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Oveys Afzali Naniz, Moosa Mazloom

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Effects of colloidal nano-silica on fresh and hardened properties of self-compacting lightweight concrete

Oveys Afzali Naniz[a], Moosa Mazloom[a*]

Department of Civil Engineering, Shahid Rajaee Teacher Training University, Lavizan, Tehran, Iran

oveys.afzali@sru.ac.ir
mazloom@sru.ac.ir

*Corresponding author.

Abstract

The aim of this study is to investigate the effects of different levels of colloidal nano-silica (CS) on fresh and hardened properties of self-compacting lightweight concrete (SCLC). For this purpose, two concrete series including 16 concrete mixes with two water to binder (w/b) ratios of 0.35 and 0.45 were considered. The percentage of CS that replaced cement were 0%, 1%, 3% and 5%. Also, mixtures containing 0% and 10% MS were considered. The fresh properties of SCLCs were observed in terms of slump flow diameter and time, J-ring diameter, V-funnel time and U-box tests. The hardened properties were determined through mechanical properties (compressive strength, splitting tensile strength, flexural strength) and non-destructive tests (electrical resistivity and ultrasonic pulse velocity). The