

# REVIEW ON DIFFERENT CURING METHODS

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## ABSTRACT

*This paper gives an overview of different techniques used for curing water in concrete. The purpose of this investigation was to conduct a laboratory test program on how much different curing conditions affect the attainable strength of concrete. In this paper variation compressive strength 4 different curing techniques is discussed. Initially several trials were carried out of mix design for M30. Slump test was carried out on concrete. To achieve this purpose, a laboratory test program was conducted. The laboratory program consisted of casting 150 mm by 150 mm concrete cubes using mix designs and subjecting them to four different curing conditions. This study considered the effect of different methods of curing on compressive strength of concrete. The cubes were cured using four methods (dripping method, 24 hr water, plastic sheet, sponge method) until testing ages of 3, 7, 14, and 28 days when their compressive strengths was determined. Sponge curing method gives more strength and also required less amount of water. Sponge curing method is more effective than other curing method.*

**Keyword:** - dripping method, 24 hr water, plastic sheet, sponge method, slump test, compressive strengths

## INTRODUCTION

Water is one of the basic needs of human civilization and also prime national resource and most precious assist. It is available in a highly irregular fashion. It is not available in places where we want it, at times when we want it and in quantities in which we want it. Hence the need for conservation .water is stored in dams, recharged in ground storages, rivers etc. And used throughout the year or till next monsoon will arrive.

Water is use for many purposes like domestic, industrial, agriculture, construction, fisheries etc. Water is one of the most important elements in construction. During construction work the water is required for preparation of mortar, mixing of cement concrete and for curing work etc. In construction large amount of water used for curing and also large amount of water waste. For reducing or conserving waste water number of technique implemented on site and some different techniques are used in this project.

Efficient water use makes good business sense. There are many opportunities for our construction site to make simple changes to daily operations which will save significant quantities of water. These

reductions will improve the efficiency of our construction, increase effectively our site profile, increase worker performance and save considerable amounts of money.

It is worth noting that construction as a whole is relatively efficient with its water use. Many construction sites have made considerable reductions in their water demands and benefits of their increased performance. We should use this good work and the forthcoming water restrictions as motivation to increase our performance even further.



**Fig -1: Curing Methods**

## **PROBLEM STATEMENT**

The major problem in implementing water conservation technique on site is illiterate, unskilled labours & also the attitude of labours towards work. Also due to lack of communication between supervisors & labors the implementing of water conservation methodology is becomes difficult. At construction site waste of water is more, due to negligence of managers, supervisors towards works, also transfer the responsibility to the subordinates and the excess water use for curing by labours.

All the work are depends upon labours. So, it affects the implementation of water conservation. Small construction site are not interested in implementing water conservation.

## **OBJECTIVE**

- To study the concept of water conservation technique & how is it being implied in practically.
- Reduce excess amount of water use on construction site.
- Apply various methods of curing.
- Reduce cost of project by using some technique

## **ADVANTAGES**

Following are the various advantages of using water conservation technique on site,

