

VISVESVARAYA TECHNOLOGICAL UNIVERSITY.

Santi Bastiwad Road, Machhe, Belgaum- 590014, KARNATAKA



Project Report On

Effect of Surface Treatment on the Mechanical Properties of Natural Fiber Reinforced/Epoxy Hybrid Bio-Composites

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Submitted By

AMIT KUMAR CHAUBEY

(1SS07ME004)

ANKAJ KUMAR JHA

(1SS06ME006)

MANOJ KUMAR GOGOI

(1SS06ME027)

SANJEEV KUMAR

(1SS07ME045)

Under the guidance of

Mr. GIRISHA.C

ME, Lecturer

Dept. of Mechanical Engg.

S.S.I.T, TUMKUR



**DEPARTMENT OF MECHANICAL ENGINEERING
SRI SIDDHARTHA INSTITUTE OF TECHNOLOGY**

(An Autonomous Institution under the ambit of Visvesvaraya Technological University, Belgaum-590014)

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ABSTRACT

There is a growing interest in the use of natural fibers as reinforcing components for both thermoplastic and thermo set matrices, because of the ideal benefits offered by natural fibers such as convenient renewability, biodegradability, and environmentally friendliness.

Biocomposites which have natural fibers as reinforcements have increasingly attracted attention because they may be a promising material not only as a novel material for natural resource, eco-friendliness, sustainability, lightness, carbon dioxide reduction in nature and cost-effectiveness, but also as an alternative to conventional glass fiber polymer composites in many industrial and commodity applications.

Conventional and traditional fiber reinforced composite materials are composed of carbon fibers, glass fibers which are incorporated into Polymers, these composite materials have excellent mechanical properties but these materials cause environmental pollution due to the non degradability of fibers. The uses of natural fibers as reinforcement has grown substantially in the past decade as they have low density and high specific strength, and are of utmost interest in applications striving for lightweight and high strength.

The aim of this work is to explore the possibility of improving the effective mechanical properties of a thermo set matrix reinforced with natural fibers enhancing the fiber–matrix interphase interactions.

The methodology adopted is as below.

- i) Extraction of natural fibers i.e. natural fibers such as Coconut coir, Sisal, Ridge guard, Aracnut and Bamboo are extracted by retting and mechanical extraction.
- ii) Surface treatment of the natural fibers to improve the matrix adhesion properties and also to remove the moisture content.
- iii) Preparation of the Hybrid Composite Materials using Epoxy resin as the matrix and natural fibers as the reinforcement with weight fractions ranging from 0% to 30 %.
- iv) Testing the composite materials for the evaluation of Mechanical Properties (Tensile Testing)
- v) Analysis of the results and finding out the influence of the surface treatment on the Mechanical properties of the Composite Materials.