

Strength and chloride resistance of blended Portland cement mortar containing palm oil fuel ash and fly ash

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Abstract

This paper presented a study on the strength and chloride resistance of mortars made with ternary blends of ordinary Portland cement (OPC), ground palm oil fuel ash (POA), and classified fly ash (FA). The mortar mixtures were made with Portland cement type I containing 0-40wt% FA and POA. FA and POA with 1wt%-3wt% retained on a sieve No.325 were used. The compressive strength and rapid chloride penetration depth of mortars were determined. The results reveal that the use of ternary blended cements produces good strength mortars. The use of the blend of FA and POA also produces high strength mortars and excellent resistance to chloride penetration owing to the synergic effect of FA and POA. A mathematical analysis and two-parameter polynomial model were presented to predict the compressive strength. The mathematical model correlated well with the experimental results. The computer 3-D graphics of strength of the ternary blended mortars were also constructed and could be used to aid the understanding and the proportioning of the blended system.

Key words: compressive strength; chloride resistance; fly ash; palm oil fuel ash; mortar