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 perecentage replacement ratios of waste plastic fibers (originaly made from soft drink bottles) as follows: 1%,0.5% and eht erapmoc ot redro ni decudorp xim ecnerefeR.1.5% 100×100×100) htiw sebuc ,sexim detceles eht roF .tlusermm) were made to test compressive strength at age of (saw tset (erutpuR fo suludoM) htgnerts laruxelF .syad (90 100 *100*500) fo elpmas smsirp gnisu detcudnoc oslamm) 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%) dna ,28 sega ta rebif citsalp gniniatnoc sexim rof shtgnerts laruxelF .syad (90) fo ega ta 90 days are higher than that of these of reference mix. The maximum value of increaseing was (28 rof (18% days age of test and it was equal to (90 rof (26% days age of test for the mixture with plastic fiber content by volume equal to (tnacifing is a dewohs stluseR. (1% srebif citsalp etsaw gninitnoc sexim lla fo ecnatsiser tcapmi yticolev-wol ni tnemevorpmi citsalp etsaw (1.5%) htiw xim taht detartsulli stluseR .xim ecnerefer htiw gnirapmoc nehw ehT .srehto eht naht eruliaf ta ecnatsiser tcapmi rehgih eht evig emulov yb srebif .(340%) ot lauge saw xim ecnerefer revo esaercni na fo edutingam

Keywords

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