IN PRESENT STUDY OF MECHANICAL CHARACTERSTRICS ANALYSIS FOR NATURAL FIBER IN ARECA NUT COMPOSITES

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ABSTRCT

Natural Fibers composites are considering to have potential use as reinforcing material in polymer matrix composites because of their good strength, stiffness, low cost, environmental friendly and biodegradable. In present study, mechanical properties for natural fiber **Areca nut** composites were evaluate. Here, Areca fiber is using as new natural fiber reinforcement and epoxy resin as matrix. The extracting areca fibers from areca nut were chemically treatment considering next level are get better interfacial bonding between fiber and matrix. Composite were preparing with randomly orient fibers with different proportions of fibers and matrix ratio are survey from past literatures .In our research works focus Mechanical tests i.e. impact and hardness tests were performed and the results are reported. The results show that, as the fiber volume fraction and composite post curing time increases the mechanical properties of the composite increases evaluate i our main goal.

Keyword : areca nut, composite, mechanical characteristics , present study

1.INTRODUCTION

1.1 DEFINITION OF COMPOSITE

A composite is combination of two materials in which one of the materials, called the reinforcing phase, is in the form of Areca Nut fibers, sheets, or particles, and is embedded in the other materials called the matrix phase. The reinforcing material and the matrix material can be metal, ceramic, or polymer. Composites typically have an Areca Nut fiber or particle phase that is stiffer and stronger than the continuous matrix phase and serve as the principal load carrying members. The matrix acts as a load transfer medium between Areca Nut fibers, and in less ideal cases where the loads are complex, the matrix may even have to bear loads transverse to the Areca Nut fiber axis. The matrix is more ductile than the Areca Nut fibers and thus acts as a source of composite toughness. The matrix also serves to protect the Areca Nut fibers from environmental damage before, during and after composite processing. When designed properly, the new combined material exhibits better strength than would each individual material. Composites are used not only for their structural properties, but also for electrical, thermal, tribological, and environmental applications.

Jartiz [1] stated that "Composites are multifunctional material systems that provide characteristics not obtainable from any discrete material. They are cohesive structures made by physically combining two or more compatible materials, different in composition and characteristics and sometimes in form".

Kelly [2] very clearly stresses that the composites should not be regarded simple as a combination of two materials. In the broader significance; the combination has its own distinctive properties. In terms of strength to resistance to heat or some other desirable quality, it is better than either of the components alone or radically different from either of them.

Beghezan [3] defines as "The composites are compound materials which differ from alloys by the fact that the individual components retain their characteristics but are so incorporated into the composite as to take advantage only of their attributes and not of their short comings", in order to obtain improved materials.

Van Suchetclan [4] explains composite materials as heterogeneous materials consisting of two or more solid phases, which are in intimate contact with each other on a microscopic scale. They can be also considered as homogeneous materials on a microscopic scale in the sense that any portion of it will have the same physical property.

The following are some of the reasons why composites are selected for certain applications:

1.High strength to weight ratio (low density high tensile strength) .

2.High creep resistance.

3.High tensile strength at elevated temperatures.

4.High toughness .

1.2 CLASSIFICATION OF COMPOSITES

1.2.1 According to the type of reinforcing material composites can be classified as:

(1)Fibrous Composite:

An Areca Nut fibers characterized by its length being much greater compared to its cross-sectional dimensions. The dimensions of the reinforcement determine its capability of contributing its properties to the composite. Areca Nut fibers are very effective in improving the fracture resistance of the matrix since a reinforcement having a long dimension discourages the growth of incipient cracks normal to the reinforcement that might otherwise lead to failure, particularly with brittle matrices. Man-made filaments or Areca Nut fibers of non polymeric materials exhibit much higher strength along their length since large flaws, which may be present in the bulk material, are minimized because of the small cross-sectional dimensions of the Areca Nut fiber. In the case of polymeric materials, orientation of the molecular structure is responsible for high strength and stiffness.

