

## Mechanical Properties of Self-Compacting Concrete with Three-Dimensional Steel Fibres

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**Abstract :** Fiber-reinforced self-compacting concrete (FRSCC) combines the benefits of SCC of high flowability and randomly dispersed short fibres together in one single concrete. Fibres prevent brittle behaviour and improve several mechanical properties of SCC. In this paper, an experimental investigation of the effect of three-dimensional (3D) fibres on the mechanical properties of SCC has been conducted. Seven SCC mixtures, namely SCC with no fibres as a reference mix, and six 3D steel fibre reinforced SCC mixes were prepared. Two different sizes of 3D steel fibres with perimeters of 115 mm and 220 mm at different fibre contents of 1%, 2%, and 3% (by cement weight) were considered. The mechanical characteristics were obtained through compressive, splitting tensile, and flexural strength tests. The test results revealed that the addition of 3D fibres improves the mechanical properties of SCC.

**Keywords :** self-compacting concrete, three-dimensional steel fibres, mechanical properties, compressive strength, splitting tensile strength, flexural strength

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