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A STUDY ON MECHANICAL PROPERTIES OF POLYMER CONCRETE CONTAINING ELECTRONIC PLASTIC WASTE

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ABSTRACT

It is aimed to research the effects of electronic plastic waste (e-plastic) on the mechanical properties of polymer concrete. E-plastic was used as a part of the filling materials (quartz sand and gravel) to obtain polymer concrete in this study. Unsaturated polyester resin material has been chosen as the polymer material and used as binder in polymer concrete production. Resin/filling material ratio has been determined as 10%-90%, 15%-85% and 20%-80%, e-plastic/filling material ratio has been decided to be 0%, 5%, 15% and 25%. 28-day of axial compressive, flexural and splitting tensile strength values of the test samples were evaluated. The increase in the ratio of resin, increases the compressive strength while it does not cause a dramatic increase or decrease in the flexural and splitting tensile strength. Compressive, flexural and splitting tensile strength values decrease as the ratio of e-plastic increases. On the other hand, electronic plastic waste increases the polymer concrete's ductility. Experimental study shows that ideal resin ratio and ideal e-plastic ratio values are 15% and 5%, respectively.

Keywords: Electronic plastic waste (e-plastic); Unsaturated polyester resin; Polymer concrete; Compressive strength; Flexural strength; Splitting tensile strength

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