# Bio Degradable Composites for Aircraft Structures

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***Abstract:-*** **This study reveals about the development of bio-degradable composite using banana fiber for low strength applications and the production of low cost green composite. In this paper, the manufacturing of composite by using mainly banana fiber and epoxy resin. By considering the advantages of natural fiber such as recyclable, lightweight and low production cost and also readily available, it has been used in many applications such as automotive components, avionics industry, aerospace parts and other industry. This paper also mainly reviewed about the usage of agro waste composite materials which is economically safe and disposal material. The natural composite are mainly used in aircraft as interlines in the seats, panels etc.**

***Keywords: Green composite, banana fiber, fire resistant.***

## 1. INTRODUCTION

Natural fibers can be defined as bio base fibers or fibers from vegetable and animal origin. This includes all plant fiber, jute, The molding method used here is compression technique. They increasing the fitness test and moisture content, water soak test. And also mainly increased the mechanical property. coconut,pineapple and bagasse were technically and economically feasible . Cotton, hemp, flax, coir, and ramie etc. Agricultural waste is seen as one potential Source of renewable energy. The corn, husk has also been used for industry application. There is an increase of scientists and engineers who are dedicated to minimize the environmental impact of polymer composite production. Rice straw and bagasse fiber are used as writing papers and printing papers. The development of agricultural industry waste are intensifies for usingnon-convectional raw materials such as oil palm, coconut , pineapple and bagasse were technically and economically feasible. They can play an important supplementary role, especially in the form of files.

## 2. MANUFACTURING METHODS

There are many methods used in manufacturing in composite materials to find its material property. Some of the methods are commonly used such as: Extrusion, Injection molding and Compression molding.

Compression molding is a method of molding in which the molding material, generally pre heated is first placed in an open heated mold cavity. The mold is closed with a top face or plug member, pressure is applied to force the material into contact with all mold areas, while heat and pressure are maintained until the molding material has cured. The process employs thermosetting resins in a partially cured stage, either in the form of granules, putty-like masses, or preforms.

### INJECTION MOLDING

Injection molding is a manufacturing process for producing parts by injection molding, material into a mold. Injection molding can be performed with a host of materials mainly including metals, glasses, elastomers, confections and most commonly thermoplastic and thermosetting polymers. Injection molding is widely used for manufacturing a variety of part from the smallest components to entire body panels of cars.

### EXTRUSION MOLDING

Extrusion is a process used to create objects of a fixed cross sectional profile. Material is pushed through a die of the desired cross section. The main advantages of this process over other manufacturing process are its ability to create very complex cross section, and to work materials that are brittle and shear stresses. It also gives excellent surface finish. It also used in the aircraft components including seat tracks, panels etc.

### *3.1 BAMBOO FIBER/ PVA SOLUTION*

In this paper, bamboo [1] fiber is used because the material was cheaper and conventionally in reinforcements making structural components using the resin “PVA” and “CPR” respectively. In this work, the

preparation of the unidirectional green composites made from bamboo fiber and the two bio degradable resins was described. Bamboo fiber reinforced PVA and CPR composites were fabricated by press molding. This paper prove the increasing in the tensile strength of the material.

## AGRICULTURAL WASTE

The world is now focusing on bio degradable products by which green composite made of ecofriendly and bio degradable fibrous material have replaced the conventional materials like wood, metals etc. banana fiber, sugarcane, baggage, sisal and husk etc. [4] by choosing among the many polyvinyl alcohol grades available, it is possible to obtain the performance properties required for your specific applications properties such as water solubility, abrasion resistance, tensile strength, adhesive and bonding properties , grease or oil resistance and film forming qualities. The molding method used here is compression technique. They increasing the fitness test and moisture content, water soak test. And also mainly increased the mechanical property. The modulus of elasticity tests the specimen's ability to resist bending.

## SHORT AREA FIBER COMPOSITE

Plant such as area nut, flax, cotton,hemp, jute, sisal, pineapple, ramie, bamboo, banana etc. by using the resin such as polyester. The fibers are soaked in 5% aqueous solution of sodium hydroxide (NAOH) 72 to 76 hours. The treatment of fibers will increase the mechanical strength such as flexural strength, modulus and [5] impact strength of the composite by 40%. General molding method were used in this process. This composite materials can improve the adhesion properties between area fiber and matrix and reduce the water absorption.

## POLYLACTIC ACID (PLA)/ BANANA FIBER

In this study, by using the Polylactic acid (PLA) banana fiber composite were prepared by melt blending method. Following mechanical tests showed that the tensile and flexural strengths of the composites markedly increased with the fiber content to certain value. [2] The production cost is lower. The raw banana fiber obtained by a mechanical separation of the fiber from the stem was subjected to various surface chemical modifications.

## BANANA FIBER/ PP/ MAPP

The natural fiber reinforced polymer matrix composite (PMC) is one of the advanced technologies development in the materials engineering industry. The banana fiber is varied by three different configurations: banana fiber yarn, banana fiber mat, raw banana fiber. The bonding agent polypropylene [3] improve the natural fiber strength. The molding mechanism is compression molding technology. The banana fiber also increases the flexural strength and tensile strength and high yield strength. It is a best fiber configuration.

## 4. CONCLUSION

Green composites consisted of banana fiber and bio degradable resins were prepared by compression molding. It was found that, epoxy, banana fiber composites possessed the highest tensile strength and flexural strength increased. The polypropylene coating resist the fire and also increase the impact strength. Since manufacturing, processing, disposing of this composite will not create any hazard impact to the environment, that's why it known to be "bio degradable composite".

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