

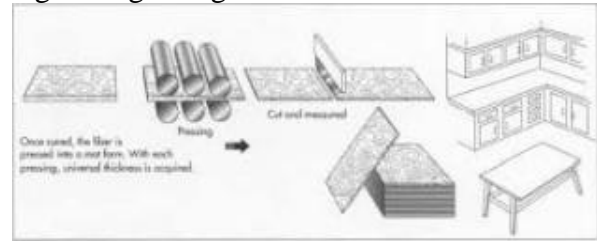
# Experimental Investigation of Mechanical Properties for Bagasse Natural Composite Material

Ravi Munje<sup>1</sup> Ashok H<sup>2</sup> Anand C M<sup>3</sup>

<sup>1,2,3</sup>Department of Mechanical Engineering  
<sup>1,2,3</sup>Maratha Mandal Engineering College Belgaum

**Abstract**—As we know that day today innovative creations is happening in the field of each and every where majorly in the field of materials. In early days generally people used to have iron and other materials to have an final creative products without knowing its weight and life of it but as the days are going the creations are coming up frequently now instead of regular materials they are trying to put natural materials with the consideration of composite materials. As we know composite is nothing but an creation of two constituents that to an chemical ingredients which are reinforcing material which is embedded into an matrix body with sufficient volume. So now if we consider a natural one which will be known as natural composite such as, Bagasse, jute, feathers, wood stacks and so on then the matter will be a single reinforcing material and a matrix body as resin with this we can implement natural composite in place of regular composites with all its properties.

**Key words:** Bagasse Natural Composite Material, Bagasse Fiber



From the heap of an sugarcane the stalks of it is pressed under an heavy rollers, so that it will be of small sheets of different layers again another stalk is taken and this is performed in such a way as this process is carried for all stalks and finally all the layers of stalks is pressed under high load of rollers and a sheet of bagasse natural composite is formed .this sheet is used for fabrication of metal sheet replaced with bagasse composites.

## B. Formation of Bagasse Natural Composite



Initially the sugarcane is crushed then the stalks of it is used as reinforcing material and resin is used as matrix material which is together formed as bagasse natural composite or bagasse fiber.

## I. INTRODUCTION

As we are concern with natural composite material in that bagasse as an natural composite then we have to go with the extraction of bagasse. As the sugarcane is carried in an sugarcane factory as the juice is extracted from the bunch of individual sugar cane in such a way a huge ton of sugar cane is shifted to an factory so as the process is carried out a hump of extracted sugar cane stalks will be formed near the extraction chamber this stalks is carried in an open area and will be dumped for a long time in an high temperature of heat with caring of due formation on it.so as the hip of stalks is soaked completely then it is crushed in an crusher machine where the stalks will be break up into an small small pieces which is carried for the preparation of reinforcing material and resin will be acting as an matrix material. So as the bagasse is naturally available with its stiffness and mechanical properties it is carried under natural bagasse composite material. To consider it as an best of natural composite several experiments has been done in order to achieve its name this all has been discussed below.



Fig. 1: Bagasse

### A. Extraction of Bagasse Composite

As we have discussed in introductory part that how the bagasse is extracted. So in this will have an complete procedure of extraction.

## II. RESULTS AND DISCUSSION

### A. Tensile test

In this above test dog bone type specimen is selected of 150\*10\*5mm to which a uniaxial load is applied under UTM. Three different type of stresses will formed i.e,  $\sigma_x$ ,  $\sigma_y$ ,  $\sigma_z$  where  $\sigma_z$  is very small which can be neglected therefore the fracture occurs at the ultimate point of the material.

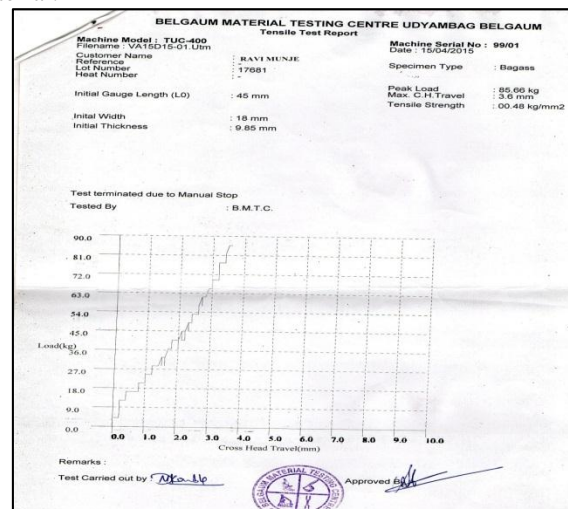


Fig. 1: Result of tensile test

### B. Compression Test

In this test a bagasse cubical slab is taken which is placed under UTM a compressive load is applied due to which  $\sigma_x$ ,  $\sigma_y$ ,  $\sigma_z$  stresses are induced in which  $\sigma_z$  is so small which is neglected. As the load is increased periodically the stresses induced is more and the deformation happens till the ultimate point.

