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Title :

Comparative analysis of the mechanical characteristics of hybrid composites made from pineapple and Kevlar fibres.

Introduction

Composites : A material which is produced from two or more constituent materials

Types of Composites

Polymer Matrix Composites
Carbon Matrix Composites
Metal Matrix Composites
Ceramic Matrix Composites

Polymer Matrix Composites :

Pmc are materials made from a polymer matrix that holds together a reinforcing material, such as fibers.

Objectives :

• The aim is to address this gap by exploring the use of pineapple leaf waste in hybrid laminates and evaluating its effectiveness for many applications..

• The objective of this proposed research work is to conduct flexural, impact, tensile, visual inspections, and NDT tests to investigate the mechanical properties..

SI.No	Title of the paper	Year	Author name	Abstract & Conclusion
1.	Mechanical properties of PALF/Kevlar –Reinforced unsaturated Polyester Hybrid Composite Laminates	2022	Siti Nadia Mohd Bakhori ,Mohamed zaki Hassan,	The PALF/Kevlar hybrid composites were fabricated by using hand layup method & KPK had the highest tensile strength and modulus. The SEM scans revealed that the hybrid composite had greater interfacial adhesion between the fibers and matrix than pure PALF composite.
2.	Potentiality of Utilizing woven Pineapple Leaf fiber for Polymer Composites	2022	Agung Efriyo,Januar parlaungan,Mohd bakeri	Pineapple leaf fiber is one of the natural fibers with the highest tensile strength and cellulose content. The findings showed that the 3 layers woven PALF performed better in terms of tensile and flexural properties than the other layers.
3.	Mechanical and dynamic performance of stainless steel and nylon mesh reinforced hybrid Kevlar /glass fiber composites.	2025	G.Rajamurugan, R.Elayaraja,Amod paba	The composite with the greatest impact energy absorption was C3(Glass/Nylon/Kevlar/SS 304/Glass) The results demonstrate the promise of mesh –reinforced Kevlar-glass hybrid composites for structural uses requiring extreme heat resistance, toughness and strength.
4.	An Update on Pineapple Leaf Fibers.	2025	Shiyu Liao,Jianming Chen	The over 70 pineapple varieties are typically divided into four categories Queen, smooth Cayenne, Honey Gold & Spanish pineapple. Comprehensive review of pineapple leaf fiber (PALF) extraction, processing and application, with emphasis on research advancement in the past 5 years.

Summary of Literature

•Pineapple has a lower cost, good thermal and acoustic insulation, excellent tensile strength, and high toughness.

•The 3 layers of PALF have the highest tensile and flexural properties compared to other layering materials, while the maximum layering content of woven PALF at 4 layers has the lowest tensile and flexural properties..

• The research involves an in-depth experimental investigation into the mechanical and dynamic properties of hybrid composites that have been strengthened with E-glass, Kevlar fibers, and nylon mesh.

Research Proposal

•Hybrid composites with PALF as reinforcement can be a new scope of research where combining the advantages of PALF with different synthetic or natural materials can improve properties.

•Polymer reinforcement materials such as pineapple, Kevlar 49, and Kevlar 29 are used.

Methodology

Hand layup Method process composites material

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Identify the reinforcement materials

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Investigation the mechanical properties

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Compare the Hybrid composites

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Result and Discussion

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Conclusion

References

1. Siti Nadia Mohd Bakhori ,Mohamed zaki Hassan, Mechanical properties of PALF/Kevlar –Reinforced unsaturated Polyester Hybrid Composite Laminates ,MDIP,2022,pages -1 to 17.

2. Agung Efriyo,Januar parlaungan,Mohd bakeri, Potentiality of Utilizing woven Pineapple Leaf fiber for Polymer Composites,MDIP,2022,pages-1 to 13.

3. G Rajamurugan ,R Elayaraja ,AmodPaba , Samarjeet Singh, Vinayak Vir Singh, Mechanical and dynamic performance of stainless steel and nylon mesh reinforced hybrid Kevlar /glass fiber composites,2025,IOP Publishing, pages- 1 to 12.

4. Shiyu Liao, Jianming Chen & Xungai Wang, An Update on Pineapple Leaf Fibers,2025,Taylor & Francis,pages- 1 to 47.