

# PLASTIC CRUSHING AND MELTING MACHINE

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## ABSTRACT

The main aim of the concept is used to optimize the crushing of plastic; this project is used to crush the plastic for application of molding operation. This machine is very useful for time savings and reduces the human fatigue. Purpose of making plastic crusher machine is viable to control plastic waste management. The project consists of heater, pneumatic cylinder, and solenoid valve and frame setup.

**Keywords:** Heater,PneumaticCylinder,Solenoidvalve,Frame setup

## 1.INTRODUCTION

Plastic recycling is the process of recovering scrap or waste plastic and reprocessing the material into useful products. Since plastic is non-biodegradable, recycling is a part of global efforts to reduce plastic in the waste stream, especially the approximately eight million metric tons of waste plastic that enter the Earth's ocean every year. This helps to reduce the high rates of plastic pollution. Plastic recycling includes taking any type of plastic sorting it into different polymers and then chipping it and then melting it down into pellets after this stage it can then be used to make items of any kind such as plastic chairs and tables. Soft Plastics are also recycled such as polyethylene film and bags. The project is about design of a Plastic Bottle Crusher which would help to crush the used Plastic bottles and would thereby help in waste management and disposal. A crusher is a machine designed to reduce large solid material objects into a smaller volume, or smaller pieces. Crushers may be used to reduce the size, or change the form, of materials so they can be more easily and efficiently used in the purpose intended to. Crushing is the

process of transferring a force amplified by mechanical advantage through a material made of molecules that bond together more strongly, and resist deformation more, than those in the material being crushed do. Crushing devices hold material between two parallel or tangent solid surfaces, and apply sufficient force to bring the surfaces together to generate enough energy within the material being crushed so that its molecules separate or change alignment in relation to each other. The equipment mainly includes the cutting machine and the crushing machine, whose basic principle is to destroy the material's integrity depend on the shear strength and the impact strength.

## II.EXISTINGSYSTEM

- They use mechanical set up crush the Plastics some of project use pressure with heat.
- But in our project we use pneumatic force to crush the plastic and we use high heater to melt the plastics.

### III.LITERATURE SURVEY

STEPWISE ACTIVITIES AND SUB-ACTIVITIES Singhal, Anurag Sahu and et al., Has been explained about design of a Plastic Bottle Crusher which would help to crush the used Plastic bottles and would thereby help in wastemanagementYeshwantM. Sonkhaskar, Amit Choubey, AmritpalBhamra, Raghavand disposal. This project aims to design portable Plastic Bottle crusher that could be installed anywhere and would aid crush of usedbottles.

Dr Muhammad MaqboolSadiq, Muhammad RafiqueKhattak and et al., 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. Zainab Z. Ismail et al. They have conducted comprehensive study based on large number of experiments and tests in order to determine the feasibility of reusing plastic sand as partial replacement of fine aggregate in concrete.

YoucefGhernouti et al. The study present the partial replacement of fine aggregate in concrete by using plastic fine aggregate obtained from the crushing of waste plastic bags. Plastic bags waste was heated followed by cooling of liquid waste which was then cooled and crushed to obtained plastic sand having finesse modulus of 4.7.

### IV.PROBLEMIDENTIFICATION

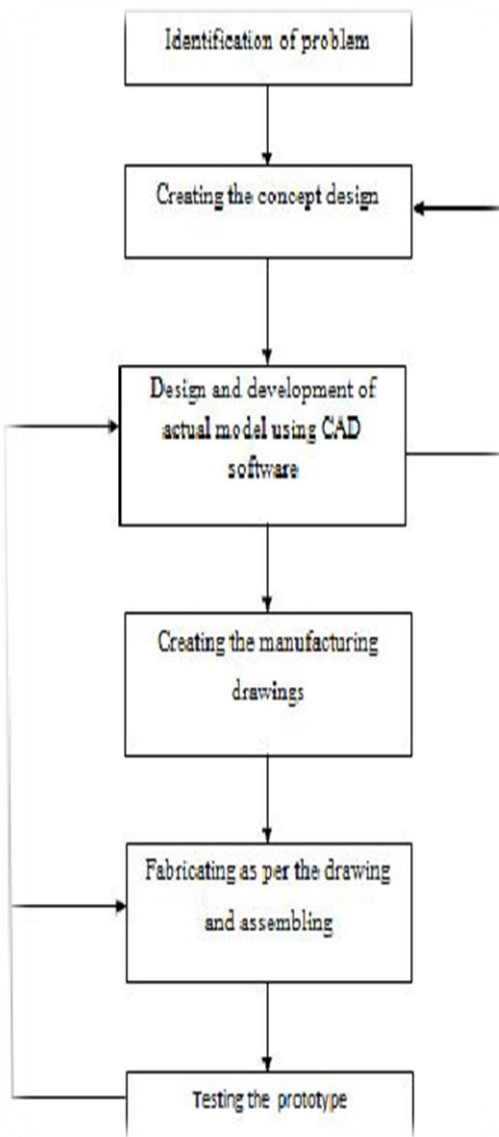
The existing crushers are heavy ones and these crushers are excessively used for crushing

materials at big industries and manufacturing plants for crushing cars, stones, metal components etc., Moreover, these crushers are hydraulically and pneumatically operated and are feasible if very high amount of crushing forces are required for crushing a material.

The operating costs of these crushers are very high as it requires continuous power, continuous maintenance as this involves hydraulic fluid or compressors kits etc., these type of high end crushers are not necessary for small recycling plants and is not affordable to many people. It requires proper maintenance as the hydraulic fluid needs to be changed constantly on time basis. It also requires skilled labor for operation.



## V.METHODALOGY



## VI.CONCEPT AND DEVELOPMENT

We have come up with a concept of designing a crusher in such a way that even a layman can operate it. The manufacturing cost as well as the maintenance cost is very less as compared to that of hydraulic machines. This crusher can crush the waste effectively and also the operating time is very less as compared to the existing ones. This crusher would best suit the small recycling plants and small industries. The maintenance and manufacturing cost is less since it does not use hydraulic or pneumatic fluids.

## VII.CONCLUSION

In this work, plastic recycling injection moulding machine was successfully designed, constructed and tested for plastic waste management in india. The testing of the machine concluded that strict adherence of operational procedures of the machines affects the efficiency and practicability of the machine. Heating PET material at 220°C completely melted the material. The molten material was forced under high pressure by the injection plunger into the mould cavity where it cooled to desired shape. Due to environmental awareness and economic importance of PET, the government of India as well as environmental institutions and research centres should sensitize the public on the importance of recycling plastic wastes through injection moulding technology. The government should further invest in this technology to help in recycling plastic wastes as well as provide jobs for millions of unemployed youth. Hence the implementation of this project by the government will result into environmental and economic benefits.

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