

# Solid Waste Segregation

[<sup>1</sup>] Arun Kumar.M.R , [<sup>2</sup>] Ajay Karaddi , [<sup>3</sup>] Komal Kumar.K.R, [<sup>4</sup>] Anil, [<sup>5</sup>] Altaf Surapur  
 [1][2][3][4][5] Department of mechanical Engineering, Sri Sairam College of Engineering, Bengaluru, Karnataka.

**Abstract:**-- Plastic is one of the daily increasing useful as well as a hazardous material. At the time of need plastic is found to be very useful, but after its use, its simply thrown away, creating all kinds of hazards. Plastic is not bio degradable, so it will continue to be hazardous for more than centuries. The idea of this project is to find a use for this waste plastic scrap into something beautiful. The mixing of plastic with sand to create a new type of brick was put into thought. Since it is uneconomical to approach a local brick manufacturer for lending the machine, we designed and fabricated a brick manufacturing machine in the nearby engineering workshop. The machine was designed so as to fulfill our need for manufacturing brick in small quantity. The plastic scrap used was leftover pieces of bottles, cans etc. So, as a trial the plastic was chopped into small pieces and heat was supplied from below. After thorough mixing, the paste was poured into a rectangular mould with standard brick dimension. Local brick testing methods were conducted such as free fall of the brick and scratch test. In both of those tests, our brick showed increased strength. The brick was subjected to compressive test, water absorption test. The result showed that the plastic composite brick was efficient then the clay brick and cement brick

**Key Words:** solid waste segregation, ball bearing, rotating shaft, blades, chain, dc motor, battery.

## 1. INTRODUCTION

Solid waste is the unwanted and useless solid materials generated from combined residential and commercial activities in a given area. Solid waste consists of organic materials, glass, metals, plastic, papers etc. The major issue in our hand is separation of organic and plastic materials. Management of solid waste reduces or eliminates adverse impact on the environment and human health and supports economic and development and improved quality of life. According to our research we have studied that most of the waste produced in an urban area which are collected by the municipal corporation is either dump or burnt which is hazardous to the environment. Urban waste mainly consists of green waste and plastic, glass and metal can be easily separated. But the major problem is to separate plastic and green waste. There is no project yet installed to separate green and plastic waste. Previously used methods for separation include

- 1) Incineration of waste (Burning of waste in the presence of oxygen which results in the production of toxic gases).
- 2) Open burning (It is the burning of unwanted waste in a manner that cause smoke and other emission to be released directly into the air without passing through a chimney or stack).
- 3) Dumps and landfills (waste is dumped in land which produces harmful gases over long period).

## 2. OBJECTIVES OF THE PROJECT

- To study the municipal solid waste collection activities.

- To understand the various kinds of MSW disposal methods such as land filling, incineration and organic MSW composites.
- To enrich the resources which are being depleted due to rising population & increasing consumption rates.
- To reduce the quantity of toxic and hazardous chemicals and materials acquired used or disposed. To design waste separation mechanism.

## 3. METHODOLOGY OF THE PROJECT

- Solid waste is collected from the municipal corporation.
- The collected waste is passed through the rotating perforated drum (cylinder), where the mud and clay sand is separated from the waste & is collected in the tray.
- In second cycle again the waste is rotated in the drum then the low density plastic come above the green waste which is blown out from the drum using blower.

## 4. SPECIFICATIONS OF THE DYNAMO

### DC MOTOR WITH GEARED:

- 100RPM speed 12v DC motors with gearbox
- 3000RPM base motor
- 6mm shaft diameter with internal hole
- 125gm weight

- 1.2kgcm torque
- No-load current=60 mA(max),
- Load current=300 Ma(max)



**Fig 1: Dc motor with Gear**

**BATTERY**  
OUTPUT 12 VOLT  
CURRENT 18 AH



**Fig 2: Battery**

**5. TERMINOLOGY OF SOLID WASTE SEGREGATION**

**Land filling:** The environmental impacts of land filling the waste are largely dependent upon the land fill design, daily operation and the kind of solid waste being disposed. The major concerns of land filling are the impacts due to the landfill gas (LFG) and the leach ate generated.

**Waste Incineration:** The combustion of MSW under controlled conditions, aims to reduce the volume of the waste generated and thereby providing significant savings in transport costs and land filling. It destroys the organic, putrescible fraction of the waste, thus eliminating the possibility of landfill gas and leachate generation.

**Composting:** The biological decomposition and stabilization of organic fraction of the solid wastes under conditions that

encourage thermophilic temperatures, as a result of the biochemical reactions is known as composting. The product, compost, produced is reused to accomplish several purposes like reclaiming the nutritive value of the soil by providing nitrogen, phosphorus and other important trace elements, to provide necessary soil structure, moisture holding capacity and organic matter to the soil. The major environmental impacts due to the composting of solid waste are majorly, deteriorating water and air quality apart from a potential threat to public health as it attracts vectors and rodents.

**Recycling:** Recycling is defined by Murkowski (1992) as the using materials, which are at the end of their useful lives; for feeding stocks in the manufacturing of new products. Recycling differs from re-use because it involves processing; it differs from resource recovery, since in resource recovery, materials are recovered for reuse from a mixed stream of solid waste.

**6. CONCLUSION**

Thus the solid waste consist of green and plastic waste is separated by using sws machine and by-products are utilized successfully human ways of life placed pressure on the environment and have caused imbalance in the co system by the producing, consuming and wasting of natural resources. most countries evidently have major effects on the environment due to SW generation with economic development since the natural resource are used, and waste and pollution are produced. Therefore, the concern towards the management of solid waste as an integral part for sustainable development has increased.



**Fig 3: final fabricated model**

### **7. ADANTAGES**

- The process effectively separates bio degradable and non- biodegradable waste.
- Reduces carbon footprint on the environment.
- Separated products are easier to process and recycle.
- All the by-products can be processed and sold separately

### **8. SCOPE FOR FUTURE WORK**

- To educate people about reduce, reuse and recycle.
- Enhance modern technologies for recycling & composting of waste.
- Implement integrated solid waste management in ways that are protective to human health & the environment.
- To build a plant for effective separation of solid waste

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