

Experimental method for investigation of impact of the addition of polymer fibers on drying shrinkage and cracking for concretes

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Abstract

This study presents an investigation of a fiber-reinforced concrete (FRC) with use of fibers of polypropylene, polyvinyl alcohol, and recycled polyester in the amount of 0.50%, seeking to analyze the impact of the fiber additions on mechanical properties, drying shrinkage, and cracking. Regarding flexural strength, a reduction of up to 25% of the value was observed for FRC. The residual strength of FRCs was increased values 20 times higher than the reference concrete. The addition of fibers also increased the void content of the matrices and, therefore, drying shrinkage of the reference matrix up to 74%. The fiber additions increased the internal tensile stresses of the FRC of up to 12.0 MPa. Besides the increase in resistance, the FRC presented formation cracks with openings 8 times smaller than the concrete.