

Influence of Recycled Polymer-Based Aggregates on Mechanical Properties of Polymer Concrete

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Abstract : Our natural resources are diminishing day by day with the needs of the growing world population. There is a danger that these resources will be depleted if they are not used in a controlled manner. As a result of the rapid increase in the consumption of limited natural resources, one of the issues where studies have gained importance is recycling. Many countries have carried out various research and development activities on recycling and reuse to prevent wastage of resources. For sustainable and healthy living, the limited amount of raw material resources in nature should be consumed consciously, and the necessary awareness should be given for recycling activities. One of the sectors where the consumption of raw materials is high is the construction sector. With the changing consumption habits of the evolving technology in the construction sector, the need to use special concrete along with the normal concrete has arisen. With the increasing need for specialty concretes, polymer concrete, which was discovered in the early 1900s, has evolved to the present day. Polymer concretes are special concretes with high strength, water impermeability, resistance to chemical action, and low surface roughness. Thanks to these properties, they find wide applications in many fields such as swimming pools, drainage systems, repair works. In the study, the effect of using recycled aggregates instead of natural aggregates in the production of polymer concrete on the performance of polymer concrete is investigated. In the experiments conducted for this purpose, the use of natural aggregate is reduced at certain rates, and instead, recycled aggregate is added at the same rate. The recycled aggregate to be used in the study is obtained from the polymer concrete drainage channel production facility of Mert Casting Co., Istanbul, Turkey. In order to clearly observe the effect of recycled materials on the product in the study, the other components (resin, hardener, accelerator, and additive) are kept constant in the concrete mix. In the study, fresh and hardened concrete tests are to be carried out on the mixes to be prepared.

Keywords : concrete, mechanical properties, polymer concrete, recycle aggregate

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