

Recycled Plastic Fibers for Minimizing Plastic Shrinkage Cracking of Cement Based Mortar

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Abstract : The development of new construction materials using recycled plastic is important to both the construction and the plastic recycling industries. Manufacturing of fibers from industrial or post-consumer 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 ordinary cement based mortar. Parameters investigated include: Fiber length ranging from 20 to 50 mm, and fiber volume fraction ranging from 0% to 1.5% by volume. The test results showed significant improvement in crack arresting mechanism and substantial reduction in the surface area of cracks for the mortar reinforced with recycled plastic fibers compared to plain mortar. Furthermore, test results indicated that there was a slight decrease in compressive strength of mortar reinforced with different lengths and contents of recycled fibers compared to plain mortar. This study suggests that adding more than 1% of RP fibers to mortar, can be used effectively for controlling plastic shrinkage cracking of cement based mortar, and thus results in waste reduction and resources conservation.

Keywords : mortar, plastic, shrinkage cracking, compressive strength, RF recycled fibers

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