

Manufacturing of Sheet Making Machine From Waste Pet Bottle Caps

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Abstract- Every single second, 1,000 people open a bottle of water in India. Each day, people in the India throw away more than 60 million plastic water bottles, most of which end up in landfills and waterways. Indians throw away 35 billion empty water bottles a year. Of those, only 12 percent are recycled. Out of everything we put in our recycle bins at home, approximately 50 percent of it is never recycled. For this reason the need of recycling arises. , We know that plastic is useful and also harmful for the environment and in the surrounding area. To avoid more pollution of plastics, plastic recycling is very important for our environment. The main purpose of our project is to reuse of plastic bottle caps and to recycle the plastics. This project discovers one of the options for recycling of plastic waste. In future multiple options are needed to save our environment from plastic pollutions.

Keywords- Plastic Bottle Cap, Waste management, Sheet Preparation

I. INTRODUCTION

Recycling, recovery and reprocessing of waste materials for use in new products. The basic phases in recycling are the collection of waste materials, their processing or manufacture into new products, and the purchase of those products, which may then themselves be recycled.

Plastic is a material consisting of any of a wide range of synthetic or semi-synthetic organic compounds that are malleable and therefore can be moulded into solid objects. Plasticity is the general property of all materials that involves permanent deformation without breaking. Polymers' name is derived from their flexible and plastic. Plastics are typically organic polymers of high molecular mass, but they often contain other substances. They are usually synthetic and most commonly derived from petrochemicals. However, today's focus on the environment has led to a growing number of plastics to be derived from renewable materials such as polylactic acid Plastics have been adopted in a significant, and ever-expanding, range of products thanks to their relatively low cost, ease of manufacture, versatility, and imperviousness

to water. They can be found in products as simple as paperclips or as complex.

For clarity purposes, this documentation is focused on a set of representative the plastic recycling also helps in reducing the uses and standard plastics, or engineering plastics. There are many different plastics, so we need ways of making sense of them all by grouping similar ones together. Plastic are suitable because they are disposable, however, disposable does not necessarily mean that plastic bottles must be thrown in the trash. Many sources say that when plastic bottles end up in landfills or dumps.

Plastic is part of our daily lives. We are constantly using products that are made out of or packaged in plastic, for example, water bottles, carrying things in plastic carry bags.

II. LITERATURE REVIEW

There are some factors that must to be considered when plastic recycling is done. The recycling system is invented to be low-priced, scalable so that new product can be done by recycling of plastic, and it should be user friendly. A variety of plastic recycling have been considered where the control of pollution.

Khilesh Sarwe proposed Plastic waste is silent threat to the environment and their disposal is a serious issue for waste managers. Now a day society does not have any alternative to plastic products like plastic bags, plastic bottles, and plastic sheets etc. In spite of all efforts made to limit its use but unfortunately its utility is increasing day by day. To circumvent this issue many efforts were made in the past to reuse the plastic waste but no significant results were achieved. In his paper, said that the use of plastic recycling can require considerable cost and pollution can be reduced by recycling process.

Pramod S. Patil recommends the use of plastic recycling is more important this study has incorporated use of recycled For clarity purposes, this documentation is focused on a set of representative the plastic recycling also helps in

reducing the uses and standard plastics, or engineering plastics. There are many different plastics, so we need ways of making sense of them all by grouping similar ones together. Plastic are suitable because they are disposable, however, disposable does not necessarily mean that plastic bottles must be thrown in the trash.

III. PROBLEM DEFINITION

A. Introduction to Problem

Our project is based on plastic waste recycling Due to lack of knowledge, different types of plastic are often combined in manufacturing processes, which makes recycling them much more difficult. This often leads to plastics being incinerated, which is a major waste of valuable resources. We have the tools and knowledge to create circular recycling for plastics.

Our project main purpose is that to reduce plastic pollution which is adversely affecting human being and overall society which it is causing harmful and health issues to human beings and there is effect on environment as well it plays a vital role.



Fig. 1 High-density polyethylene bottles

B. Purpose

Our project main purpose is that to reduce plastic pollution which is adversely affecting human being and overall society which it is causing harmful and health issues to human beings and there is effect on environment as well it plays a vital role. The pollution due to plastics is the main reason for effecting the natural environment and plants, animals and other living things Recycling helps protect the environment.

Recycling reduces the need for extracting (mining, quarrying and logging), refining and processing raw materials all of which create substantial air and water pollution. As recycling saves energy it also reduces greenhouse gas emissions, which helps to tackle climate change. Also, one

more purpose is that to help the student to study the importance of plastic waste which is a major role playing in our day-to-day life.

