

Title: Strength, modulus of elasticity and shrinkage behaviour of concrete containing waste carpet fiber

Author/Authors: Abu S. M. Abdul Awal, Hossein Mohammadhosseini, Md. Zakaria Hossain

Abstract: This paper presents test results on some physical and mechanical properties of concrete containing fiber from recycled carpet waste. Five concrete mixes namely plain concrete (PC) i.e. concrete without carpet fiber, as control and carpet fiber reinforced concrete (CFRC) mixes containing 0.5%, 1.0%, 1.5% and 2.0% polypropylene (PP) waste carpet fibers were made and tested for compressive, tensile and flexural strengths, modulus of elasticity and shrinkage at curing periods of 1, 7 and 28 days. It has been found that the addition of carpet fiber reduced the workability and density of concrete. Concrete containing carpet fiber exhibited lower compressive strength and modulus of elasticity than plain concrete. The carpet fibers, however, effectively improved the splitting tensile and flexural strengths of concrete. The obtained values of shrinkage revealed that the shrinkage strain of carpet fiber reinforced concrete was higher than that of plain concrete. On the basis of short-term investigation, the one-year shrinkage values of both plain concrete and concrete containing carpet fiber were also predicted by extrapolating the data obtained during this period. The results obtained in this study indicate that waste carpet fiber can suitably be used as fiber reinforcement in concrete with satisfactory performance.