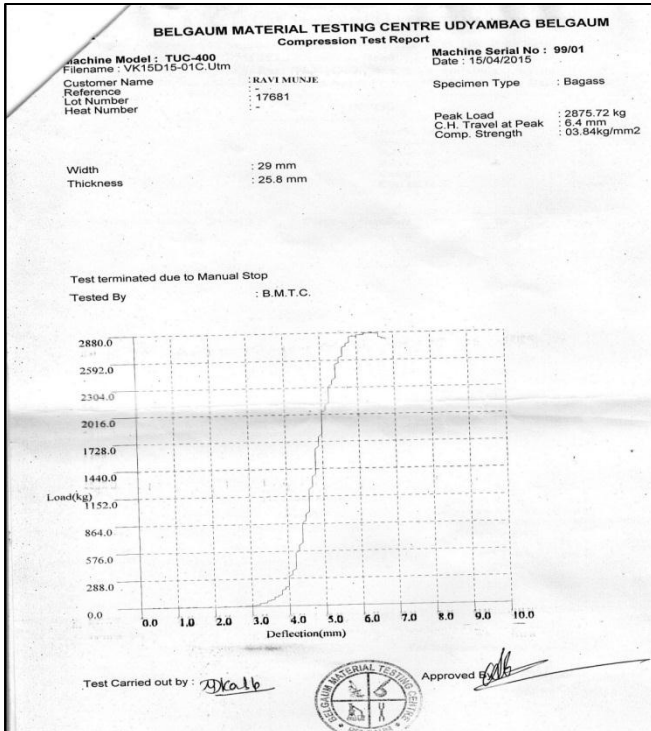


Fig. 2: Result of compression test

### C. Energy Absorption Test

From this test we can conclude that how much energy is absorbed by the composite material. absorption is done using two tests i.e, izod and charpy test where in charpy test material is placed horizontally and in izod test material is placed vertically. if the material breaks up it shows that how much energy is absorbed by the material. so if higher the energy absorption high is the material strength.

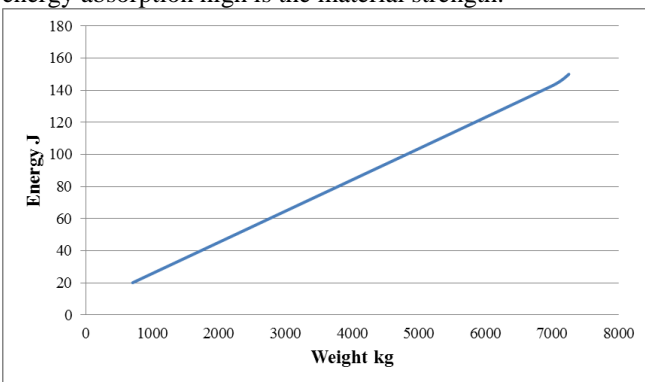


Fig. 3: Result for IZOD and Charpy test

### D. Wear Test

As we are familiar with the wear resistance property here the wear property is tested under wear testing machine. a cylindrical section of diameter 10mm is tested.

So if the diameter is more the wear property for that material is reduced and if the diameter is small then it will be easily breakdown with in the small limit.

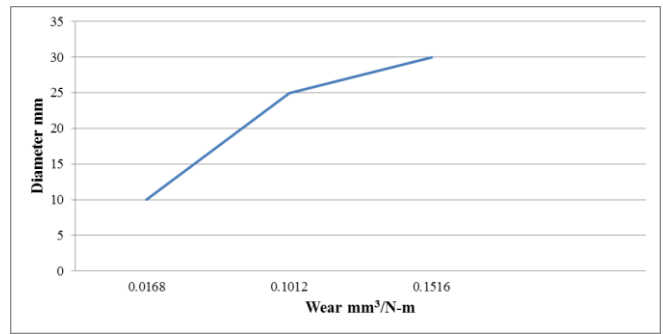


Fig. 4: Result for Diameter and Wear

### III. CONCLUSION

Finally we can conclude that bagasse composite material can be used as regular composite material with reference to all above mechanical properties and testing conducted. The applications of this composite material has been renewed in an automobile industry and material industry for some different applications. Bagasse composite has been placed in an maruti Suzuki automobile company as an chassis body cover. So as the materials are going in deep the usage of it has been done tremendously.

### REFERENCES

- [1] www.composite material.com
- [2] Composite manufacturing by Sanjay M
- [3] Bagasse fiber by verma
- [4] Theory of elasticity
- [5] Theory of plasticity