

A New Performance Test Method for Alkali-Silica Reaction

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Current standardized test methods for identifying alkali-silica reactive aggregates cannot be used as performance tests to determine the risk of damaging reaction of a specific combination of materials or “job mixture.” This paper presents data for a new test that aims to provide a continuous supply of external moisture without either augmenting or reducing the alkalis in the concrete (job) mixture under test. Concrete cylinders are stored in cylindrical containers with a slightly larger diameter such that there is a small annulus of 1 to 2-mm around the concrete specimen. This annulus is filled with a “model pore solution,” which is determined based on the composition of the binder in the job mixture. The sealed containers are then stored at either 38°C or 60°C and the length-change of the specimens is measured periodically. Results are shown for a wide series of mixtures using combinations of materials that have been previously used to produce concrete blocks for storage on outdoor-exposure sites; consequently, there are long-term field-performance data for the mixes under test. The results demonstrate that the new test method is better able to predict the performance of the job mixtures than existing tests. A number of modifications are proposed for future testing.

Keywords: *alkali-silica reaction, durability, job mixture, performance test method.*

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