



Effect of Nano-Silica, Nano-Titania and Carbon Nanotubes on the Fresh and Hardened Properties of White Cement Mortars

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Abstract—White cement is a distinctive binder due to its white color. It is used in the monuments, sculpture, tiles, decorative work and in the construction projects where whiteness is required by the architects or clients. White cement is expensive than Ordinary Portland Cement (OPC) due to its raw materials and manufacturing process. This study attempts to investigate the interaction of nanomaterials with the white cement concrete. For this, white concrete was produced with varying amount of nano-titanium dioxide (TiO_2), nano-silica (SiO_2) and Carbon Nanotubes (CNT). Water-cement ratio was fixed (0.40). Slump, compressive strength and flexural strength were measured according to the recommendations of American Standards for Testing Materials. The effect of each nanomaterial was observed to be different on the fresh and hardened properties. This paper recommends appropriate dosage for each nanomaterial in the white cement mortars.

Keywords— White Cement, Nano-Titania, Nano-Silica, Carbon Nanotubes, Fresh Properties, Hardened Properties, Mortars