

# Development and Characterization of High Value Products from Two Major Environmental Pollutants: Fly ash and Waste Tire Rubber

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**Abstract**—Fly ash is a residue generated during the combustion of pulverized coal in thermal power plants and is considered as major environmental pollutant. The annual production of fly ash in India has already reached to 184 Million Tons in 2015 and this figure will continuously increase with the increasing demand of electricity. On the other hand, waste tire rubber is also produced in large quantities as the vehicle numbers in India are increasing at a very fast pace. It is found that annually, about a Million Ton of waste tire rubber is available in India. Therefore, the figures are alarming and it has become highly essential to develop technologies for bulk utilization of these solid wastes. Fly ash has many properties like high silica content, particle size, morphology and surface characteristics that make it a suitable material to be used as low cost filler in polymer composites. Whereas, crumb rubber is produced by reprocessing of waste tire rubber contains high percentage of carbon black. Due to which it acts as a reinforcing agent and thereby enhance the strength of the composites. In present work evaluates the feasibility of utilizing high percentage of fly ash and crumb rubber to develop a fly ash/crumb rubber reinforced styrene butadiene rubber composite. The concentration of fly ash was kept constant and crumb rubber concentration was varied from 40 phr -240 phr. Results showed that with increase in crumb rubber loading tensile strength, tear strength, abrasion resistance and skid resistance of the composites increased whereas water absorption, compression set and hardness decreased. Experimental observation reveals that the composites exhibit the characteristic properties of pavement tile. It can further be used for different applications like door mats, Yoga mats, kindergarten playground tiles, athlete running tracks etc.

**Keywords:** Fly ash, crumb rubber, pollutant, mechanical properties.