



**MECHANICAL PROPERTIES OF EPOXY  
REINFORCED WITH LAMINATED HEMP JUTE/  
HYBRID e-GLASS GFRP (GLASS FIBER  
REINFORCED POLYMER) COMPOSITE**

A Project report submitted  
In the partial fulfillment of the requirements for award of Degree of

**BACHELOR OF TECHNOLOGY  
IN  
MECHANICAL ENGINEERING**

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**CERTIFICATE**

This is to certify that the thesis entitled “**MECHANICAL PROPERTIES OF EPOXY REINFORCED WITH LAMINATED HEMP JUTE/ HYBRID e-GLASS GFRP (GLASS FIBER REINFORCED POLYMER) COMPOSITE**” being submitted by

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in partial fulfillment of the requirement for the award of the degree of BACHELOR OF TECHNOLOGY in MECHANICAL ENGINEERING is a record of bonafide work done by him under my supervision during the academic year 2019-2020.

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## ABSTRACT

The composite manufacturing has been a wide area of research and it is the preferred choice due to its superior properties like low density, stiffness, light weight and possesses better mechanical properties. This has found its wide applications in aerospace, automotive, marine and sporting industries. There has been continuous lookout for synthesizing composites without compromising on the mechanical and physical properties.

We are having two types of fibers natural fiber and synthetic fibre. The hybrid composites has emerged and have the potential reinforcement material for composites and thus it gained attraction by many researchers. This is mainly due to their applicable benefits have they offer low density, low cost, renewable, biodegradability and environmentally harmless & eco friendly and also comparable mechanical properties with synthetic fiber composites.

The main objective of present work is to investigate the mechanical properties of jute and Hybrid e-glass laminated reinforced composite at different fiber orientations. Six test specimens were prepared for each by varying fiber orientations and filler materials viz, Plain woven bi-directional Hemp jute, Plain woven Hybrid E-glass (one side e-glass and other side chopped standard reinforcement), Hemp jute and Hybrid e-glass, Hemp-jute and Hybrid e-glass with 5% cu filler, Hemp-jute and Hybrid e-glass with 5% Al filler, Hemp-jute and Hybrid e-glass with 5% graphite filler the following GFRP composites were fabricated according to the standards using hand layup method. The developed composite were then tested to evaluate their tensile, bending, impact and hardness properties. The best GFRP has to be concluded by comparing the results obtained in above cases.

**Key words:** Jute fibre, Hybrid-E-glass fibre, Epoxy resin, Mechanical properties, Hand layup method.