

Mechanical properties and impact behavior of PET fiber reinforced selfcompacting concrete (SCC)

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Green concrete composite produced from Polyethylene terephthalate (PET) fibers may be considered an important issue in sustainable construction. Therefore, the behavior of self-compacting concrete (SCC) slabs containing PET fibers under impact loads was investigated. PET fibers from waste plastic were added to SCC with an aspect ratio of 28. One reference concrete mix, from which all other mixes were developed, was used to produce eight SCC mixers containing different volumetric ratios of plastic fibers percentages (0.25%, 0.5%, 0.75%, 1%, 1.25%, 1.5%, 1.75%, and 2%). Experiments showed that the inclusion of PET fibers in SCC results in an increase in compressive and flexural strengths. The behavior of SCC slabs under impact loading was studied. A significant improvement was found in the resistance to impact load and energy absorption capacity of slabs containing PET fibers. The increment in the time of max deflection for the concrete mixes containing PET fibers increased significantly, thereby indicating the enhanced capacity of SCC to absorb further energy under low velocity impact. This improvement in the behavior of SCC under impact by the inclusion of PET fibers may lead to further applications of this type of concrete in sustainable structures.