

IEEE 2017-18 Composite Based projects**1) IMPACT PROPERTIES OF ALUMINIUM - GLASS FIBER REINFORCED**

Aluminium - glass fiber reinforced plastics (GFRP) sandwich panels are hybrid laminates consisting of GFRP bonded with thin aluminum sheets on either side. Such sandwich materials are increasingly used in airplane and automobile structures. Laminates with varying aluminium thickness fractions, fiber volume fractions and orientation in the layers of GFRP were fabricated by hand lay up method and evaluated for their impact performance by conducting drop weight tests under low velocity impacts. The impact energy required for initiating a crack in the outer aluminium layer as well as the energy required for perforation was recorded. The impact load-time history was also recorded to understand the failure behavior. The damage depth and the damage area were measured to evaluate the impact resistance. Optical photography and scanning electron micrographs were taken to visualize the crack and the damage zone. The bidirectional cross-ply hybrid laminate (CPHL) has been found to exhibit better impact performance and damage resistance than the unidirectional hybrid laminate (UDHL). Increase in aluminium thickness fraction (A_{ltf}) and fiber volume fraction (V_f) resulted in an increase in the impact energy required for cracking and perforation. On an overall basis, the sandwich panels exhibited better impact performance than the monolithic aluminium.

2) MECHANICAL BEHAVIOUR COCONUT COIR FIBER REINFORCED WITH EPOXY POLYMER COMPOSITE

Now-a-days, the natural fibres from renewable natural resources offer the potential to act as a reinforcing material for polymer composites alternative to the use of glass, carbon and other man-made fibres. Among various fibres, jute is most widely used natural fibre due to its advantages like easy availability, low density, low production cost and satisfactory mechanical properties. For a composite material, its mechanical behaviour depends on many factors such as fibre content, orientation, types, length etc. Attempts have been made in this research work to study the effect of fibre loading and orientation on the physical and mechanical behaviour of jute/glass fibre reinforced epoxy based hybrid composites. A hybrid composite is a combination of two or more different types of fibre in which one type of fibre balance the deficiency of another fibre.

3) MECHANICAL BEHAVIOUR OF E-GLASS, , EPOXY REINFORCED WITH FILLER MATERIALS (RUBBER POWDER) COMPOSITE

Now-a-days, the natural fibres from renewable natural resources offer the potential to act as a reinforcing material for polymer composites alternative to the use of glass, carbon and other man-made fibres. A hybrid composite is a combination of two or more different types of fibre in which one type of fibre balance the deficiency of another fibre.

Composites of various compositions with three different fibre 0, 5, 10 , 15 percentages are fabricated

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using simple hand lay-up technique. It has been observed that there is a significant effect of fibre loading and percentage on the performance of composites. The developed composites undergo different kinds of tests. The result shows composites having good strength and stiffness compared to natural hybrid composites.

4) MECHANICAL BEHAVIOUR OF E-GLASS, EPOXY REINFORCED WITH FILLER MATERIALS (E - WASTE) COMPOSITE

Now-a-days, the natural fibres from renewable natural resources offer the potential to act as a reinforcing material for polymer composites alternative to the use of glass, carbon and other man-made fibres. Among various fibres, jute is most widely used natural fibre due to its advantages like easy availability, low density, low production cost and satisfactory mechanical properties. For a composite material, its mechanical behaviour depends on many factors such as fibre content, orientation, types, length etc. Attempts have been made in this research work to study the effect of fibre loading and percentage on the physical and mechanical behaviour of eglass fibre reinforced epoxy based composites. A hybrid composite is a combination of two or more different types of fibre in which one type of fibre balance the deficiency of another fibre.

Composites of various compositions with three different filler material orientation as 0 , 5 ,10, 15, percentage are fabricated using simple hand lay-up technique. It has been observed that there is a significant effect of fibre loading and orientation on the performance of eglass fibre reinforced epoxy based hybrid composites. The developed hybrid composites undergo different kinds of tests. The result shows hybrid composites having good strength and stiffness compared to natural hybrid composites.

