

# Self Compacting Concrete

Abhishek Singh Chandel<sup>1</sup>, Sanjeev Kumar Verma<sup>2</sup>

Department of Civil Engineering

<sup>1</sup>Research Scholar , Technocrats Institute of Technology, Rajiv Gandhi Technical University, Anand Nagar, Bhopal, Madhya Pradesh  
462022, India

<sup>2</sup>Associate Professor, Technocrats Institute of Technology, Rajiv Gandhi Technical University, Anand Nagar, Bhopal, Madhya Pradesh  
462022, India

**Abstract-** Due to well-controlled conditions, the initiation of SCC in the precast concrete is successful. But on the field, the growth is slower, as the product is more sensitive. Concrete which is made by the use of Super Plasticizers and Viscosity Modifying Agents (VMA) and does not needs compaction, removes air voids itself is known as Self compacting concrete (SCC). In this paper the properties of SCC in comparison to normal concrete has been discussed.

**Keywords-** Self compacting concrete, Fiber, Super-plasticizers, Admixture.

## I. INTRODUCTION

In Japan and Europe, Self-compacting concrete was initially developed. It is a type of concrete that is capable to flow and fill every division of the corner of the formwork (In shuttering), even when the dense reinforcement is present, purely by means of its own weight and exclusive of any vibration or other type of voids removal process.

It is a type of concrete that is capable to flow and fill every division of the corner of the formwork (In shuttering), even when the dense reinforcement is present, purely by means of its own weight and exclusive of any vibration or other type of voids removal process.

Use of recycled or waste materials for the construction of civil structures is a matter of great significance in this century. Use of waste materials in construction industry reduces the utilization of Portland cement per unit volume of concrete. Numerous researches have been listed on the global growth of SCC and its micro-social system and strength aspects. Instead of various researches and construction systems conducted widespread, the Bureau of Indian Standards (BIS) has not fixed out a standard mix method to get proper mix design trials and self-compact capacity testing methods. The behavior of Self Compacting Concrete is same as that of conventional concrete comprises of binder, fine aggregate, coarse aggregates, water, fines and admixtures.

Important reasons behind the increased use of supplementary materials in cement concrete are

To reduce the consumption of cement though replacing the cement with materials having cementitious properties.

To improve the properties of fresh and hardened concrete. Recently, several researchers produced high performance concrete by reducing water/cement ratio through the application of super-plasticizers and ultrafine mineral admixtures.

## Objective Of Study

The main purpose of this study is to explore the possibility of utilizing waste products in concrete production and to compare the properties of SCC to normal concrete.

## II. LITERATURE REVIEW

Later on many researchers worked on SCC to enhance the quality and strength of concrete.

Emara et al. (2018) did the experimental study to know the effect and optimization of self-compacting rubberized concrete by using Taguchi method. Design of experiment was carried out through orthogonal array to accommodate four factors with four levels. These factors are the percentage of coarse rubber, fine rubber, viscocrete and fly ash in the concrete mix. To study the performance features of self-compacting rubberized concrete, the S/N ratio and the analysis of variance are utilized. The result specifies that there is a drop in the strength with increasing rubber content but apparently increase in impact resistance has been observed.

Khalil et. al. (2015) worked on the mechanical properties and workability of Self compacting rubberized concrete in order to diminish the negative effect of rubber aggregate on the characteristics.

The effects on the mechanical properties of FRC are analyzed through the volume fraction and length of basalt fiber has been noticed by Jiang et al (2014). The upshot specifies that adding basalt fiber appreciably enhances the flexural strength, tensile strength and toughness index.

Whereas, there is no any major change in compressive strength observed. Besides this, the length of basalt fiber presents the effects on the mechanical properties.

An experimental study has been performed by Bhalchandra et.al. (2012) to notice the change in compressive strength and flexural strength over normal SCC by using steel fibre content and found the 25.75% and 19.47% increment in compressive strength and flexural strength respectively over normal SCC.

Abdulhadi et al. (2012) used polypropylene fiber in M30 grade concrete. Compressive, split tensile strength and a relation between them has been obtained. The range of polypropylene fiber is kept between 0% to 1.2% volume fractions by weight of cement.

### III. DISCUSSIONS AND CONCLUSIONS

From the papers reviewed following points of conclusion can be drawn-

- Instead of its short history, SCC has confirmed itself as a innovative step forward in concrete technology.
- It can be observed by cost analysis that SCC in precast concrete plants is more economically than conventional concretes. Cost comparisons should always be made on the basis of integral costs.
- There is a significant future for self compacting fiber reinforced concretes. The most vital task for research is to improve SCC's with reduced sensitivity to variations in constituents and environmental influences.

### REFERENCES

- [1] M. A. Emara, F. M. Eid, A. A. Nasser, M. A. Safaan "Prediction of Self-Compacting Rubberized Concrete Mechanical and Fresh Properties using Taguchi Method", Journal of Civil & Environmental Engineering Vol. 8, Issue 2, 2018.
- [2] J. Chaohua Jiang, K. Fan, F. Wu, D. Chen, "Experimental study on the mechanical properties and microstructure of chopped basalt fiber reinforced concrete", Materials and Design 58 (2014) 187–193.
- [3] E. Khalil, M. Abd-Elmohsen, M.A. Anwar (2015) Impact resistance of rubberized self-compacting concrete. Water Sci 29: 45-53.
- [4] S.A. Bhalchandra and A.B. Pawase, "Performance of Steel Fibre Reinforced Self Compacting Concrete", International Journal of Computational Engineering Research (IJCER) Vol. 2 Issue.

- [5] M. Abdulhadi, A comparative Study of Basalt and Polypropylene Fibers Reinforced Concrete on Compressive and Tensile Behavior", International Journal of Engineering Trends and Technology (IJETT) – Volume 9 Issue 6- March 2012.