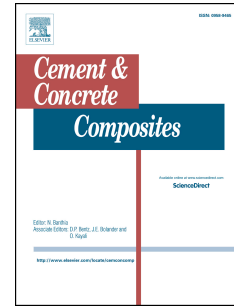


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Effectiveness of preconditioning regimes for assessing water permeability of high performance concrete

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Abstract

Saturating high performance concrete (HPC) on site for assessing water permeability is a challenge. This paper reports a testing programme established to assess the reliability and efficiency of two field saturation approaches, viz. vacuum saturation and ponding. The water permeability test results after applying the vacuum saturation and ponding were compared with that after incremental immersion. It is found that ponding was unable to remove the influence of moisture, while vacuum saturation can achieve this for wet concretes. Although the influence of moisture can be removed for different HPCs with high initial moisture contents by using the vacuum saturation method, it is not effective when the initial moisture content is low. The results obtained from numerical simulation model and the electrical resistance measurements after incremental immersion suggested that the water permeability of HPCs can be accurately determined if the surface region (140 mm width and 25 mm depth) is fully saturated.

Key words: *in situ* water permeability test, influence of moisture, high performance concrete, ponding saturation regime, vacuum saturation regime

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