

Mechanical Behaviour of Bio-Degradable Polymer Composites from Waste Paper Powder Filled Epoxy Composites as Sustainable Insulation Material in Construction

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ABSTRACT

Sustainable materials gaining popularity almost in all fields of application due to the concern on the environment and polymer composites is one among them. The reinforcement of filler is the novel technique to enhance the mechanical properties of polymers. This work pertaining to the mechanical behaviour of micron range coir filler reinforced epoxy matrix composites. The epoxy composites are fabricated using hand lay-up technique. For the development of composites, we used waste paper micro-fillers as reinforcement which are uniformly dispersed in the epoxy matrix. The following mechanical testing performed to assess the mechanical properties of the micro-composites and neat polymer: tensile test, flexural test, and hardness test. The maximum mechanical properties were noted when the filler concentration was maximum. Dynamic Light Scattering (DLS) particle size analysis shown the size distribution of waste paper micro-particles and the avg. size of micro-particles was 0.27 μm .

Keywords: *Micro-composites, Dynamic Light Scattering, Mechanical tests, waste filler, recycling.*