



# RECYCLING APPROACH OF WASTE TOWARDS DEVELOPMENT OF COMPOSITE MATERIALS

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## Material Preparation

The fiber material has been selected from the waste material which can be used as in advantageous application are human hair, coconut hair, dry grass and polyethene strands.

The very first material which I selected is human hair. The second material selected for fiber is coconut hair or coir. The coconut hair is used in the raw form to avoid the use of machines and equipments.

The coconut hair proved its load carrying capacity. The third material selected for fiber is Oyza sativa Dry grass with a aim to minimize the air pollution caused by its burning. The grass has also good characteristics as it is also used as tying material and collectively the grass strands have good tensile properties.

## Matrix Selection

The matrix is used to join the fibers together and give the required strength and solidify it as one component. The matrix used here is polyester resin.

Polyester resins are thermoset polyesters that are created by combining a glycol (like ethylene glycol) with an alcohol (like phthalic or maleic acid). Water is given off in what is known as a condensation reaction. The reason for which polyester resin is selected as matrix material is as follows:

- It is bio-degradable.
- Not expensive.
- Viscosity can be controlled.
- Used in open moulding
- Easy to mix.
- No machines and equipment required.

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### Method of Preparation

The fiber sample are prepared by using the polyester resin along with the hardeners and fiber material recovered from the waste like human hair, coconut hair, dry oryza sativa(rice plant) and polyethene strands. The basic elements for the fibre material composition is as follows.

1. Polyester resin
2. Hardeners (Cobalt and Catalus)
3. Fibre materials from waste

The proportions for the preparations for mixture of resin with hardeners is as follows

2 kg of polyester resin mixed with 30 grams of cobalt and 15 grams of catalus hardeners and the mixture is to stir with wooden stick for 2-3 minutes and used within 15 minutes for long lasting effects. To make the sheet sample first the boundaries is to be fixed with wooden frames to control the flow of the resin mixture. After preparing the wooden frames the fiber material is spread on the frame of the respective sizes after then the resin mixture is poured to the desired thickness. After 5-7 minutes the composite material is that much to solidifies to place from one place to other but it takes 10-12 hrs to solidify completely and to be used.

The images of the prepared material are as follows:



Coconut hair fiber sheet



oryza sativa fiber sheet



Polyethene strand fiber sheet



Human hair fiber sheet

### **Bibliography**

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