(2)Particulate Composites:

In particulate composites the reinforcement is of particle nature. It may be spherical, cubic, tetragonal, a platelet, or of other regular or irregular shape. In general, particles are not very effective in improving fracture resistance but they enhance the stiffness of the composite to a limited extent. Particle fillers are widely used to improve the properties of matrix materials such as to modify the thermal and electrical conductivities, improve performance at elevated temperatures, reduce friction, increase wear and abrasion resistance, improve machinability, increase surface hardness and reduce shrinkage. 11

2**.2 According to type of matrix material they are classified as:**

1.Metal Matrix Composites (MMC)

2.Ceramic Matrix Composites (CMC)

3.Polymer Matrix Composites (PMC)

(1)Metal Matrix Composites:

Higher strength, fracture toughness and stiffness are offered by metal matrices. Metal matrix can withstand elevated temperature in corrosive environment than polymer composites. Titanium, aluminum and magnesium are the popular matrix metals currently in vogue, which are particularly useful for aircraft applications. Because of these attributes metal matrix composites are under consideration for wide range of applications viz. combustion chamber nozzle (in rocket, space shuttle), housings, tubing, cables, heat exchangers, structural members etc.

(2)Ceramic matrix Composites:

One of the main objectives in producing ceramic matrix composites is to increase the toughness. Naturally it is hoped and indeed often found that there is a concomitant improvement in strength and stiffness of ceramic matrix composites.

(3)Polymer Matrix Composites:

Most commonly used matrix materials are polymeric. In general the mechanical properties of polymers are inadequate for many structural purposes. In particular their strength and stiffness are low compared to metals and ceramics. These difficulties are overcome by reinforcing other materials with polymers. Secondly the processing of polymer matrix composites need not involve high pressure and doesn't require high temperature. Also equipments required for manufacturing polymer matrix composites are simpler. For this reason polymer matrix composites developed rapidly and soon became popular for structural applications. Two types of polymer composites are:

(a) Areca Nut fiber reinforced polymer (FRP)

(b) Particle reinforced polymer (PRP) 12

a)Areca Nut fiber Reinforced Polymer:

Common Areca Nut fiber reinforced composites are composed of Areca Nut fibers and a matrix. Erconut fibers is the reinforcement and the main source of strength while matrix glues all the Areca Nut fibers together in shape and transfers stresses between the reinforcing Areca Nut fibers. Sometimes, filler might be added to smooth the manufacturing process, impact special properties to the composites, and / or reduce the product cost.

(b)Particle Reinforced Polymer:

Particles used for reinforcing include ceramics and glasses such as small mineral particles, metal particles such as aluminum and amorphous materials, including polymers and carbon black. Particles are used to increase the modules of the matrix and to decrease the ductility of the matrix .

1.3 HYBRID COMPOSITE

Hybrid composites are more advanced composites as compared to conventional FRP composites. Hybrids can have more than one reinforcing phase and a single matrix phase or single reinforcing phase with multiple matrix phases or multiple reinforcing and multiple matrix phases. They have better flexibility as compared to other Areca Nut fiber reinforced composites. Normally it contains a high modulus Areca Nut fiber with low modulus Areca Nut fiber.The high-modulus Areca Nut fiber provides the stiffness and load bearing qualities, whereas the low-modulus Areca Nut fiber makes the composite more damage tolerant and keeps the material cost low. The mechanical properties of a hybrid composite can be varied by changing volume ratio and stacking sequence of different plies.

