



Effect of Air-Cooled Slag Fine Aggregate on the Mechanical and Physical Properties of Cement Mortar

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Abstract—The depleting trend of natural sand due to excessive increase in the production of concrete in the construction industry necessitates the utilization of by-products. Air-cooled furnace slag is a by-product and an environmental concern. In this study, air-cooled furnace slag (ACBFS) aggregate were used to replace natural sand at a level of 0%, 10%, 20%, and 50% by weight. Cement mortar specimens were made and studied via compressive, flexure, ultrasonic pulse velocity, splitting tensile strength, and mercury intrusion porosimetry tests. The results indicate that the addition of slag aggregate at a replacement level of 20% does not compromise the performance of cement composites. However, replacing sand beyond 20% reduced the mechanical and physical properties. It means 20% is the optimal content for replacement of sand with slag fine aggregate.

Keywords— Air-Cooled Slag, Fine Aggregate, Mortar, Mechanical Properties, Physical Properties