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Utilization of recycled glass waste as partial replacement of fine aggregate in concrete production

Abstract

Glass dust waste creates chronic environmental problems, mainly due to the inconsistency of waste glass streams. Glass is widely used in our lives through manufactured products such as sheet glass, bottles, glassware, and vacuum tubing. Glass is an ideal material for recycling. The use of recycled glass helps in energy saving. The increasing awareness of glass recycling speeds up inspections on the use of waste glass with different forms in various fields. One of its significant contributions is to the construction field where the waste glass was reused for concrete production. The properties of concretes containing glass dust waste as fine aggregate were investigated in this study. Glass dust waste was used as a partial replacement for sand at 10%, 20% and 50% of concrete mixes. Compression strength for 7, 14 and 28 days concrete of age were compared with those of concrete made with natural fine aggregates. The results proved that highest strength activity given by glass dust waste after 28 days. The compressive strength of specimens with 10% glass dust waste content were 32.9373 MPa, higher than the concrete control specimen at 28 days. Using glass dust waste in concrete is an interesting possibility for economy on waste disposal sites and conservation of natural resources.

Keywords;

Compressive Strength, Glass Dust Waste, Recycle Material in Concrete, Recycled Glass