

# ANALYSIS OF BIODEGRADABLE 3D PRINTING MATERIAL BY NATURAL FIBRE REINFORCEMENT

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**Abstract—** The bio compatible organic polymers are nowadays become a number one contender for the plastic manifolds. Owing to its excellent load accepting and withstanding nature, capability to less retardation to temperatures and good strength: weight ratio made them the first choice to go for selection along with its eco-friendly nature. Even though possessing several impacts the boundaries have been fixed which have less strength and high cost. The proceeding work will investigate the pre and post nature of the bio composites when binded with a natural filler as an additive. With keeping the ASTM standards in mind, the mechanical properties have been analyzed and the impact is noted. The study suggests that the mechanical property on adding the natural fibre slightly increased initially but reduces on further addition.

**Keywords—** Biodegradable, Polylactic Acid, Sansevieria.

## I. INTRODUCTION

### 3D Printing Technology

3D printing an exact contrast of subtractive manufacturing process which develops the desired objects by adding the materials one over the other which reduces the scrap generation. Thus, creates a new opening for the dreamers and innovators to develop their own world in 3-dimensional modeling.

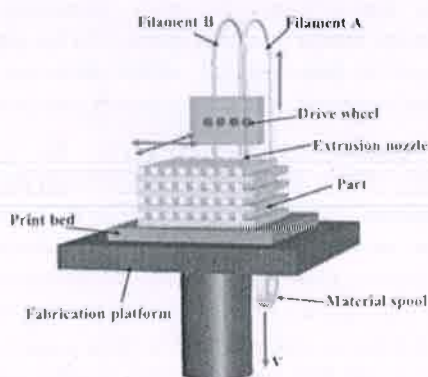


Fig 1. 3D printer

To make this dream come true in the manufacturing stream it is a need of an hour to find a suitable material which satisfies all the overwhelming requirements of the manufactures. Some proven Thermoplastic materials like acrylonitrile buta- diene styrene (ABS), polylactic acid (PLA), poly- amide (PA) and polycarbonate (PC) as well as thermosetting polymer materials like epoxy resins are well suited materials for 3D printing.

The perfect suitability of material will open gates for the 3D printing technology to find its applications in various streams. The love towards these materials is due to its very light weight and accessibility to make very intricate shapes. This property made this material to make its foot print in aero applications, Constructional sectors, Art craft industries, Tissue Engineering and Organ implantations etc.

Even though possessing various attractions the 3D printing technology is tied within certain boundaries due to its weak strength and lack of load bearing nature. That makes this technology to sit in the dugout as a prototype model.

The above-mentioned problems will be addressed by binding the low strength 3D printing materials with suitable binders which enhances the geometrical and load bearing nature whose performance will not be matched by any individual component.

Encapsulation of small materials, fibers or Nano fillers along with the polymers will give birth to PMC's which have a greater mechanical and functional behavior.

The impact created by 3D printing over the past have grabbed attention of various researchers. Mostly all the researcher has their concentration on 3d printing fabrication methods and pure polymer materials. Here the focus is on the combined study of both the composites and 3D printing technology which is growing up like a demand of situation in recent years.

## II. LITERATURE ANALYSIS

The fighting nature of Sansevieria roxburghiana against bacteria and other pathogens with exhibit zero negative effects which in turn make way for the development of a new medicines. This responsive nature of this plant ensures the fighting capability against the microbes which enhances the material life against the microorganisms.