

Durability Properties of Polypropylene Fiber Reinforced Concrete

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ABSTRACT

Concrete is an inherently brittle material with a relatively low tensile strength compared to its compressive strength. Reinforcing with randomly distributed short fibers presents an effective approach to the stabilization of the crack system, improving the ductility and tensile strength of concrete. Polypropylene (P.P) fiber reinforcement is considered to be an effective method for improving the shrinkage cracking characteristics, toughness and impact resistance of concrete material. Even though fibers are widely used to improve mechanical properties of concrete, they may affect the workability and the flow characteristics of plain concrete.

Durability characteristics of plain concrete may be improved using polypropylene fibers. Several researches have been carried out on the mechanical properties of polypropylene fiber reinforced concrete; yet there are a few investigations on the durability properties of concrete containing polypropylene fibers.

In this paper, the effect of adding various percentages of P.P fibers to concrete on the durability of concrete is investigated. Water penetration, gas permeability, electrical resistivity and shrinkage were studied. Results show that adding P.P fibers to the concrete will decrease the shrinkage of concrete significantly. Although using these fibers does not improve the permeability of concrete notably.

KEYWORDS

Polypropylene fiber, durability, shrinkage

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