for this reason improves capacity of water retention of concrete when compared to traditional concrete. The usage of admixtures of self-curing is extremely significant from the opinion that resources of water are getting expensive day by day. A self-curing concrete is offered for absorption of water from atmosphere to attain improved hydration of cement in concrete and solves problem that amount of cement hydration is made lesser because of improper curing, and as a result insufficient properties of

concrete. Some particular chemicals of water-soluble added throughout mixing process will reduce evaporation of water from as well as within set concrete, building it self-curing. The chemicals must contain abilities to decrease evaporation from solution and to get better water maintenance in normal Portland cement matrix. Several chemicals are hydrophilic in nature such as glycerine, polyvalent alcohol, polyethylene glycol, Polyxyelhylene and Phytosterols and so on. In self-curing, there is a continuous evaporation of moisture will occur from an exposed surface because of differentiation in potentials of chemical among different phases.

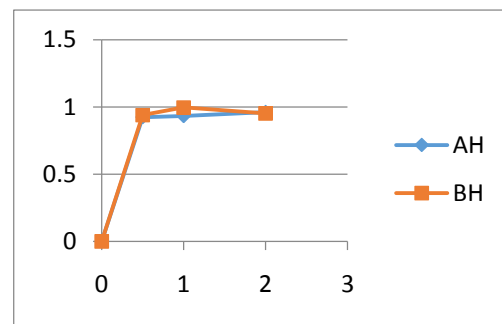


Fig1: an overview of compaction factor for various percentages of PEG 6000

3. AN OVERVIEW OF PROPOSED SYSTEM:

Various studies have explored option of accomplishing self-curing concrete and

hence the requirement to build up the agents of self-curing has gained attention in the recent times. Concrete incorporating agents of self-curing will signify a novel development in concrete building in the recent times [3][4]. The curing effect, mainly novel techniques such as self-curing on high performance properties concrete is of main importance to the latest industries of concrete. The main objective of our work is to make use of water soluble polymeric glycol as the agent of self-curing. In the process of self-curing, there is a continuous evaporation of moisture will occur from an exposed surface because of differentiation in potentials of chemical among vapour as well as liquid phases. The polymers that are added in mix generally form hydrogen bonds by water molecules and will decrease chemical ability of molecules which gradually decreases vapor pressure and this will decrease rate of evaporation from surface. Our intention is to make use of water soluble polymeric glycol, that is chosen from group that consists of polyethylene glycol as an agent of self-curing and to choose best possible dosage for various conditions of curing in arid atmospheric circumstances. Two mixes of concrete of ordinary portland cement are

generally considered for our work and polyethylene glycol was utilized as an agent of self-curing in concrete [5]. The concrete mix with as well as without the agents of self curing were subjected to various curing types such as conventional as well as indoor curing. We have to compare the usage of various coarse aggregate and to discover the best possible strength. Retention of water, compacting factor as well as compressive strength of concrete that contains self-curing agent was studied [6]. Concrete weight loss by means of time was performed to appraise the ability of water retention for various dosages of self-curing agent as well as for several conditions. The workability concerning concrete with low ration of w/c has important effect because of higher molecular weight polyethylene glycol (PEG6000). Water maintenance of concrete by means of low w/c ratio in combination has important effect because of adding up of superior molecular weight polyethylene glycol. Effectiveness of self-curing concrete is affected by means of percentage dosages of self-curing agent. Water retention concerning concrete mixes including agents of self-curing is advanced when compared to usual concrete mixes. The compressive strength concerning concrete by means of

lesser w/c ratio as well as with high dosage of polyethylene glycol is advantageous. The usage of superior molecular weight polyethylene glycol by means of high ration of w/c is not advantageous.

4. CONCLUSION:

Curing is the controlling process of rate as well as amount of moisture that is transported from concrete during the hydration process of cement. Self-curing concrete is introduced into concrete structures to decrease water usage quantity while curing. The concrete will usually need agents of self-curing and these agents of self-curing are utilized to decrease evaporation of water from concrete, and consequently will enhance the capacity of water retention of concrete when compared to traditional concrete material. Our work makes use of water soluble polymeric glycol as the agent of self-curing. A self-curing concrete is provided for absorption of water from atmosphere to attain improved hydration of cement in concrete and solves problem that amount of cement hydration is made lesser because of improper curing, and as a result insufficient properties of concrete. Our objective is to utilize water soluble polymeric glycol, that

is chosen from group that consists of polyethylene glycol as an agent of self-curing and to choose best possible dosage for various conditions of curing in arid atmospheric circumstances. In self-curing, there is a continuous evaporation of moisture will occur from an exposed surface because of differentiation in potentials of chemical among vapor as well as liquid phases. Efficiency of self-curing concrete is affected by means of percentage dosages of self-curing agent. Retention of water concerning concrete mixes including agents of self-curing is advanced when compared to usual concrete mixes.

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