

A
Project Report
On
**Tensile Strength and Failure Analysis of Natural (Jute) and Glass
Fibre Composite With circular Drill Using Scanning Electron
Microscopy For Failure Mechanism.**



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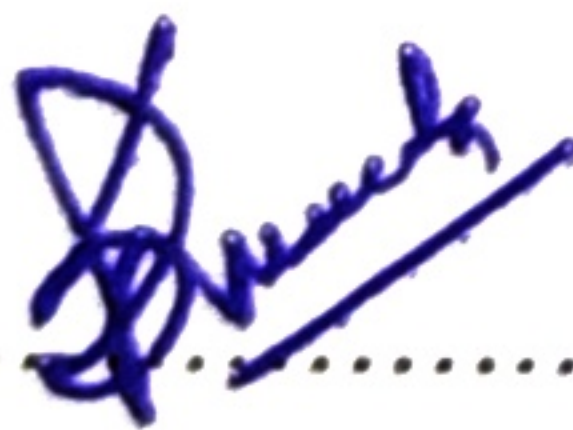
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Tensile Strength and Failure Analysis of Natural (Jute) and Glass Fibre Composite With circular Drill Using Scanning Electron Microscopy For Failure Mechanism.

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ABSTRACT

In this experiment, Comparative study of tensile strength is done on hybrid composite laminates having jute and glass with and without circular hole on transverse loading. Moreover, the failure mechanism is observed with a Scanning Electron Microscope. The hand-layup method is used to fabricate the samples of dimensions 160mm*160mm with different stacking sequences.

Four layers (JJJJ,JGGJ,GJJG,GGGG) are fabricated under uniform pressure and room temperature. Use of rollers are done to avoid air gaps and resin pockets. Bi-directional Jute and unidirectional glass fibres are used for the experiment. L-12 EPOXY and K-6 HARDENER are used in a 10:1 ratio. The specimen of dimension 150mm*36mm*3.2 mm is taken with and without a circular hole for testing.

The hole diameter is kept 6 mm as mentioned in the ASTM standard having hole to width ratio as 1:6. After the tensile test of the specimen on transverse loading , the laminates having hole have lesser tensile strength than without hole . This is due to stress concentration on the circumference of the hole due to sudden area change. It is also seen that laminates having synthetic fibres as core have higher tensile strength than on face. JGGJ has 17.25% higher tensile strength than GJJG.

For the failure mechanism, a Scanning Electron Microscope is used for the microscopic view. The edges of the circular hole are observed under it. Fibre pullout , matrix failure , Crack propagation are the phenomena which are observed.

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