

Synthesis and Analysis of Eco-Friendly Materials - Banana Fibre and Fly Ash Reinforced Composite

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Abstract: *This research paper presents an experimental study on the fabrication and testing of Banana Fibre/Fly Ash Reinforced Composites. The goal of this study was to explore the mechanical properties and potential applications of these composites in various industries. The fabrication process involved preparing six specimen samples with different compositions of banana fibre and fly ash, following the ASTM D3039/D3039M standard dimensions for tensile testing. The specimens were manufactured using epoxy resin and hardener, with proper vacuum casting to eliminate air bubbles and ensure uniformity. Tensile tests were conducted using a Universal Testing Machine (UTM) according to the ASTM D638 standard. The results indicated that the composite with 6% banana fibre and 10% fly ash exhibited the highest tensile strength of 45.80 MPa. Comparison with other materials/composites revealed that the tensile strength of the Banana Fibre/Fly Ash Reinforced Composite surpassed that of various commonly used materials. The study identified potential applications for these composites in building materials, automotive components, packaging, furniture, textiles, and agricultural/horticultural fields. The research findings highlight the advantages of these composites, including their lightweight, strength, durability, and eco-friendliness. Overall, the study provides valuable insights into the fabrication, mechanical properties, and potential applications of Banana Fibre/Fly Ash Reinforced Composites, making them a promising alternative in diverse industries.*

Keywords: Banana Fibre, Fly ash, Composite materials, Tensile testing, Mechanical Properties, Sustainable materials, Potential applications

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