

Behavior of Masonry Mortar Containing a Non-Harmful Antifreeze Admixture

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Abstract:

One of the major hurdles to a wider adoption of antifreeze admixtures in cold weather concreting applications is a lack of performance data for the increasing number of products currently available on the market. This paper assesses the performance of an existing non-harmful commercial antifreeze admixture (MNC-C15) in masonry mortar. The performance was evaluated in terms of strength gain at 7 days, 28 days and 56 days at two different temperatures (-10°C and -15°C). The potential need for heat protection before exposure to subfreezing temperatures was also evaluated. The results showed that the control mortar gained little to no strength during the curing period in subfreezing conditions. The mortar with the antifreeze admixture, on the other hand, showed appreciable strength gain even without an initial period of protection from freezing, suggesting that the admixture allowed the hydration reactions to proceed at temperatures of -10°C and -15°C. However, a freezing prevention period between 6 and 12 hours was necessary for the mortar to reach an acceptable compressive strength at those temperatures.

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DOI: 10.70803/001c.137720

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