iJRASET
International Journal For Research in Applied Science and Engineering Technology

INTERNATIONAL JOURNAL FOR RESEARCH

IN APPLIED SCIENCE & ENGINEERING TECHNOLOGY

Volume: 5 **Issue:** V **Month of publication:** May 2017

DOI:

www.ijraset.com

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Volume 5 Issue V, May 2017
ISSN: 2321-9653
International Journal for Research in Applied Science & Engineering Technology (IJRASET)

Impact of Accelerating Admixtures On 7 Days & 28 Days Cube Crushing Strength Of M-20 Mix of Concrete

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Abstract: ***In this paper study is done regarding early strength gain using different Admixtures in order to reduce the time period of project. Test are to be conducted on different high strength concrete specimen such as, chemical polymer , fly ash, NaoH , KOH , FRP, CaCl2 , and accelerator dosage . The basic aim of research is to reduce the curing period so that overall project cost and project period can be optimized. Keywords: Admixtures, accelerators, compressive strength.***

I. NTRODUCTION

In present scenario fast construction technology is required to meet the demand of low cost housing projects. For this purpose precast technology has been developed. In this method walls and slabs are casted at casting beds in factory and de-mould it after 24 hours of curing. For this purpose heavy equipments casting beds, curing equipment and factory sheds are required, the approximate cost of this setups are 20% of the project cost, which are huge amount. Efficiency of de-moulding / lifting from beds are the main factor to increase the efficiency of production. Generally OPC cement and steam curing is used to get the early age strength, but the object gets 60% strength after 24 hr curing..

II. REVIEW OF LITERATURE.

Precast concrete is advantageous for several reasons: shrinkage and creep can be reduced, dead-load deflections can be controlled, quality control is improved, material availability can be improved and erection methods are similar to that for steel and thus total construction time is significantly reduced. Typical physical processes used to accelerate the curing process are generally combinations of the following: increases in curing temperature, introduction of moisture to curing environment. While fly ash is frequently used in order to improve other properties of concrete, it has a retarding effect on the initial set and early strength gain of concrete, and should not be used for accelerated curing purposes. Although a number of methods currently exist for the acceleration of the curing process, most precast manufacturers maintain relatively simple operations, and due to logistical and economic constraints, only employ one or two of the methods described herein. Despite recent advances in the use of admixtures, the primary method of accelerated curing in the precast industry today still seems to be the use of elevated curing temperatures, which are achieved through various means.. The hydration characteristics were tested via the determination of the combined water content, phase composition, compressive strength, total porosity (P %) and X-ray diffraction analysis (XRD) at different time intervals up to 180 days. (viii) Bonavetti , et. al., (2000) This paper describes the effect of duration of initial curing on the mechanical properties (compressive strength, tensile strength, and modulus of elasticity) and the chloride penetration of concretes containing limestone blended cements.The time-honored approach to ensure quality of concrete is to take samples at the job site, to mould test cylinders, and then to cure the cylinders under standard conditions for 28 days before testing. The higher temperature requires special equipment, make the specimens difficult to handle, and introduce special problems when air-entraining agents and other additives are used.Results from work previously published appeared somewhat contradictory, but it now seems that strength is increased and shrinkage decreased if specimens undergo a period of curing in carbon dioxide immediately after de-molding. The original regression equation reported by the Mines Branch relating the compressive strength of accelerated-cured cylinders to that of 28-day standard-cured cylinders has been compared with the equation developed at the University of Calgary, and the two regression lines are about identical. Each testing and control authority contemplating the use of the modified boiling method is urged to develop its own correlations for predicting 28-day compressive strengths and not to rely on the correlations published by others. Additional acceleration of concrete hardening, depending on qualities of cements and concretes used and on degree of acceleration required for various methods, is achieved in the following ways' /1/ mechanically by positive agitation with mixture, efficient compaction of

concrete mixtures by loaded, repeated and multi-frequency vibration, by vibratory pressing or rolling of the products, etc., /2/ chemically, by addition of chemical admixtures accelerating hardening prehydration of cements, treatment with gases /silicon tetrafluoride, carbon dioxide/, and /3/ physically chiefly by heat treatment /low and high-pressure steam treatment, electrical curing, curing with hot gases, immersion in water and oil, etc./. Economic expediency of one or another method of heat treatment can be determined by' /1/ comparing design characteristics of several plants of equal capacity using low- and high-pressure steam treatment, electrical curing and natural curing of concrete products, and /2/ investigating economic indexes characterizing operation of existing precasting plants. Plants technical and economic studies reveal that very often fabrication technology assuring optimum qualities of concrete does not meet the requirements of economy and ease of production therefore, many seemingly advanced technological methods do not find practical application. The climate change issue and the discussion around the non-renewable energy resources triggered a change for better energy-utilizing systems. The present paperreviews the historical evolution of the MWs energy implementation to cure concrete. It further provides a deeper understanding of this technology and proposes suitable points for future study and development. Also curing criteria and the disadvantages of the conventional methods used to accelerate the rate of hydration reaction of concrete are summarized. The second part reports the implementing method for achieving this purpose covering dielectric properties involved and related heating mechanisms. Finally, some aspects for future studies are proposed to build a forward-complementing knowledge from the current one. (xv) Water Bath Accelerated Curing of Concrete, et. al., Water bath methods for accelerating the strength development of Portland cement concrete were investigated. The three methods studied consisted of: curing immediately after casting in 95 f water for 24 hours; curing in boiling water for 3-1/2 hours, commencing 23 hours after casting; and curing in boiling water for 15 hours commencing after the concrete reached a penetration resistance of 3500 psi (fixed set). Also studied were the effects on the results of the fixed set accelerated curing methods of curing water temperatures from 95f to 212f. The fixed set boiling method is the most efficient and reliable of those studied. Water bath accelerated curing is more efficient for high than for low strength concretes. Accelerated curing efficiencies are directly proportional to the total relative amounts of heat released by the concretes during accelerated curing. Optimum water bath temperatures for accelerated concrete strength development range approximately from 165 degrees to 180f. /author/

