

Use of Non-Woven Polyethylene Terephthalate (PET) Tissue to improve Certain Properties of Concrete

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Abstract - Nowadays plastic is closely linked to the way of our life. The annual consumption of plastics has been increasing gradually. The inadequate disposal of plastic has been resulted in major environmental problems due to the shortage of space for landfilling and low biodegradability. The reuse of plastic wastes as construction materials provides a remarkable future market for waste recycling. This work aims to study the possibility of Evolon ® plastic non-woven sheets in concrete mixtures. For this purpose, an experimental study was conducted to investigate some properties of the ordinary concrete wrapped by non-woven PET plastic sheets. Samples with five various configurations; reference, 1-layer, 2-sides, 3-sides, and full wrapped were considered and prepared. The compressive, flexural, and split tensile strengths and ultrasonic pulse velocity (UPV) were measured. The outcomes of the study highlight that the compressive strength was improved for the wrapped samples, particularly for the cylindrical specimens. In addition, split tensile and flexural strengths of the wrapped samples improved significantly compared to the reference ones at each strengthened configuration. Moreover, it was observed that reference samples were damaged to many parts after mechanical testing, while wrapped specimens were taken by the applied configurations and were not separated into many small fragments. Therefore, non-woven fabrics are recommended to improve certain properties of the concrete.

Keyword: Evolon ® Non-woven sheets, Mechanical behaviors, Crack pattern, Ultrasonic pulse velocity