

Accepted Manuscript

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PII: S0959-6526(16)30069-5

DOI: [10.1016/j.jclepro.2016.02.148](https://doi.org/10.1016/j.jclepro.2016.02.148)

Reference: JCLP 6858

To appear in: *Journal of Cleaner Production*

Received Date: 4 November 2015

Revised Date: 23 February 2016

Accepted Date: 26 February 2016

Please cite this article as: Mastali M, Dalvand A, Sattarifard A, The impact resistance and mechanical properties of reinforced self-compacting concrete with recycled glass fiber reinforced polymers, *Journal of Cleaner Production* (2016), doi: 10.1016/j.jclepro.2016.02.148.

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The impact resistance and mechanical properties of reinforced self-compacting concrete with recycled glass fiber reinforced polymers

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Abstract

Experimental and statistical analyses are represented considering the impact resistance and mechanical properties of self-compacting concrete reinforced with recycled Glass Fiber Reinforced Polymers (GFRP). Specimens were reinforced with recycled GFRP in three groups, including 0.25%, 0.75%, and 1.25% of fiber volume fractions. An extensive experimental program including two hundred and fifty two specimens were prepared and tested to characterize the impact resistance and mechanical properties of the reinforced self-compacting concrete with glass fiber reinforced polymers. Scanning Electron Microscope images were used to perceive the failure mechanism of recycled glass fiber in the matrix. Then, the relatively large and reliable collected data from the experimental tests was used to start statistical and analytical analysis.

The results showed that adding recycled glass fiber reinforced polymers results in improving the impact resistance and mechanical properties of the reinforced self-compacting concrete with glass fiber reinforced polymers. Moreover, the statistical data analysis revealed that the

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