



## Experimental study on Strength of Concrete by using Metakaolin and M-Sand

P. Jaishankar\* and Vayugundlachenchu Eswara Rao

School of Civil Engineering, SASTRA University, Thanjavur, Tamilnadu, 613402, India.

**Abstract :** Concrete is that pourable mix of cement, water, sand, and gravel that hardens into a super-strong building material. Supplementary cementing materials (SCM) have become an integral part of concrete mix design. These may be naturally occurring materials, industrial wastes or, by products or the ones requiring less energy to manufacture. Some of the commonly used SCM are fly ash, silica fume (SF), GGBS, rice husk ash and metakaolin (MK), etc. Metakaolin is obtained by the calcination of kaolinite. It is being used very commonly as pozzolanic material and has exhibited considerable influence in enhancing the mechanical and durability properties of concrete. M-sand is crushed aggregates produced from hard granite stone which is cubically shaped with grounded edges, washed and graded with consistency to be used as a substitute of river sand. Usage of M-Sand can overcome the defects occurring in concrete such as honey combing, segregation, voids, capillary, etc. In this project, experimental study was carried out on M-30 grade of concrete. In this concrete mixes sand was replaced by M-sand by a constant percentage and cement was replaced by metakolin in various percentages such as 5%, 10%, 15% and 20%. Concrete specimens containing metakaolin were studied for their compressive, split tensile and flexural strengths according to Bureau of Indian standards. The results thus obtained were compared and examined with respect to the control specimen. From the test results, it was found that 15% of the Ordinary Portland cement could be beneficially replaced with themetakaolin to improve compressive, split tensile and flexural strengths of concrete.

**Keywords:** M-Sand, Metakaolin, Compressive, Split tensile, Flexural strength.

P. Jaishankar *et al* /International Journal of ChemTech Research, 2016,9(5),pp 446-452.

\*\*\*\*\*