

# Lightweight Concrete Made from Waste Polystyrene and Fly Ash

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**Abstract:** Concretes containing Portland cement, fly ash as the supplementary cementitious material, natural fine aggregate and a novel lightweight material called Stabilised Polystyrene (SPS) aggregate were investigated. This paper presents the results of an experimental work on the effects of waste Expanded Polystyrene (EPS) based light weight aggregate called Stabilised Polystyrene (SPS) and fly ash in concrete. The composite aggregate was formed with 70% waste polystyrene which was shredded to coarse and sand sizes, 10% of a natural material to improve the resistance to segregation of EPS and 20% Portland cement. Nine different mixtures with water to binder ratio (W/B) of 0.8 with varying SPS content ratios of 0, 60 and 100% as partial replacement of natural fine aggregate by equivalent volume at the fly ash replacement levels of 0, 20 and 40% with Portland cement were prepared and tested. The properties of concrete investigated in this paper were compressive strength and ultrasonic pulse velocity (UPV) at the age of 28-day. The results indicate that there is a decrease in compressive strength and UPV with increasing amounts of SPS and fly ash in concrete.