C. Outline of project

In this project we have use plastic waste as raw material and it will be recycled in to plastic sheets. For this purpose we need different components to be used in plastic sheet making machine. As you can see we are using OTG oven for softening of plastic, to mould to give a desired shape of plastic sheet. After that the Silicon mat is used for nonstick of cooking. In this way the plastic softening process is done in the OTG oven. Our project main purpose is that to reduce plastic pollution which is adversely affecting human being and overall society which it is causing harmful and health issues to human beings and there is effect on environment as well it plays a vital role.

D. Plastic

High-density polyethylene (HDPE) or polyethylene high-density (PEHD) isa thermoplastic polymer produced from the monomer ethylene. It is sometimes called "alkathene" or "polythene" when used for HDPE pipes. With a high strength-to-density ratio, HDPE is used in the production of plastic bottles, corrosion-resistant piping, geo membranes and plastic lumber. HDPE is commonly recycled, and has the number "2" as its resin identification code.

HDPE is the most widely used resin for plastic bottles. This material is economical, impact resistant, and provides a good moisture barrier. HDPE is compatible with a wide range of products including acids and caustics but is not compatible with solvents. It is supplied in FDA-approved food grade. HDPE is naturally translucent and flexible. The addition of colour will make HDPE opaque, but not glossy. HDPE lends itself to silk screen decoration. While HDPE provides good protection at below freezing temperatures, it cannot be used with products filled above 190 °F (88 °C) or products requiring a hermetic (vacuum) seal.

E. Working Principle

Our project is basically based on Plastic Sheet Making Machine with Recycled Plastic Waste. Hydraulic jack is used for purpose of lifting of metal plate in which the plastic get compressed and the shape of sheet is occurred. Our project plastic sheet making machine is used for controlling of plastic waste and making a useful thing from the plastic waste. We need to do a certain procedure for recycling of plastic waste into sheet there is one oven used for melting of plastic and

later the process is done so, in this way plastic waste recycling process is done by using plastic waste.

IV. MANUFACTURING

Plastic film is a thin continuous polymeric material. Thicker plastic material is often called a “sheet”. These thin plastic membranes are used to separate areas or volumes, to hold items, to act as barriers, or as printable surfaces

1. Plastic extrusion: Plastic is heated and pushed in oven for melting.
2. Molding: Plastic is forced through a die that creates the final shape of the part.
3. Cooling: The extruded plastic is cooled.
4. Cut or spool: The continuous shape is finally given to the product.
5. Plastics can be machined, cast, formed, and joined with relative ease requiring little post-processing or surface finish operations
6. Plastics melt or cure at relative low temperatures
7. Plastics require less energy to process than metals
8. Sheet is prepared by moulding.
9. Also available as sheet, plate,(produced by moulding, etc.)

The simplest of plastic recycling processes involves collecting, sorting, shredding, washing, melting, and pelletizing. The actual particular processes vary based on plastic resin or type of plastic product. Most plastic recycling facilities use the following two-step process:

Step One: Sorting plastics automatically or with a manual sort to make sure all the contaminants are removed from the plastic waste stream

Step Two: Melting down plastics directly into a new shape or shredding into flakes then melting down before being finally processed into granulates.

Table No 1. Cost Estimation

Sr. No.	Comonents	Qty.	Price
1	BasePlate	1	1000
2	MouldPlates	2	1000
3	SteelBars	4	400
4	HydraulicJack	1	1800
5	Accessories(Nut,Bo lts,Revit)	4Set	100
6	Oven	1	2000
7	Labour		2000
Total			7100

V. TESTING AND FINAL PRODUCT



Fig.2 Hydraulic Jack Press machine



Fig.3 PlasticSheetPreparation(BottlecapCrush)



Fig.4 Sample And Final Product of Sheet

VI. CONCLUSION

In this project the pet water bottle caps are reused and recycled in to a plastic sheet. This sheet is useful for small cutting boards, stools and small table boards. We know that the pet bottle waste is a major problem all over the world. This is very dangerous to our environment. It is not only polluting the soil but also the sources of waters. Plastic waste bottles choke up the pipelines of drain waters and this causes floods.

There is a need of urgency in this situation. Project like this are helpful in solving the problem. But this is not sufficient for the quantity of waste disposed every year.

In future there can more advantage of plastic and many types of plastic can be used some of the are:

Polyethylene Terephthalate (PET or PETE or Polyester)
High-Density Polyethylene (HDPE)
Polyvinyl Chloride (PVC)
Low-Density Polyethylene (LDPE)
Polypropylene (PP)
Polystyrene (PS)

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