III. CONCLUSION

After reading the above research papers on “Impact of accelerating Admixture on strength of concrete” their is a problem of lifting a precast member only after 24 hrs which occupies the bed for 24 hrs, as the initial cost of project is very high. Lifting of precast member is done only after 24 hrs , this is very time taking and this particular problem should overcome. For these various admixtures can be use to gain the early age strength and various curing method should be applied to reduce the curing period.

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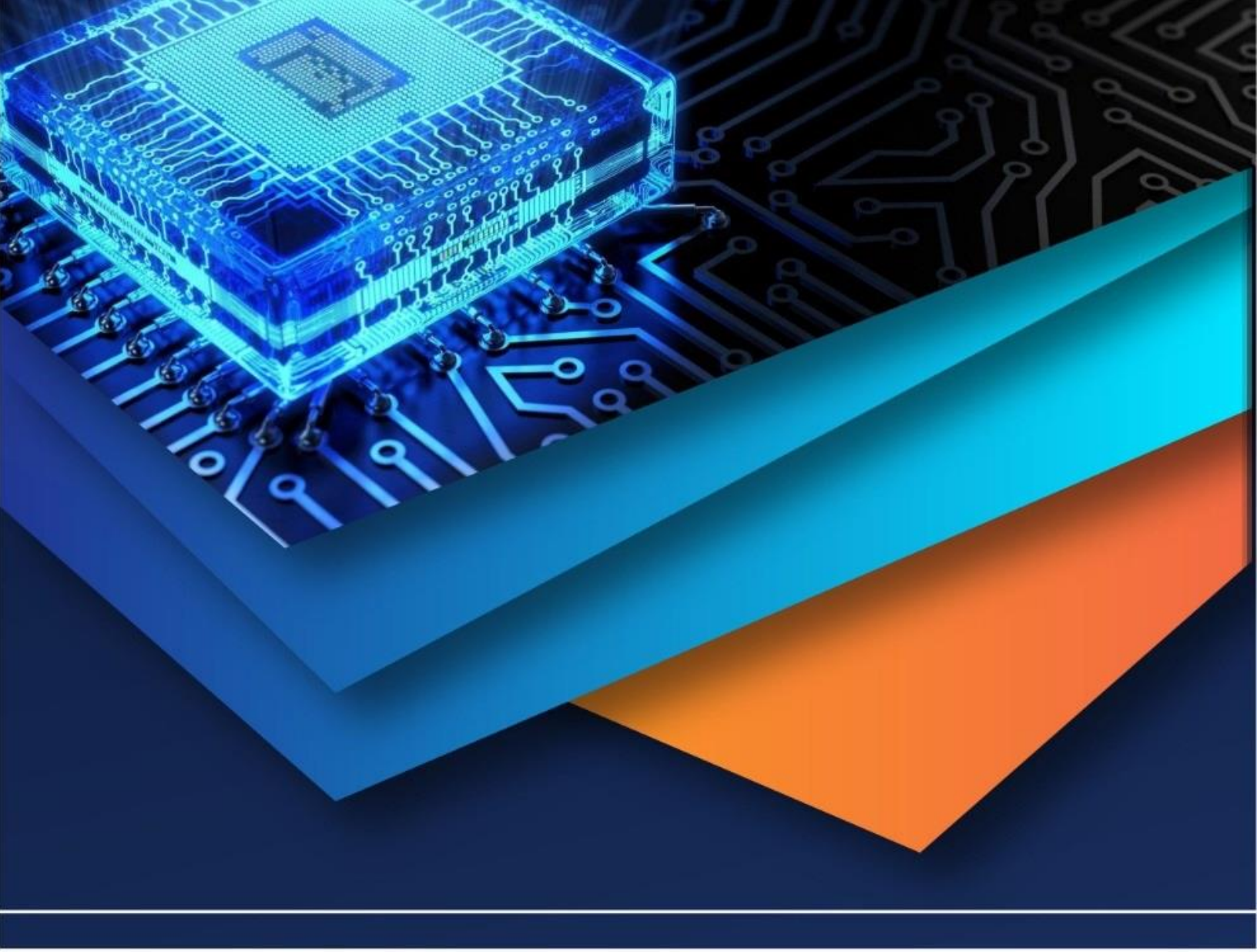

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