World Academy of Science, Engineering and Technology
International Journal of Civil and Architectural Engineering
Vol:9, No:11, 2015

Effect of Hybrid Fibers on Mechanical Properties in Autoclaved Aerated Concrete

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Abstract : Fibrous autoclaved aerated concrete (FAAC) is concrete containing fibrous material in it which helps to increase its structural integrity when compared to that of convention autoclaved aerated concrete (CAAC). These short discrete fibers are uniformly distributed and randomly oriented, which enhances the bond strength within the aerated concrete matrix. Conventional red-clay bricks create larger impact to the environment due to red soil depletion and it also consumes large amount to time for construction. Whereas, AAC are larger in size, lighter in weight and it is environmentally friendly in nature and hence it is a viable replacement for red-clay bricks. Internal micro cracks and corner cracks are the only disadvantages of conventional autoclaved aerated concrete, to resolve this particular issue it is preferable to make use of fibers in it.These fibers are bonded together within the matrix and they induce the aerated concrete to withstand considerable stresses, especially during the post cracking stage. Hence, FAAC has the capability of enhancing the mechanical properties and energy absorption capacity of CAAC. In this research work, individual fibers like glass, nylon, polyester and polypropylene are used they generally reduce the brittle fracture of AAC.To study the fibre's surface topography and composition, SEM analysis is performed and then to determine the composition of a specimen as a whole as well as the composition of individual components EDAX mapping is carried out and then an experimental approach was performed to determine the effect of hybrid (multiple) fibres at various dosage (0.5%, 1%, 1.5%) and curing temperature of 180-2000 C is maintained to determine the mechanical properties of autoclaved aerated concrete. As an analytical part, the outcome experimental results is compared with fuzzy logic using MATLAB.

Keywords : fiberous AAC, crack control, energy absorption, mechanical properies, SEM, EDAX, MATLAB
Conference Title : ICCME 2015 : International Conference on Civil and Materials Engineering
Conference Location : Venice, Italy
Conference Dates : November 09-10, 2015