Microstructure And Durability Of Mortars Modified With Medium Active Blast Furnace Slag

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Abstract: Mechanical characteristics and durability properties of blast furnace slag cement composites largely depend on the hydraulic activity of the slag. In this paper, a Granulated Blast Furnace Slag with a low reactivity index is used in modifying mortar composition. Microstructure and durability of mixes containing 0%, 30% and 50% of slag as substitution to OPC are respectively compared and analyzed. Water porosity, Mercury Intrusion Porosity and pore size distribution are studied after 28, 90 and 360 days of wet curing. A qualitative microstructure analysis of mortars is proposed with Scanning Electron Microscope (SEM). The durability of mortar is evaluated through capillary water absorption and chloride diffusion tests. The results indicate a finer porosity and lower water absorption for slag mortars at old ages (90 and 360 days). Moreover, lower chloride diffusion for 50% blast furnace slag substitution is observed.

Keywords: Environment; Mortar; Blast furnace slag; Hydraulic activity; Pore structure; Microstructure; Durability; Chloride diffusion