

## **EFFECT OF DISCRETE STEEL FIBERS ON THE BEHAVIOUR OF R. C. BEAMS EXPOSED TO FIRE**

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### **ABSTRACT**

The main objective of this paper is study the influence of steel fibers on the behavior of R.C beams exposed to fire under loading on the behaviour of reinforced concrete (RC) beams under different fire and cooling conditions. Eighteen beams were tested with rectangular section its dimensions (120 \* 250 \* 1650) mm, divided into six groups, using different different volume of fraction ( $V_f$ ) equal to (0.0%, 0.50%, and 0.75%); also use different compressive strength (35MPa, 65MPa). Groups one and two were tested at room temperature. The third and fourth groups were loaded by 35% of the load measured at room temperature and then subjected to a temperature of 500 °C for half hour then the load was increased up to failure. The fifth and sixth groups were loaded by 35% of the load measured at room temperature and then subjected to a temperature of 500 °C for half hour then cooling by water then the load was increased up to failure. Analysis of test results shows that adding discrete steel fibres to high strength concrete (HSC) increased the residual stiffness of the tested specimens after firing and decreased the rate of the deflection gain during firing. And also, the ductility of RC tested beam exposed to fire improved. Finally, the recommend optimum ratio of discrete steel fibres depends on the compressive strength, where for NSC the optimum ratio could be 0.50% of the total concrete weight, and for HSC the optimum ratio could be more than 0.75% of the total concrete weight.

**KEYWORDS:** Discrete Steel Fibers, Fire Condition, RC Beam, Ductility & Deformability