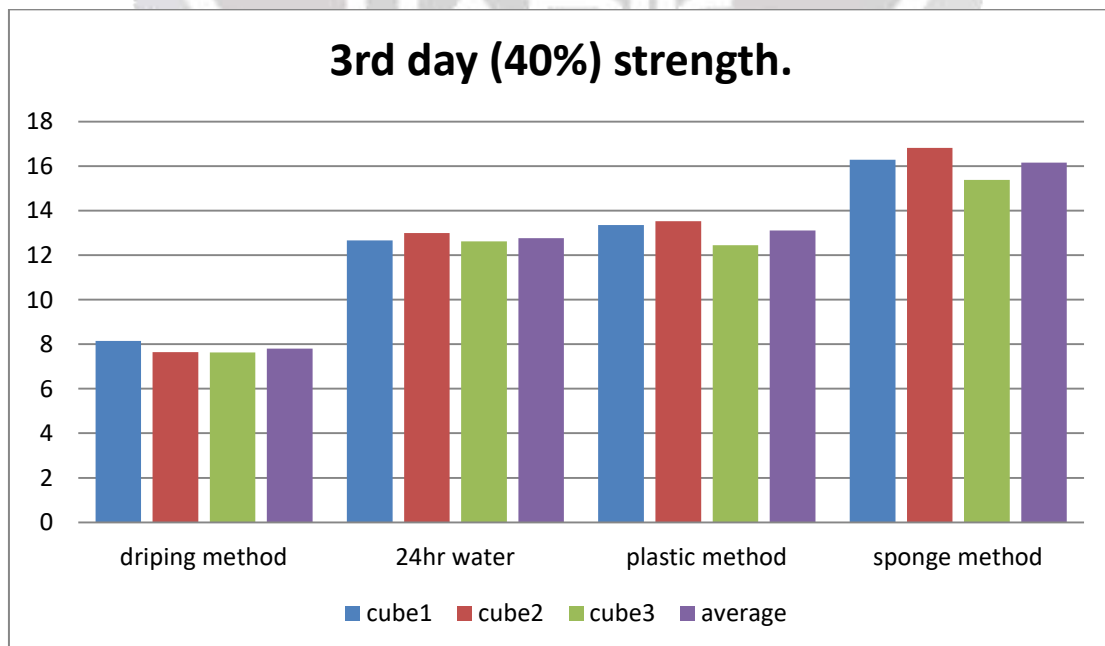
- Minimize waste of water
- Minimize the cost of water
- Provide immediate result
- Use of sponge give better result and increasing strength of concrete

**RESULTS**

Following are the result of curing method on the basis of strength. (Actual adopted in lab)

Sr. No.	Type of method.	strength (N/MM <sup>2</sup> )	Average (N/MM <sup>2</sup> )
1	Dripping Method	8.142	
		7.644	7.804
		7.626	
2	24 hr water	12.656	
		12.998	12.785
		12.62	
3	Plastic sheet	13.348	
		13.517	13.103
		12.444	
4	Sponge method	16.284	
		16.817	16.158
		15.374	

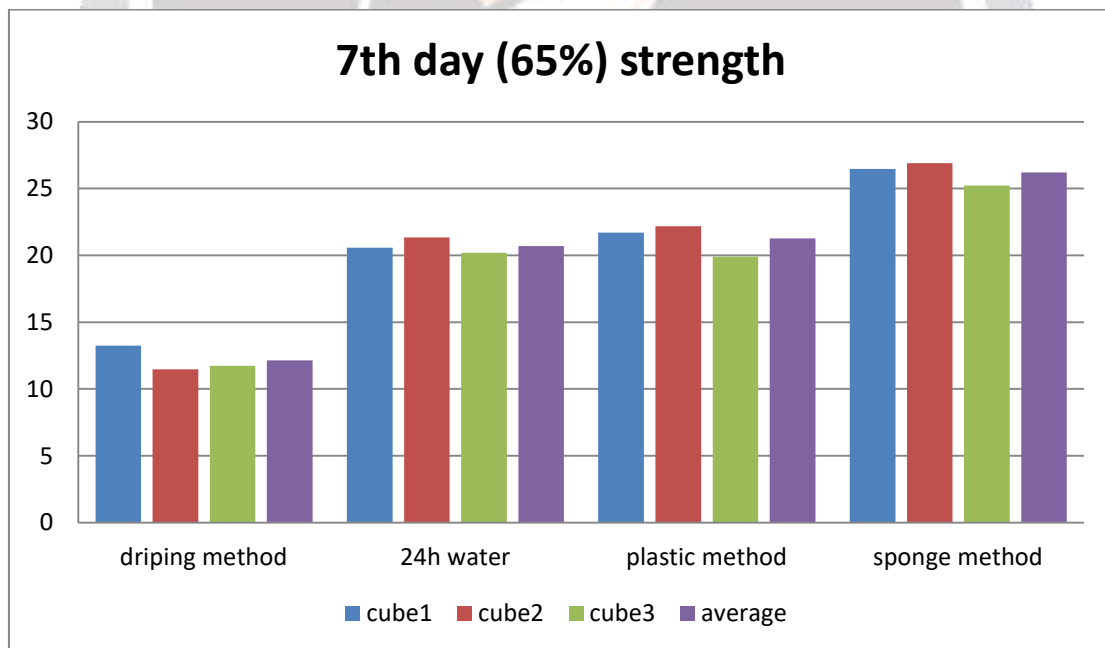
**Table -1:** Curing strength after 3 days. (40%)



