

About the Interface Bonding Safety of Adhesively Bonded Concrete Joints Under Cracking: A Fracture Energetic Approach

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Abstract : Adhesives are increasingly being used in the construction sector. On the one hand, this concerns dowel reinforcements using chemical anchors. On the other hand, the sealing and repair of cracks in structural concrete components are still on the rise. In the field of bonding, the interface between the joined materials is the most critical area. Therefore, it is of immense importance to characterize and investigate this section sufficiently by fracture analysis. Since standardized mechanical test methods are not sufficiently capable of doing this, recourse is made to an innovative concept based on fracture energy. Therefore, a series of experimental tests were performed using the so-called GF-principle to study the interface bonding safety of adhesively bonded concrete joints. Several different structural adhesive systems based on epoxy, CA/A hybrid, PUR, MS polymer, dispersion, and acrylate were selected for bonding concrete substrates. The results show that stable crack propagation and prevention of uncontrolled failure in bonded concrete joints depend very much on the adhesive system used, and only fracture analytical evaluation methods can provide empirical information on this.

Keywords : interface bonding safety, adhesively bonded concrete joints, GF-principle, fracture analysis

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