

Recycled Plastic Fibers for Controlling the Plastic Shrinkage Cracking of Concrete

Authors : B. S. Al-Tulaian, M. J. Al-Shannag, A. M. Al-Hozaimy

Abstract : Manufacturing of fibers from industrial or postconsumer plastic waste is an attractive approach with such benefits as concrete performance enhancement, and reduced needs for land filling. The main objective of this study is to investigate the effect of Plastic fibers obtained locally from recycled waste on plastic shrinkage cracking of concrete. The results indicate that recycled plastic RP fiber of 50 mm length is capable of controlling plastic shrinkage cracking of concrete to some extent, but are not as effective as polypropylene PP fibers when added at the same volume fraction. Furthermore, test results indicated that there was The increase in flexural strength of RP fibers and PP fibers concrete were 12.34% and 40.30%, respectively in comparison to plain concrete. RP fiber showed a substantial increase in toughness and a slight decrease in flexural strength of concrete at a fiber volume fraction of 1.00% compared to PP fibers at fiber volume fraction of 0.50%. RP fibers caused a significant increase in compressive strengths up to 13.02% compared to concrete without fiber reinforcement.

Keywords : concrete, plastic, shrinkage cracking, compressive strength, flexural strength, toughness, RF recycled fibers, polypropylene PP fibers

Conference Title : ICACE 2015 : International Conference on Architecture and Civil Engineering

Conference Location : Venice, Italy

Conference Dates : April 13-14, 2015