

## **Mechanical Properties of High Performance Concrete Containing Waste Plastic as Aggregate**

**Abdulkader Ismail Al-Hadithi, Mahmood Fawzi Alani**

### **Abstract**

The world's population growth and the increasing demand for new infrastructure facilities and buildings, present us with the vision of a higher resources consumption, specially in the form of more durable concrete such as High Performance Concrete (HPC). Moreover, the growth of the world pollution by plastic waste has been tremendous. The aim of this research is to investigate the change in mechanical properties of HPC with added waste plastics in concrete. For this purpose 2.5%, 5% and 7.5% in volume of natural fine aggregate in the HPC mixes were replaced by an equal volume of Polyethylene Terephthalate (PET) waste, got by shredded PET bottles. The mechanical properties (compressive, splitting tensile, and flexural strength) evaluated at the ages of (7, 28, 56 and 91) days while the static modulus of elasticity tested at (28 and 91) days. The results indicated that HPC containing PET-aggregate presented lower compressive strength and static elasticity. The splitting strength displayed an arising trend at the initial stages, however, they have a tendency to decrease after a while. On the other hand, flexural strength results gave better modulus of rupture at all ages of curing, as compared with reference concrete specimens.

### **Keywords**

high performance concrete; waste plastic aggregate.

<https://www.iasj.net/iasj?func=fulltext&ald=104747>