1.4 NATURAL ARECA NUT FIBER REINFORCED COMPOSITES

Figure 1.4 Erica nut Fiber -Natural Fiber

The interest in natural Areca Nut fiber-reinforced polymer composite materials is rapidly growing both in terms of their industrial applications and fundamental research. They are renewable, cheap, completely or partially recyclable, and biodegradable. Plants, such as flax, cotton, hemp, jute, sisal, kenaf, pineapple, ramie, bamboo, banana, etc., as well as wood, used from time immemorial as a source of lignocelluloses Areca Nut fibers, are more and more often applied as the reinforcement of composites. Their availability, renewability, low density, and price as well as satisfactory mechanical properties make them an attractive ecological alternative to glass, carbon and man-made Areca Nut fibers used for the manufacturing of composites. The natural Areca Nut fiber-
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2.LITERATURE REVIEW

A composite is a material made by combining two or more dissimilar materials in such a way that the resultant material is endowed with properties superior to any of its parental ones. Areca Nut fiber-reinforced composites, owing to their superior properties, are usually applied in different fields like defense, aerospace, engineering applications, sports goods, etc. Nowadays, natural Areca Nut fiber composites have gained increasing interest due to their eco-friendly properties. A lot of work has been done by researchers based on these natural Areca Nut fibers. Natural Areca Nut fibers such as jute, sisal, silk and coir are inexpensive, abundant and renewable, lightweight, with low density, high toughness, and biodegradable. Natural fibres such as jute have the potential to be used as a replacement for traditional reinforcement materials in composites for applications which requires high strength to weight ratio and further weight reduction. Bagasse Areca Nut fiber has lowest density so able to reduce the weight of the composite upto very less. So by using these Areca Nut fibers (jute, bagasse, and lantana camara) the composite developed is cost effective and perfect utilization of waste product.

Natural Areca Nut fiber reinforced polymer composites have raised great attentions and interests among materials scientists and engineers in recent years due to the considerations of developing an environmental friendly material and partly replacing currently used glass or carbon Areca Nut fibers in Areca Nut fiber reinforced composites. They are high specific strength and modulus materials, low prices, recyclable, easy available in some countries, etc.

Tobias, B.C [1] Its Fabrication and performance of natural fiber-reinforced composite materials. International SAMPE Symposium and Exhibition. 35(1): 970-978.

Short abaca fiber-reinforced composite materials were fabricated at room conditions using a combination of Araldite resin, Thiokol, and hardener. The tensile strength, tensile modulus, and impact strength were dependent on the fiber length and fiber volume fraction. Fiber length greater than critical length coupled with a strong interfacial bond between fiber and matrix yielded better tensile strength, whereas short fiber and weak interfacial bonding yielded better impact strength. Both tensile and impact strength increased as the fiber volume fraction increased to approximately 70 percent.

Tobias, B.C [2] in investigated Stress rupture behavior of natural fiber-reinforced composite materials. International SAMPE Symposium and Exhibition. 36(2): 1816-1822.

Composite lamina containing polysulfide rubber modified epoxy resin with short fiber volume fractions of 30 and 40 percent were used in the experimental investigation which was carried out to establish the influence of fiber volume fraction on the stress rupture life. An increase in the sustained constant stress reduced the life of the abaca fiber reinforced composite materials, but the rupture strength of the material increased significantly as the fiber volume fraction increased. The rate of degradation under sustained constant stress was higher in material with lower fiber volume fraction. Fabrication of the composite was by a conventional manual lay-up method.

Augustin, H [3]. its Annotated bibliography on the utilization of agricultural residues and non-wood fibrous material for the production of panels. United Nations Industrial Development Organization (UNIDO) Document ID/WG.83/16.95 p.

This report is an excellent review of publications on nonwood plant fiber materials used in panel board production. The review contains 444 references, including cross-references. Plant-fiber materials included are abaca, areca-nut, bagasse, bamboo, banana, cassava stalks, coffee

husks, coconut and coir, cornstalk and corncob, cotton stalk and cotton seed hulls, flax, groundnut shells, hemp, jute, kenaf, mustard stalk, papyrus, peanut shell, pineapple, poppy straw, ramie, rape straw, reed, rice husks and straw, palm, sisal, sorghum, straw, sunflower husks, and tobacco.

