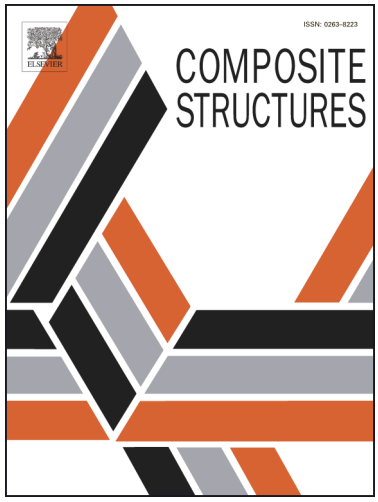

A failure analysis of concrete composites incorporating fly ash during torsional loading

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A failure analysis of concrete composites incorporating fly ash during torsional loading

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Abstract

This paper presents a comprehensive study of the cracking processes of concrete specimens containing fly ash (FA). Concrete composites with the additives of: 0%, 20% and 30% FA were analysed.

In the paper we analysed failure processes in the concrete specimens subjected to torsion. The studies examined effect of the FA additive on the work of fracture W_f . Furthermore values of critical torsion moment T_c and dissipated energy Δ_w, at the fracture initiation point were assessed. During tests all stages of the crack growth, starting from initiation to specimen failure, were analysed (Fig. 6).

It can be concluded that the FA additive changes the behaviour of the concrete during cracking process. 20% FA additive causes a small increase of the W_f , while 30% FA additive causes a significant decrease in the work of fracture. On the other hand value of Δ_w is the smallest in concrete containing 20% FA while the greatest in composites with the addition of 30% FA.

Keywords: Composite, fly ash, torsional loading, failure analysis, fracture toughness, work of fracture, cracking.

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