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Nanosilicon as a smart waterproofing admixture in cement base material

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Permeation of water as well as other fluids in concrete can result in degradation and other fouling aesthetic problems which shorten concrete structures' life. Several research studies have been undertaken to produce waterproofing additives that will extend the service life of concrete elements. Consequently, a great deal of repair and maintenance costs can be avoided. The aim of this research is to develop a smart waterproof cement base material using nanosilicon. The material is being characterized using Field Emission Scanning Electron Microscope (FESEM), Energy dispersion Spectroscopy (EDS), Fourier Transmission Infrared (FTIR), X-ray Diffraction (XRD) and Water Contact Angle Test (WCA). Different amount of nanosilicon suspension is added to mortar during mixing to obtain the optimum quantity. From this study, the result shows that capillary water absorption has been reduced by 55% as compared to control specimen. Also the admixture has increased the slump of the mortar by 19 mm (12%). Other necessary tests such as sorptivity, water vapour permeability, ultrasonic pulse velocity, compressive strength and carbonation will be conducted to establish the effect of nanosilicon. Furthermore, microstructure would be conducted to maximize the reliability of the results. In conclusion, nanosilicon is a good waterproofing admixture.

Biography

Muhd Zaimi Abd Majid is Research Dean of Construction Research Alliance, Faculty of Civil Engineering, Universiti Teknologi Malaysia, Malaysia. He has published more than 100 peer-reviewed papers, in national and international Journals.

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