Narayanamurti, D [4].; Gupta, R.C.; Ratra, Y.S. Utilization of areca palm stems. Research and Industry. 7: 340-343.

The production of particleboard, fiberboard, and plastic board from areca palm stems was studied and reported.

Narayanamurti, D. [5]; Gupta, R.C.; Singh, J They Measurements of swelling pressure in wood-particle boards. Holz als Roh- und Werkstoff. 20(3): 89-90. [German].

Thermo dyne boards and thermally plasticized particleboards made from two tropical woods, areca-nut husk, and bamboo (*Bambusa polymorpha*) were examined with a Cope tensiorheometer. The results indicated that the measurement of the swelling pressure by this method gave a good criterion for evaluating the swelling resistance and dimensional stability of wood-based products.

Narayanamurti, D. [6] Fibre boards from Indian timbers. Indian Forester. 86(1): 5-15.

Hardboards and insulation boards with satisfactory properties can be produced from indigenous Indian raw material, namely, areca-nut husk, bagasse, bamboo, tapioca stems, and the wood and bark of various conifers and hardwoods. The properties of the boards obtained by the

Asplund process or by a mild chemical cook (0.5 to 1 percent NaOH at 100°C) are tabulated.

Narayanamurti, D [7] its Studies on building boards. Part I. Utilization of areca-nut husk waste. Forest Research Institute, Dehra Dun, Indian Forest Leaflet 112. 9 p.

Data are given on the chemical composition of areca-nut husks. Satisfactory building boards can be made by pulping the husks by the Asplund process or a hydrolytic treatment with dilute acid or alkali, and then pressing the pulp to boards in the usual manner.

Narayanamurti, D [8] its Studies on building boards. VII. Building boards from tannin-containing lignocellulosic materials. Composite Wood. 1(5): 121-124.

Building boards were prepared experimentally from indigenous tannin-containing waste, namely, areca-nut husk, spent tea leaves, and sal bark. Furfural and formaldehyde were added to the powdered material. Tea leaves yielded the poorest results. Areca-nut husk board had good strength only when high pressures were applied. Sal bark board had good strength, but the addition of sawdust further improved the strength.

Narayanamurti, D. [9] its Studies on building boards. VIII. Production of building boards from various woods and barks by defibration. Composite Wood. 2(1): 6-15.

Asplund pulps were prepared from indigenous Indian raw materials, such as areca-nut husk, bamboo shavings, tannin-extracted sal bark, and different wood species, and then wet pressed into insulating boards and hardboards. The effect of operating conditions on board properties was studied in detail. The outer portion of bamboo, containing waxes and resinous materials, gave products with higher moisture resistance and better strengths than the inner portion. Moisture absorption and swelling of boards made from areca-nut husk could be reduced by treating the pulp with alkali prior to forming into boards. Data on chemical composition of the pulps and the physical properties of the resulting boards are given in tables.

Bavappa, K.V.A.[10] its The many things they make from areca. Indian Farming. 10(10): 19, 40. wood-particle panels. Extensive production data are given. Boards were tested to DIN standards to give, for the nonfermented bagasse, 0.52 to 0.63 g/cm3 density, 12 to 20 mm thickness, 16.7 to 25.5 MPa bending strength, and 1.4 to 2.0 GPa modulus of elasticity compared with 0.52 to 0.63 g/cm3 density, 12 to 20 mm thickness, 11.8 to 13.7 MPa bending strength, and 1.0 to 1.2 GPa modulus of elasticity for the control (fermented bagasse).

Cherkasov[11].its Use of furfural-urea resin for production of particle board from bagasse. Sobre Derivados de la Cana de Azucar. 3(2): 13-17. [Spanish]. Urea-furfural resins were prepared, combined with bagasse, and cured in the presence of various acid catalysts to yield particleboard with excellent rupture modulus and low water absorption and thickness swelling. The physical properties of the boards were superior to those obtained by using urea-formaldehyde resin binder only.

