

# Mechanical Properties and Flexural Behavior of reinforced Polymer The Effects of Adding Waste Plastic Fibers (WPFs) on Some Properties of Self Compacting Concrete using Iraqi local Materials

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This study presents an experimental research of Self-Compacting Concrete (SCC) properties containing waste plastic fibers (WPF). Adding waste plastics which resulting from cutting PET bottles as fibers to SCC with aspect ratio ( $l/d$ ) equal to (28). To illustrate the effects of WPFs on the SCC, the current study was divided into two parts, the first part shows the effect of adding plastic fibers on the properties of fresh SCC, which include the ability flow, spread, passing and resistance to segregation, and the second part to evaluate the properties of hardened (mechanical) destructive and non-destructive, which include compression strength, flexural strength and ultrasonic pulse velocity test.

One reference concrete mix was conducted and eight mixes contain WPF has been producing self-compacting concrete mixers containing a different volumetric ratio of plastic fibers ( $V_f$ )% percentages (0.25, 0.5, 0.75, 1, 1.25, 1.5, 1.75, 2) %. Three cubes samples were prepared for testing the compressive strength, three prisms were prepared for the test modules of rupture, one cylinder were prepared testing the modulus of elasticity.

The experiments show that adding plastic fibers to SCC leads to an increase in the compression strength and modulus of rupture at 28-day as follows (42.30)% and (73.12)% respectively for mix ratio (1.5)% in comparison with the reference mix, which represent the best ratio of fibers, as such the results of testing the fresh concrete containing waste fibers showed that adding these fibers led a reduction in workability for SCC.