5. Properties of Concrete Incorporating Carbon-Free Fly Ash - Evaluating Fresh and Hardened Concrete Mixed in a Plant -

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Carbon-free fly ash, or cfFA, is a new concrete admixture in which the amount of unburned carbon is reduced to less than 1.0% by thermal reforming. Compared to standard fly ash type II, cfFA facilitates the control of air content in the concrete, thereby all but eliminating the adsorption of AE agent by unburned carbon.

We evaluated the workability of fresh concrete via an indoor test and a test involving actual machine mixing. In addition, we evaluated the properties of hardened concrete by carrying out a trial test with two cube specimens measuring 1 m per side. The trial included a compressive strength test, electrical resistivity test, and salt water immersion test.

The results confirmed that adding cfFA makes it possible to reduce the amount of AE agent compared to the case of using unreformed fly ash, thereby improving workability, in particular “gap passing property” which is a measure of the ease of passage between reinforced bars, and to reduce the penetration of chloride ions, the likely specific cause of salt damage to concrete. The authors have applied cfFA to work involving actual concrete structures, a port bank and water gate, achieving satisfactory pumpability and reduction of salt damage.

Key words: carbon free fly ash, concrete mixed in a plant, gap passing performance, salt shielding performance