Dalen, H. [12] Utilization of bagasse as raw material for particleboard production in the future. In: Proceedings of the TAPPI pulping conference; 1980 November 16-19; Atlanta, GA. Atlanta, GA: TAPPI Press: 307-309. This paper presents a general overview on the use of bagasse in the production of particleboard. A compact plant layout is shown and the ease of operation discussed. A comparison of costs for wood and bagasse fibers and how these influence the production costs is given.

Grozdits, [13] the Surface-activated wood bonding systems: accelerated aging of coated and uncoated composite boards. Holzforschung. 37(4): 167-172.

The performance of coated and uncoated flakeboard and fiberboard, made from HNO3-activated, lignin-bonded fir flakes and bagasse, respectively, and phenolic resin-bonded fir flakeboard during accelerated aging was evaluated in this study. H2O-based acrylic and latex primers showed equal, or slightly better, performance on flakeboard and fiberboard made from HNO3-activated, lignin-bonded fir flakes and bagasse, respectively, as compared to phenolic resin-bonded fir flakeboard. The slightly better performance of flakeboard and fiberboard made from HNO3-activated, lignin-bonded fir flakes and bagasse, respectively, during the early stages of weathering, after 80 and 160 h of exposure, was explained in part by the HNO3 treatment of the fir flakes and bagasse. After the 80 and 160 h of exposure, the coatings on flakeboard and
fiberboard made from HNO3-activated, lignin-bonded fir flakes and bagasse, respectively, were more effective in reducing swelling than those on phenolic resin-bonded fir flakeboard. However, after 1,024 h of exposure this difference diminished. The paint durability was best when 1 percent fines were incorporated into the boards to improve bonding and board texture.

Li *et al*. [14] conducted a research to study the mechanical properties, especially interfacial performances of the composites based on natural Areca Nut fibers due to the poor interfacial bonding between the hydrophilic natural Areca Nut fibers and the hydrophobic polymer matrices. Two types of Areca Nut fiber surface treatment methods, namely chemical bonding and oxidization were used to improve the interfacial bonding properties of natural Areca Nut fiber reinforced polymeric composites. Interfacial properties were evaluated and analyzed by single Areca Nut fiber pull-out test and the theoretical model. The interfacial shear strength (IFSS) was obtained by the statistical parameters. The results were compared with those obtained by traditional ways. Based on this study, an improved method which could more accurately evaluate the interfacial properties between natural Areca Nut fiber and polymeric matrices was proposed.

Joshi *et al.* [15] compared life cycle environmental performance of natural Areca Nut fiber composites with glass Areca Nut fiber reinforced composites and found that natural Areca Nut fiber composites are environmentally superior in the specific applications studied. Natural Areca Nut fiber composites are likely to be environmentally superior to glass Areca Nut fiber composites in most cases for the following reasons: (1) natural Areca Nut fiber production has lower environmental impacts compared to glass Areca Nut fiber production; (2) natural Areca Nut fiber composites have higher Areca Nut fiber content for equivalent performance, 16 reducing more polluting base polymer content; (3) the light-weight natural Areca Nut fiber composites improve fuel efficiency and reduce emissions in the use phase of the component, especially in auto applications; and (4) end of life incineration of natural Areca Nut fibers results in recovered energy and carbon credits.

Rana *et al*. [16] in their work showed that the use of compatibilizer in jute Areca Nut fibers increases its mechanical properties. At 60% by weight of Areca Nut fiber loading, the use of the compatibilizer improved the flexural strength as high as 100%, tensile strength to 120%, and impact strength by 175%. The following conclusions may be drawn from this paper:

1. The sharp increase in mechanical properties and decrease in water absorption values after addition of the compatibilizer.

2. All these results justify that the role of jute Areca Nut fiber was not as a filler Areca Nut fiber but as a reinforcing Areca Nut fiber in a properly compatibilized system.

