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# **Impact of natural weathering on medium-term self-healing performance of fiber reinforced cementitious composites with intrinsic crack-width control capability**

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## **Abstract**

The paper investigates the medium-term self-healing performance of fiber reinforced cementitious composites with intrinsic crack-width control capability under natural weathering. The pre-cracked specimens with different damage levels are exposed to various humidity conditions, namely, water submersion, natural weathering, and a laboratory environment with constant humidity. The medium-term self-healing performance is evaluated using a resonant frequency test, tensile test, SEM, and EDX. It is concluded that the medium-term cracked specimens can moderately recover their mechanical properties within 90 days after being submerged in water or exposed to natural weathering. In particular, they are able to resume the multiple cracking behavior and exhibit a reloading strength larger than the preloading strength. Furthermore, the identified compositions of the medium-term healing products for specimens exposed to water and natural weathering conditions are similarly characterized. The reported results imply that effective medium-term self-healing can be realized in fiber reinforced cementitious composites with intrinsic crack-width control capability under natural weathering.

**Keywords:** self-healing; fiber reinforced concrete; mechanical behavior; natural

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