5) MECHANICAL BEHAVIOR OF E – GLASS, JUTE EPOXY REINFORCED NATURAL HYBRID COMPOSITE

Now-a-days, the natural fibres from renewable natural resources offer the potential to act as a reinforcing material for polymer composites alternative to the use of glass, carbon and other man-made fibres. Among various fibres, jute is most widely used natural fibre due to its advantages like easy availability, low density, low production cost and satisfactory mechanical properties. For a composite material, its mechanical behaviour depends on many factors such as fibre content, orientation, types, length etc. Attempts have been made in this research work to study the effect of fibre loading and orientation on the physical and mechanical behaviour of jute/glass fibre reinforced epoxy based hybrid composites. A hybrid composite is a combination of two or more different types of fibre in which one type of fibre balance the deficiency of another fibre.

Composites of various compositions with three different fibre orientation (0° , 30° and 40°) are fabricated using simple hand lay-up technique. It has been observed that there is a significant effect of fibre loading and orientation on the performance of jute/glass fibre reinforced epoxy based hybrid composites. The developed hybrid composites undergo different kinds of tests. The result shows hybrid composites having good strength and stiffness compared to natural hybrid composites. The Finite Elemental Analysis was carried to determine the stress and compare the result with experimental data.

6) MECHANICAL BEHAVIOR OF E – GLASS, JUTE EPOXY REINFORCED NATURAL HYBRID COMPOSITE

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Composites of various compositions with three different fibre orientation (0° , 30° and 40°) are fabricated using simple hand lay-up technique. It has been observed that there is a significant effect of fibre loading and orientation on the performance of jute/glass fibre reinforced epoxy based hybrid composites. The developed hybrid composites undergo different kinds of tests. The result shows hybrid composites having good strength and stiffness compared to natural hybrid composites. The Finite Elemental Analysis was carried to determine the stress and compare the result with experimental data.

7) MECHANICAL BEHAVIOR OF SISAL , BAMBOO, EPOXY REINFORCED NATURAL COMPOSITE

Now-a-days, the natural fibres from renewable natural resources offer the potential to act as a reinforcing material for polymer composites alternative to the use of glass, carbon and other man-made fibres. Among various fibres, jute is most widely used natural fibre due to its advantages like easy availability, low density, low production cost and satisfactory mechanical properties. For a composite material, its mechanical behaviour depends on many factors such as fibre content, orientation, types, length etc. Attempts have been made in this research work to study the effect of fibre loading and orientation on the physical and mechanical behaviour of jute/glass fibre reinforced epoxy based hybrid composites. A hybrid composite is a combination of two or more different types of fibre in which one type of fibre balance the deficiency of another fibre.

Composites of various compositions with three different fibre orientation (0° , 30° and 40°) are fabricated using simple hand lay-up technique. It has been observed that there is a significant effect of fibre loading and orientation on the performance of sisal and bamboo reinforced epoxy based composites. The developed composites undergo different kinds of tests. The result shows hybrid composites having good strength and stiffness compared to natural hybrid composites

8) MECHANICAL CHARACTERIZATION OF GLASS FIBER ALUMINIUM REINFORCED RIVETED JOINTS

The airframe of any flying vehicle comprises structural members such as stringers and stiffeners made of sheet metal members, joined by riveted lap joints. Although different joining techniques exist, the rivet type of fastening still stands efficient. Numerous such rivets are required to join the skin completely. The mechanical loading due to the pressurization and depressurization of the fuselage, which occurs once in every flight and the air loads during the cruising flight causes the concentrated stress at the rivet joints which results in the failure of joints . The main objective of this research paper is to improve the strength of the riveted joints using Fiber Metal Laminate (FML) as the reinforcing material between the riveted joints. The tensile testing of the usage of the riveted joints. The Joint is

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combining two or more components for an application. Riveting is a method of joining two components in real world using the friction between them. Present-day, the rivet joints are most commonly used in automotive sector due to the efficient clam-up, less weight and resistance to corrosion. The rivet in the rivet joint fills the hole completely arresting the relative motion between the plates. Riveting is a process of joining two or more plates with the help of a rivet. A good amount of mechanical force is to be provided to make the strong and leak proof joint.

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