

Behaviour of waste fiber concrete slabs under low velocity impact

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Abstract

This research investigates the impact resistance of concrete slabs with different volume percentage replacement ratios of waste plastic fibers (originally made from soft drink bottles) as follows : 1% ,0.5% and 1.5% . The specimens (100×100×100) were made to test compressive strength at age of (28 days) dimensions. The low-velocity impact test was conducted by the method of repeated falling mass where 1400gm steel ball was used. The ball falling freely from height of 2400mm on concrete panels of (50 ×500×500mm) having a mesh of waste plastic fiber. The number of blows that caused first crack and final crack (failure) were determined, according to the former obtained results , the total energy was calculated. Results showed an improvement in mechanical properties for mixes containing plastic fibers compared with reference mix. For compressive strength the maximum increase in compressive strength was equal to (3.2%) at 28 days age of test and it was equal to (26% days age of test for the mixture with plastic fiber content by volume equal to (1%) . The maximum value of increase was (28 days age of test and it was equal to (90 days age of test for the mixture with plastic fiber content by volume equal to (1.5%) . The maximum value of increase was (340%) at 90 days age of test.

Keywords

Waste plastic , PET, Compressive strength, Flexural strength, Impact Resistance, Low Velocity Impact