

# **Fabrication and Evolution of Mechanical Properties of - Epoxy Resin Reinforced with Jute Fiber and Wood Dust by Open Mould Technique**

**Kushala V B<sup>1</sup>, Pooja A M<sup>2</sup>, Shoaib Khan<sup>3</sup>, Hemanth D R<sup>4</sup>,**

**Mr. Mahanthesh G<sup>5</sup>, Dr. B. M Viswanatha<sup>6</sup>**

**B.E. Scholars, Department of Mechanical Engineering<sup>1-4</sup>**

**Professor, Department of Mechanical Engineering<sup>5,6</sup>**

**Kalpataru Institute of Technology, Tiptur, India**

**Abstract:** The increasing demand for lightweight, cost-effective, and environmentally friendly materials has led to the development of natural fiber reinforced polymer composites. In this study, a composite material reinforced with jute fiber and wood dust as filler was fabricated using the open mould technique. Epoxy resin was used as the matrix material along with a suitable hardener. The objective of this work is to evaluate the mechanical properties of the developed composite and analyze the effect of wood dust addition on its performance. Standard test specimens were prepared and subjected to tensile, flexural, and impact tests as per ASTM standards. The experimental results showed that the inclusion of wood dust improved the interfacial bonding between the fiber and matrix, leading to enhanced mechanical strength. The composite exhibited good stiffness, adequate strength, and low weight, making it suitable for structural and semi-structural applications. The study highlights the potential of using natural fibers and waste materials like wood dust in composite fabrication, contributing to sustainable material development and waste utilization. These eco-friendly composites can serve as an alternative to synthetic fiber composites in various engineering applications.

**Keywords:** Natural fiber composites; Jute fiber; Wood dust; Epoxy resin; Mechanical properties; Open mould technique