

Effect of Mineral Admixture on Self-Healing Performance in Concrete

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Abstract : Cracks in concrete commonly provide the passages of ingresses of aggressive and harmful ions into concrete inside and thus reduce the durability of concrete members. In order to solve this problem, self-healing concrete based on mineral admixture has become a major issue. Self-healing materials are those which have the ability of autonomously repairing some damages or small cracks in concrete structures. Concrete has an inherent healing potential, called natural healing, which can take place in ordinary concrete elements but its power is limited and is not predictable. The main mechanism of self-healing in cracked concrete is the continued hydration of unreacted binder and the crystallization of calcium carbonate. Some mineral admixtures have been found to promote the self-healing of cementitious materials. The aim of this study is to investigate the effect of mineral admixture on the self-healing performances of high strength concrete. The potential capability of self-healing of cementitious materials was evaluated using isothermal conduction calorimeter. The self-healing efficiencies were studied by means of water flow tests on cracked concrete specimens. The results show a different healing behaviour depending on presence of the crystalline admixture.

Keywords : mineral admixture, self-healing, water flow test, crystallization

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