



BRICK FROM E-WASTE PLASTIC

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Abstract: The rate of urbanization has led to increasing plastic waste in generation. This is increasing has plastic waste, in plastic bags, bottles etc. The present based on waste utilization in brick Production has been researched. Only 40% of the 14,000 tonnes of post-consumer plastic garbage produced annually in India, according to statistics, was recycled. The remaining 60% of plastic debris is being disposed of in landfills and even floats in sewage and surface water. Consequently, the management of solid waste has advanced. resulted in replacement of construction materials as a replace with to conventional materials similar to brick.

I. INTRODUCTION

Because of population growth and plastic pollution of the environment (land, air, and water) the global scenario of human health and disease is at risk. At the moment, India generates 15, 500 tonnes of plastic trash annually as a result of manufacturing, mining, and other industries. In this study of progress is plastic waste replace to the construction materials like as bricks, paver, tiles, sewer pipe and cement etc, they for this article, here position to making and utilization of plastics in both hazardous and non- hazardous solid waste management of in India. The generous expansion the use of plastic waste is experimental all over the world in past years, which has leads to enormous quantity of plastic manufacturing good waste. This waste is not ecofriendly and will continue in a landfill lacking of difficult to environment pollutions and problem. So we are recycling to use again of this plastic waste. Plastic are tough and degrade very slowly. Since the science the 1950s, one billion tons of plastic have been useless and may preserve for most of even thousands of years. If brick is by most generally used for manmade building construction materials.

1.1 Objectives

The main target of this study is to analyze the carbon dioxide free cementitious material, various properties and their effects on Geopolymer brick.

- The efficient usage of waste plastic in plastic bricks has resulted in effective usage of plastic waste and thereby can solve the problem of safe disposal of plastics, also avoids its wide spread littering.
- A Present Study aims at evaluating the Performance of Plastic for Bricks Use in Construction and Other application areas.
- As Properties for Plastic Bricks, the same have Been of Studied for Various Mixes

varying % of Materials.

II. METHODOLOGY

The methodology which is adopted in this experimental study is discussed in this chapter has explained by a flowchart diagram Fig 1.

1. Collection of scrap polypropylene pipes and waste polyethylene bags from the locally.
 2. Identification of portioning of plastic sand into a defined ratio of (1:2, 2:1, 2:2, 2:3, 2:4, and 2:5) for producing samples of plastic sand bricks.
 3. Waste plastic was cleaned to remove all dust and other contaminants and cleaned plastic were kept to dry for 1 day.
 4. mixed properly using steel rod and poured into the molds. Before pouring the mixture into the molds, the sides of the molds were oiled for easily removal.
 5. Sample were kept for 24 hours for drying and removed from the molds.
 6. After the curing, test done for the sample bricks in laboratory.
 7. Polypropylene and polypropylene waste added into the heater in the ration of 1:1 and heated up to 180 °C.
 8. Melting point of polypropylene is 160°C and high-density polyethylene is 180°C
 9. Sands is added based on the desired ratios.
- Mixture was

2.1 MATERIAL USED

There are different types of materials used for the manufacture of plastic brick are,

1. Plastic
2. Sand

2.2.1 Plastic

Plastic is an essential component of many items, including water bottles, combs, and beverage containers. Knowing the difference, as well as the SPI codes, will help you make more informed decisions about recycling. When it comes to promotional giveaways, and even items we use around the house, there is no material more important than plastic. The same can be said for the items we use at the office. Most of our supplies contain at least a little bit of this material. In fact, humans have thus far produced 9.1 billion tons of plastic. For the sake of the environment, it's important to know the different types of plastic and their uses, as well as the resin identification codes found on each. Take a walk through your house or office and you're guaranteed to stumble across a variety of plastic products like water bottles and pens. No material is more commonly used in our everyday lives! It's easy to classify everything as simply "plastic." We are using LDPE plastic for our project because it takes less time for melting when compared with other of plastics.



Fig. 1- Plastic

2.2.2 Sand

Sand is composed of all kinds of rocks and minerals, so its chemical properties greatly vary. Most sand is made of quartz, which is largely silicon oxide. Physically, sand is made up of tiny, loose grains of rocks or minerals that are larger than silt but smaller than gravel.

Sand is a granular material composed of finely divided rock and mineral particles. It is defined by size, being finer than gravel and coarser than silt. Sand can also refer to a textural class of soil or soil type; i.e., a soil containing more than 85 percent sand-sized particles by mass. The composition of sand varies, depending on the local rock sources and conditions, but the most common constituent of sand is silica (silicon dioxide, or SiO_2), usually in the form of quartz. Sand is a non-renewable resource over human timescales, and sand suitable for making concrete is in high demand.

The sand passing through 4.75mm sieve is used in concrete. The collection and utilization of sand is as per the Indian standards of IS. Normally the river sand will used for making of paving



Fig. 2 - Sand

III. RESULT AND DISCUSSION

4.1 Compressive Strength Test

It is the most common of all test of brick is the compressive strength test because of the intrinsic importance of the compressive strength of brick in construction. Three test specimens shall be made from each sample for tested. To the test specimens are placed compressive machine of capacity 2000KN. It could be seen from the figure that the compressive strength was reduced significantly by 15% when replacing of waste plastic

Table 1

Si. No	% Plastic	Compressive Strength(N/mm ²)		
		7Day	10Day	
1	5%	14.8	15.2	
2	10%	23.1	23.6	
3	15%	26.5	27.2	



Figure 3: Compressive Strength Test

4.2 Efflorescence Test

The efflorescence test showed an excellent performance on the plastic soil bricks. There were no formation of grey or white layer on the brick surface. From this test we can conclude that no traces of alkalis were presented in this plastic soil brick whereas the burnt clay bricks showed a slight deposit of alkali on the brick surface.



Figure 4 - Efflorescence Test

4.1 Hardness Test

In this test, a scratch was made on brick surfaces. This test was carried out for all proportion of bricks. While the scratch was made with the help of a finger nail on the bricks, no impression was left on the sand brick surface whereas the burnt clay bricks showed a light impression on the brick surface.

4.2 Soundness Test

In this test, two bricks from same proportion were taken and they were struck with each other. The bricks were not broken and a clear ringing sound was produced same as that of burnt clay bricks. So the bricks are good.



Figure 5 - Soundness Test

4.3 Impact Test

In this test, the bricks were made to drop from a height of 1m on one of its corner. The bricks were not broken or shattered and it indicates the brick are of good quality.

IV. CONCLUSION

Following conclusions can be made based on the findings of these studies:

The brick specimen's strength was summed up. The other brick test is dependent on the components used make brick proportions, with fine aggregate being substituted with waste plastics. From the experimental investigation we found that the compressive strength and other brick test while compare with normal bricks strength behavior.

- The compressive strength of waste plastic brick proportion of various percentage strength is maximum strength of 27.7 N/mm² increased.
- The other test results are compared with plastic brick is good conditions and behavior.
- In this brick more than the normal brick all the air voids can arrest by the cracks to the brick. The cost of brick cost is reduced.

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