3. This system produced a new range of low-energy, low-cost composites having interesting properties and should be given priority over costly and high-energy synthesis reinforcing Areca Nut fiber wherever possible.

Shah and Lakkad [17] tries to compare the mechanical properties of jute-reinforces and glass-reinforced and the results shows that the jute Areca Nut fibers, when introduced into the resin matrix as reinforcement, considerably improve the mechanical properties, but the improvement is much lower than that obtained by introduction of glass and other high performance Areca Nut fibers. Hence, the jute Areca Nut fibers can be used as reinforcement where modest strength and modulus are required.

Another potential use for the jute Areca Nut fibers is that, it can be used as a „filler" Areca Nut fiber, replacing the glass as well as the resin in a filament wound component.

The main problem of the present work has been that it is difficult to introduce a large quantity of jute Areca Nut fibers into the JRP laminates because the jute Areca Nut fibers, unlike glass Areca Nut fibers, soak up large amount of resin. This problem is partly overcome when „hybrid sing" with glass Areca Nut fibers is carried out.

Ray *et al.* [18] in their work, Jute fibres were subjected to alkali treatment with 5% NaOH solution for 0, 2, 4, 6 and 8 h at 300C. It was found that improvement in properties both for fibres and reinforced composites. The fibres after treatment were finer, having less hemicellulose content, increased crystallinity, reduced amount of defects resulting in superior bonding with the vinylester resin. As fibres, the improvements in properties were predominant around 6–8 h treatment whereas as composites, it was maximum when reinforced with 4 h-treated fibres at 35% fibre loadings. 17 The modulus of the jute fibres improved by 12, 68 and 79% after 4, 6 and 8 h of treatment, respectively. The tenacity of the fibres improved by 46% after 6 and 8 h treatment and the% breaking strain was reduced by 23% after 8 h treatment. For 35% composites with 4 h-treated fibres, the flexural strength improved from 199.1 to 238.9 MPa by 20%, modulus improved from 11.89 to 14.69 GPA by 23% and laminar shear strength increased from 0.238 to 0.283 MPa by 19%. On plotting different values of slopes obtained from the rates of improvement of flexural strength and modulus, against NaOH treatment time, two different failure modes were apparent before and after 4 h of NaOH treatment.

Saha *et al.* [19] in their paper, jute Areca Nut fibers were treated with alkali (NAOH) solution and physic-chemical properties of jute Areca Nut fibers was investigated. The treatments were applied under ambient and elevated temperatures and high pressure steaming conditions. The results indicated that the uniaxial tensile strength increased by up to 65% for alkali-steam treatment. The treatments without steaming were not as effective. Physico-chemical characterization of Areca Nut fibers showed that the increase in tensile strength was due to the removal of non-cellulosic matters like lignin, pectin and hemicellulose.

Gassan and Bledzki [20] used the coupling methods to improve the properties of composites. Composites have high level of moisture absorption, poor wettability, and insufficient adhesion between untreated Areca Nut fibers and the polymer matrix leads to debonding with age. To improve the properties of the composites, the natural reinforcing Areca Nut fibers can be modified coupling methods. The coupling agents have chemical groups which can react with Areca Nut fiber or polymer and thus improve the interfacial adhesion.

This paper concerns with the use of MAH-PP copolymers as coupling agents in jute-propylene composites. It is found that the flexural strength was increased by 40% and flexural modulus by 90%. SEM investigation showed the improved Areca Nut fiber-matrix adhesion which was due to the chemical bonds between Areca Nut fiber and matrix provided by the coupling agent.

Monteiro SN. Rodriquez *et al*. [21] tries to use the sugar cane bagasse waste as reinforcement to polymeric resins for fabrication of low cost composites. They reported that composites with homogeneous microstructures could be fabricated and mechanical properties similar to wooden agglomerates can be achieved.

