

Effect of Processed Fly ash on Cement Mortar for Standard Fine and Normal Sand

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ABSTRACT

This paper investigates the effect of processed flyash, used as partial substitute for cement, on the performance of cement mortar with normal sand available locally and standard fine sand. This study involves the replacement levels of fly ash to cement at 5%, 10%, 20%, 30%, 40%, 50 % and 70% for 1:3 mix proportions. Mortar cubes are tested for compressive strength at 7, 14, 28, 56, 91 and 121 days. The tension tests on briquettes are conducted for 28 days. Surface morphology and EDX of hardened samples were studied under scanning electron microscope at 28 days of curing. The compressive strength and tensile strength increases up to 20 % replacement levels and marginal decrease in strength up to 50% when compared with the control mix for both types of sand. By reading the surface morphology of hardened specimens at 30%, 40% and 50% with reference mix it clearly indicates that surface texture is more uniform and pore diameter is less at higher replacement level. The EDX spectrum of hardened mixes shows that the silica content is less for lower replacement level and increasing more for higher replacement level. This trend was depicted in surface morphology as uniform texture.

Keywords: Flyash, standard sand, normal sand, compressive strength, tension, surface morphology and EDX.