**Chart -1:** Curing strength after 3 days. (40%)

Sr. No.	Type of method.	strength (N/MM <sup>2</sup> )	Average (N/MM <sup>2</sup> )
1	Dripping Method	13.231	12.143
		11.466	
		11.733	
2	24 hr water	20.566	20.696
		21.331	
		20.192	
3	Plastic sheet	21.690	21.260
		22.182	
		19.91	
4	Sponge method	26.461	26.199
		26.908	
		25.230	

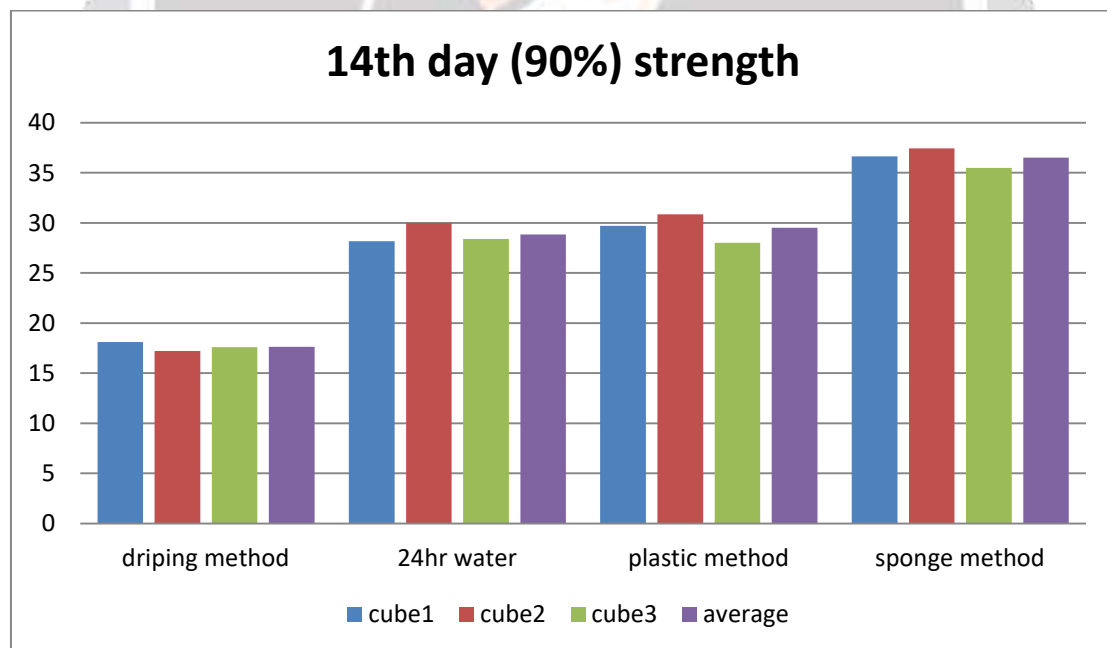
**Table -2:** Curing strength after 7 days. (65%)



**Chart -2:** Curing strength after 7 days. (65%)

Sr. No.	Type of method.	strength (N/MM <sup>2</sup> )	Average (N/MM <sup>2</sup> )
1	Dripping Method	18.115	
		17.199	17.637
		17.599	
2	24 hr water	28.159	
		29.997	28.850
		28.395	
3	Plastic sheet	29.699	
		30.847	29.515
		27.999	
4	Sponge method	36.639	
		37.419	36.512
		35.479	