Hassan *et al.* [21] have converted the bagasse into a thermo formable material through esterification of the Areca Nut fiber matrix. The dimensional stability and mechanical properties of the composites prepared from the esterified Areca Nut fibers were reported in this work. 18 **BC Ray** [15] used 3-point flexural test to qualitatively assess such effects for 55, 60 and 65 weight percentages of E-glass Areca Nut fibers reinforced epoxy composites during cryogenic and after thawing conditions. The specimens were tested at a range of 0.5 mm/min to 500 mm/min crosshead speed to evaluate the sensitivity of mechanical response during loading at ambient and sub-ambient (- 80°C temperature). These shear strength values are compared with the testing data of as-cured samples.

3.PROBLEM IDENTIFICATION

Based on above literature, the present work is formulated in order to evaluate the tensile, flexural and moisture properties of natural composites without fiber reinforcement and results were compared with the fiber reinforcement composites. The experiment work is carried out as follows:

1.Selecting the material

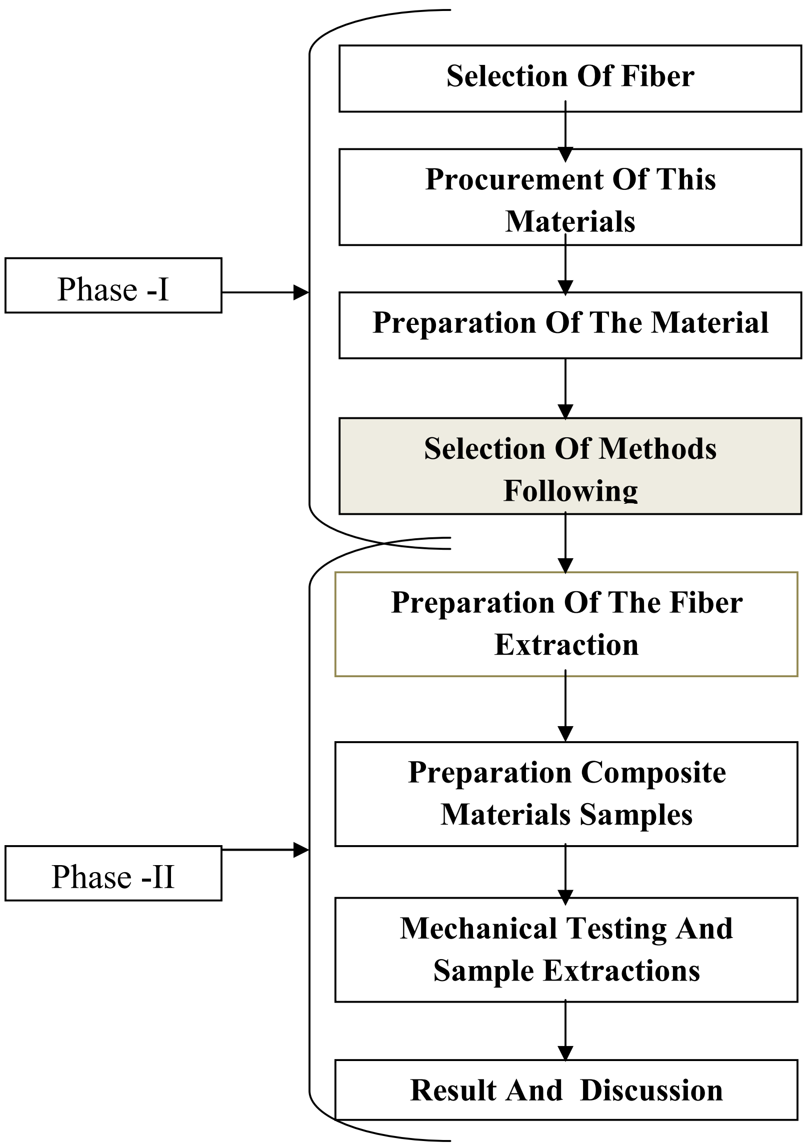
Fiber; areca Filler material: maize powder filler Matrix; epoxy resin (Lapox L12) Hardener; K6

2.Preparation of natural composite specimen (as per ASTM standards) for different weight fractions using Hand lay-up method and cured at room temperature.

