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Green Cement Composite Concept Reinforced by Graphite Nano-Engineered Particle Suspension for Infrastructure Renewal Material

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Abstract

Renewal of infrastructure is significant concern in most countries around the globe. Sustainable renewal of infrastructure needs an innovative concept that is inexpensive, quickly hardened, and strength gained at the early age, such as green cement composite concept explained in the study. This article aims to present the physical properties of green cement composite concept reinforced by the graphite nano-engineered particle suspension (GNPS) by means of sustainability, stiffness, hydraulic lateral formwork pressure, and strength gain at early age. Results of numerous tests measured, such as the optical atomic absorbance spectra, the initial and final stiffness of time, the flow, and the early age compressive strength of green composite concept, are discussed. In all tests, the usability of GNPS is displayed as innovative original nano-engineered-suspension for infrastructure renewal material and for manufacturing of green cement composite concept effectively. For that reason, the results of this work could bring new materials to cement and concrete producers, specifiers, and end-users; and new market could emerge to provide the GNP and the GNPS in additive and admixture forms

Keywords: A.Nano-structures; A.Recycling; B.Mechanical properties; B.Physical properties; Green Cement Composite, Infrastructure Renewal Material, Graphite Nano-Engineered Particle Suspension

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