

Development and Performance Evaluation of High Volume Fly Ash Blended Cement – A Step towards True Sustainable Development

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This paper presents extensive comparative test data on the mechanical and durability properties of concrete made with High Volume Fly Ash blended cement vis-à-vis HVFA concrete having fly ash as pozzolanic addition (fly ash incorporation level ranging from 30 to 50% by weight).

The parameters investigated include mechanical properties such as compressive strength, flexural strength and Modulus of elasticity. Durability properties were assessed by rapid chloride penetrability, initial surface absorption, ultra sonic pulse velocity, resistivity, drying shrinkage and abrasion resistance test.

It was observed that regardless of the fly ash incorporation level, the concrete made with High volume fly ash blended cement outperformed the High Volume Fly Ash concrete, in each of the parameters and at all ages. Micro-structural studies also support these observations.

The paper also attempts to correlate the superior performance characteristics of High volume fly ash blended cement concrete to the observed higher pozzolanic reactivity of the fly ash component in such cement paste matrix.

The authors conclude that for simplifying the production of high volume fly ash concrete and to eliminate variability due to job site conditions, some of its operations could be moved to cement plant. For countries like India this class of cement can play an important role in meeting the huge demand for infrastructure and also help the country in its strides towards sustainable Development.