DATA COLLECTION

The different weight fractions of epoxy resin, filler and fiber for composites are 90(epoxy resin): 10(filler) and 80:20 for composites without fiber additions and 90(epoxy resin): 5(filler): 5(fiber) and 80(epoxy resin):10(filler):10(fiber) for composite with fiber addition, as per the weight fractions the specimens are prepared in batches and tested in room temperature

METHODOLOGY



5.PREPARATION METHODS AND TESTING

The following section will elaborate in detail the experimental procedure carried out during the course of our project work. The steps involved are:

Specimen Fabrication (Fabrication of FRP).

1.By Hand Lay-Up method.

2.Cutting of Laminates into samples of desired dimensions.

5.1 Processing Of chemical Testing:

It is a method of determining the general classification of fiber materials. It normally entails taking a piece of metal, usually scrap, and applying it to a destructing in order to observe the sparks emitted. These sparks can be compared to a chart or to SITARC from a known test sample to determine the classification. Spark testing also can be used to sort ferrous materials, establishing the difference from one another by noting whether the spark is the same or different. Spark testing is used because it is quick, easy, and inexpensive. Moreover, test samples do not have to be prepared in any way, so, often, a piece of scrap is used. The main disadvantage to spark testing is its inability to identify a material positively; if positive identification is required, chemical analysis must be used. The spark comparison method also damages the material being tested, at least slightly.

5.1.1 Processing OF Compressed Air Method:

Another less common method for creating sparks is heating up the sample to red heat and then applying compressed air to the sample. The compressed air supplies enough oxygen to ignite the sample and give off sparks. This method is more accurate than using a grinder because it will always give off sparks of the same length for the same sample. The compressed air applies in essence the same "pressure" each time. This makes observations of the spark length a much more reliable characteristic for comparison.

5.3.2 TESTING OF TESNSILE TEST:

The tensile strength of a material is the maximum amount of tensile stress that it can take before failure. The commonly used specimen for tensile test is the dog-bone type. During the test a uniaxial load is applied through both the ends of the specimen. The dimension of specimen is (150x10x5)mm. Typical points of interest when testing a material include: ultimate tensile strength (UTS) or peak stress; offset yield strength (OYS) which represents a point just beyond the onset of permanent deformation; and the rupture (R) or fracture point where the specimen separates into pieces. The tensile test is performed in the universal testing machine (UTM) Instron 1195 and results are analyzed to calculate the tensile strength of composite samples.

FIG (5.1) UTM machine Sample unloaded condition for tensile testing

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FIG (5.2) UTM machine Sample loaded condition for tensile testing.

7.CONCLUSION AND FUTURE SCOPE

The Areca Nut fiber material constrained in this work indicate that it is possible to enhance the split and descried fibers- material to apply the bonding structure. The properties of fiber-reinforced composites through Areca Nut fiber surface modification in different kinds of process handling procedure with alkaline composite basis with raw material considering it.

Future scope :

In this future work to be considering bleached contact fiber composition to be done in manufacturing .Composites based on the modified fiber surface have, in general, superior mechanical properties to composites containing unmodified fibers and this, results in improved adhesion. Hence, in our project its alkaline based on bonding structure its better then other structure of formation based on the availability, low cost and good strength of areca fiber composites investigated in the present study, these composites can certainly be considered as a very promising material for the fabrication of lightweight materials used in automobile body production, office furniture, packaging industry, partition panels, etc. compared to conventional wood based plywood or particleboards to be finalized bonding and tensile properties to calculated in out project.

In this causes in to be finalized bonding structured in different composites applying in application at the next level .

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