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## Effect of type and volume fraction of recycled-tire steel fiber on durability and mechanical properties of concrete

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### Abstract

Tire-bead steel wires derived from the pyrolysis of waste-tires can be converted into the discrete reinforcement for fiber-reinforced concrete (FRC). This study for the first time presents the information about selecting the optimum dosage of recycled steel-fibers (RSF) in FRC application. Therefore, two most common types of RSF i.e., plain RSF (PRSF) and twisted RSF (TRSF) were incorporated in a high strength plain concrete (PC) at seven different volume fractions i.e., 0%, 0.25%, 0.5%, 0.75%, 1%, 1.5% and 2%. Both physical and mechanical properties of FRCs were studied including density, compressive strength- $f_{cu}$ , modulus of rupture- $f_R$ , splitting-tensile strength- $f_{sp}$ , ultra-sonic pulse velocity- $UPV$ , and water absorption- $WA$ . The results revealed that TRSF performed better than PRSF in overall mechanical performance. Maximum compressive strength-

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