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Flexural properties of jute/kenaf/glass fibre reinforced nano-composite

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Aims and scope

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Abstract

The main objective of this study is to thoroughly investigate, model, and optimize different factors to develop a material that is suitable for use in automobile structures. The composite is created using the hand lay-up technique, and analysis is conducted using the Central Composite Design (CCD) method. A study was conducted using Response Surface Methodology (RSM) to develop mathematical models that can predict the flexural strength of materials. The study specifically looked at factors like fiber orientation, fiber sequence, and filler percentage, and how these factors affect the flexural properties of the materials. The findings from these models help in identifying the most advantageous variables to optimise flexural strength. The study reveals that the inclusion of Nano-fillers results in a notable improvement of 23% in flexural strength. Introducing TiO_2-infused polymers brings a fresh perspective, providing remarkable durability and

adaptability, which could be utilized in various sectors such as aerospace, automotive, indoor, and medical industries.

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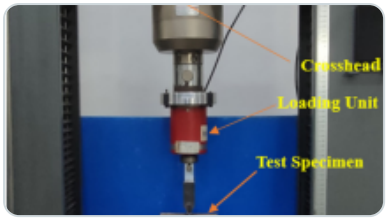

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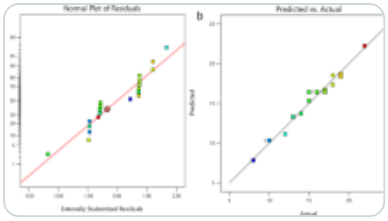

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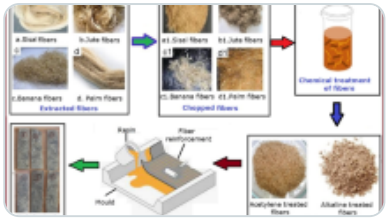

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Data availability

No datasets were generated or analysed during the current study.

Code availability

Not applicable.

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Contributions

T.S and R.S. contributed to the design and implementation of the research, to the analysis of the results and to the writing of the manuscript.

S.J.A. and A.P. wrote the paper with input from all authors.

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Ethics declarations

Ethics approval

Not applicable.

Consent to participate

Not applicable.

Consent to publication

Not applicable.

Competing interests

The authors declare no competing interests.

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