

**FINITE ELEMENT ANALYSIS AND EXPERIMENTAL
STUDIES OF BANANA BRISTLE COIR HYBRID
COMPOSITE**

of

**MASTER OF TECHNOLOGY
(Machine Design)**

Submitted

By

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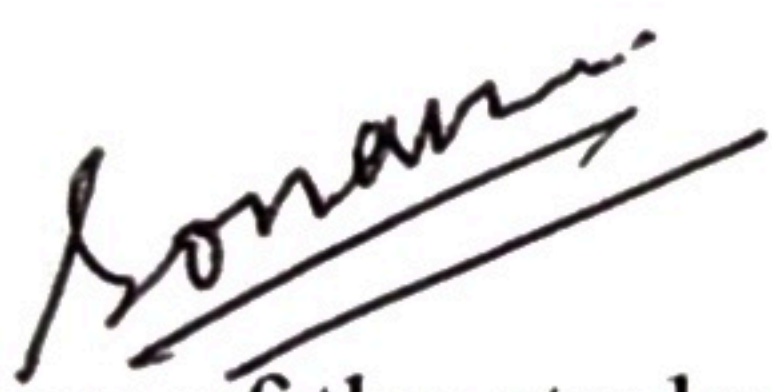
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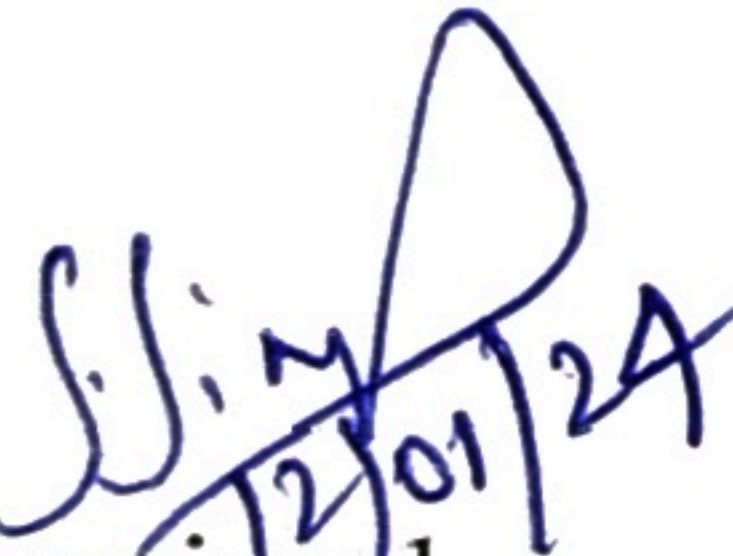
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This is to certify that the "Dissertation-Interim Evaluation" entitled "Finite Element Analysis and Experimental Studies of Banana Bristle Coir Hybrid Composite"


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Examiner 1
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ABSTRACT

This research report is related with design and development of Banana and Bristol Coir natural hybrid composite. The natural hybrid composite plays an important role to design light weight with good strength smart composite. A lot of research is going on to design smart material now a days, but the design of smart material is still needs to be improved in order to have light weight, fire proof and smart material. The natural hybrid composite materials consisting of Banana and Bristol Coir fibres are easily available in the environment which have a good mechanical property to design a composite material with light weight and accommodable strength. The Banana and Bristol coir composite has a wide range of potential applications due to its unique combination of properties, making it an attractive material for various industries seeking sustainable and durable alternatives to traditional materials such as aerospace and automotive industries, textile and agriculture industries, packages, building materials etc.

In this research work, a hybrid layered natural composite using banana and Bristol coir is fabricated using hand layup technique and analysed the mechanical properties using numerical analysis, Finite Element Analysis (FEM) and experimental analysis. In the first part the numerical analysis carried out to obtained the mechanical properties of the proposed hybrid natural composite using PYTHON 3.2 and after getting the results on the basis of ASTM standard the tensile and flexural strength results obtained by FEM analysis using ANSYS software Finally, the experimental tests are conducted of fabricated three samples *i.e.*, banana-coir-banana, coir-banana-coir and banana-banana-coir natural composite to verify the mechanical strength. The tensile, flexural, water absorption and flammability test are performed and obtained the experimental results. The results obtained from numerical analysis are compared with the results obtained from experimental test, shows that the deviation of both results is between 4 to 5%, in all three fabricated laminates. The results obtained from theoretical, numerical and experimental analysis having very good agreement and shows the effectiveness of the proposed research carried out in this thesis.

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