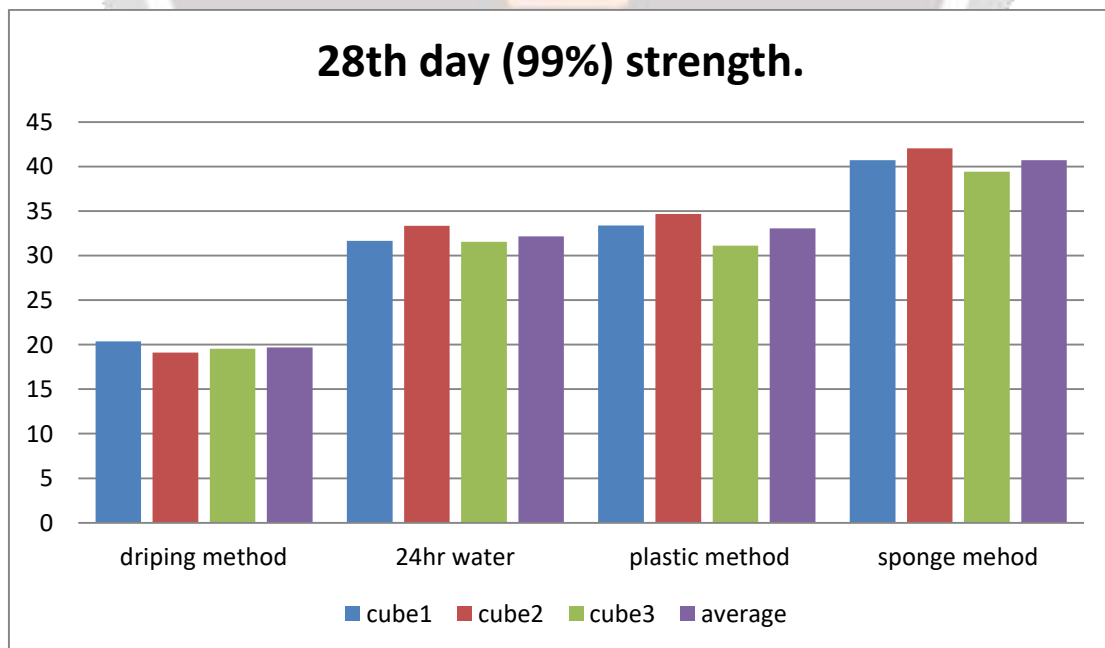
**Table -3:** Curing strength after 14 days. (90%)



**Chart -3:** Curing strength after 14 days. (90%)

Sr. No.	Type of method.	strength (N/MM <sup>2</sup> )	Average (N/MM <sup>2</sup> )
1	Dripping Method	20.355	
		19.111	19.673
		19.555	
2	24 hr water	31.64	
		33.33	32.173
		31.55	
3	Plastic sheet	33.37	
		34.66	33.04
		31.11	
4	Sponge method	40.71	
		42.044	40.72
		39.422	

**Table -4:** Curing strength after 28 days. (99%)



**Chart -4:** Curing strength after 28 days. (99%)

## CONCLUSIONS

The conclusion of this paper that we have introduced a new technique of water curing in construction industry. This is new technique in civil industry. This sponge curing technique is efficient than other conventional method of curing. Using of this curing method wastage of water is reduced and it's also help to improving the compressive strength of concrete. This is easy to applied and easy to reuse for other curing member. This sponge curing method is more economical. In this method less amount of water used for curing, so cost of construction is also minimizing. This method is more suitable where less amount of water is available such as Rajasthan, Latur, Usmanabad, etc.

## REFERENCES :

- [1] M. Naderi, R. Sheibani, and M. A. Shayanfar , “ Comparison Of Different Curing Effects On Concrete Strength”.
- [2] Camilla Pires Dos Santos, Simone Rosa Da Silva And Cezar Augusto Cerqueira, “Water Consumption In Construction Sites In The City Of Recife / PE”.
- [3] ACI Committee 308, Standard Practice for Curing Concrete, ACI 308-92, Reapproved 1997, American Concrete Institute, Farmington Hills, Michigan, 1997, 11 pages.
- [4] Nirav R Kholia, Prof. Binita A Vyas And Prof. T. G.Tank , “Effect On Concrete By Different Curing Method And Efficiency Of Curing Compounds – A Review”.
- [5] Mohamed S. Afifi and Teaching Assistant, “Internal Curing Of High Performance Concrete Using Lightweight And Recycled Concrete Aggregates”, 2016.
- [6] A. M. Neville: Properties of concrete, Fourth and Final Edition Standards update to 2002, pp323-326.
- [7] Steven H. Gebler, Chairman and Cecil L. Jones, “Guide to Curing Concrete”
- [8] Prof. Nanak J Pamnani, Dr. A.K. Verma, Dr. D.R. Bhatt, “Comparison Of Compressive Strength Of Medium Strength Self Compacted Concrete By Different Curing Techniques, 2013.



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