

# Use of Non-Biodegradable Material Plastic in Bricks

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**ABSTRACT:** In this report, we would like to say about the behaviour of waste materials such as non-biodegradable materials in the environment and the effective removal of wastes in the environment will leads to pollute our society.so many others techniques were used to reduce the waste but it was not hopeless. So the effective treatment of non-biodegradable wastes is done in our project without affecting our environment in the manufacture of bricks. In this technique we completely remove the wastes from the society without affecting the environment..

**KEYWORDS:** Non-biodegradable materials(plastics), quarry dust , cement.

## I. INTRODUCTION

Bricks are one of the oldest known building materials dating back to 7000BC where they were first found in southern Turkey and around Jericho. The first bricks were sun dried mud bricks. Fired bricks were found to be more resistant to harsher weather conditions, which made them a much more reliable brick for use in permanent buildings, where mud bricks would not have been sufficient. Fired brick were also useful for absorbing any heat generated throughout the day, then releasing it at night. The Ancient Egyptians also used sun dried mud bricks as building materials, evidence of which can still be seen today at ruins such as Harappa, Buhen and Mohenjo-daro. Paintings on the tomb walls of Thebes portray slaves mixing, tempering and carrying clay for the sun dried bricks. These bricks also consisted of a 4:2:1 ratio which enabled them to be laid more easily.

Using mobile kilns, the Romans were successful in introducing kiln fired bricks to the whole of the Roman Empire. The bricks were then stamped with the mark of the legion who supervised the brick production. These bricks differed from other ancient bricks in size and shape. Roman bricks were more commonly round, square, oblong, triangular or rectangular. The kiln fired bricks were generally 1 or 2 Roman foot by 1 Roman foot, but with some larger bricks at up to 3 Roman feet. The Romans preferred this type of brick making during the first century of their civilisation and used the bricks for public and private buildings all over the empire.

During the 12th century bricks were reintroduced to northern Germany from northern Italy. This created the brick gothic period which was a reduced style of Gothic architecture previously very common in northern Europe. The buildings around this time were mainly built from fired red clay bricks. Brick Gothic style buildings can be found in the Baltic countries, Sweden, Denmark, Poland, Germany, Finland, Lithuania, Latvia, Estonia, Belarus and Russia. The brick gothic period can be categorized by the lack of figural architectural sculptures which had previously been carved in stone. The Gothic figures were impossible to create out of bulky bricks at that time, but could be identified by the use of split courses of bricks in varying colours, red bricks, glazed bricks and white lime plaster.

# International Journal of Innovative Research in Science, Engineering and Technology

(An ISO 3297: 2007 Certified Organization)

Website: [www.ijirset.com](http://www.ijirset.com)

Vol. 6, Issue 3, March 2017

Metric bricks are a little smaller than the old imperial one.. Brick sizes have remained fairly constant over the years:-

- Metric and Imperial  $215 \times 102.5 \times 50$
- 1.  Standard Metric  $215 \times 102.5 \times 65$
- 2.  Metric  $225 \times 107.5 \times 67$
- 3.  Imperial  $230 \times 110 \times 70$
- 4.  Imperial  $230 \times 110 \times 73$
- 5.  Imperial  $230 \times 110 \times 76$
- 6.  Imperial  $230 \times 110 \times 80$

Although in the UK, the depth used to be less (about 2 ins/51mm) whereas modern bricks are about 2.5 ins/64mm

## II. RELATED WORK

**Chandan Rao, Vipin Kumar Kannaujiya** has concluded that “: Building with earth is one of those ancient technologies which still remain alive in the place untouched by industrialization. Innovation, however, has evolved in strength of compressed stabilized earth block with more strength gained. Mounted interest in searching sustainable green building material has created compressed earth stabilized brick which attract people for its low carbon emission especially in the production stage. This paper demonstrates the properties and benefit of CSEB compared to conventional brick especially in strength and durability. Past researchers has shown that with proper used of stabilizer and with right compressibility will improve the performance of CSEB. The result showed that compressed stabilized earth bricks are comparable with every respect of compressed stabilized earth block”.

**Silvia Smeu, Andrei Gal and Cătălin Badea** has concluded that” The continuous search for affordable and environmental friendly housing, led to investigations into new building masonry materials. Clay is a natural resource of the planet and one of the most common and has been recently “rediscovered” as anecologically sound and healthy building material. Due to problems with shrinkage and swelling of clays and changes in material properties, we tried to stabilize the mixtures realized with clay using cement, lime and sand as binder, and we also added sawdust in each batch made. The tests that we made were concerning: apparent density, bending tensile strength and compressive strength. By using clay and sawdust in this “rediscovered” building material, results a good impact on environment. The values obtained for compressive strength were within the acceptable standards for clay masonry units”.

**Nutan C. Patel1, Prof. Jayesh kumar Pitroda** has concluded that” Experiments have been carried out by several materials like Fly ash, lime, sand, Kheda dust, Glass fibre for the manufacturing of the brick. The fly ash of ‘F’ category was used as a raw material for making fly ash bricks. The combination of fibre fly ashbrick have different percentage of the Glass fibre adding like 0.2%,0.4%, 0.6%, 0.8%, 1.0%. In the testing of the fibre fly ash brick there are main two type of the testing is done compressive strength test and water absorption test after 7, 14, 21days. With Changing (increasing) in the percentage of the Glass fibre of compressive strength of the fibre fly ash brick is increase and water absorption is decrease”.

**D.Karunagaran** has concluded that “This paper discuss about the preparation of soil bricks using the bacteria which will give effective way to settle down in the natural phenomena. The bacteria that is used for the concrete repair to eradicate the plugging of pores and to avoid the cracks in the concrete. In this process it uses the microbial mineral precipitation to manufacture the bricks which will improve the behavioural pattern of the concrete. Also it will discuss about the chemical process takes place in the concrete. In this it will produce the adverse effect of the environment friendly bricks”.

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Vol. 6, Issue 3, March 2017

### III. EXPERIMENTAL RESULTS

The bricks manufactured for construction is followed by the normal steps under the provisions in the code book mentioned. The manufacturing process may vary depending on the materials used for construction, all the normal bricks used for construction must be cured for nearly 7 days as specified in the code book IS :1905 .

- Collect the materials used for casting of bricks
- They are mixed well before placed in the Rotating drum
- The Rotating drum mixes the mixture for nearly 60-90 rpm/seconds
- They are dropped in the Rotating Roller
- The Roller leaves the mixtures near the Mould
- The wastes are placed inside in the Mould
- By using the help of the workers the materials are allowed to leave inside the Mould
- It compacts nearly Six Bricks in one Round
- The compacted Bricks are uplifted at next Rotation
- The compacted Bricks are Removed by workers

- By Repeating the above process Bricks are produced continuously as depending upon the requirement

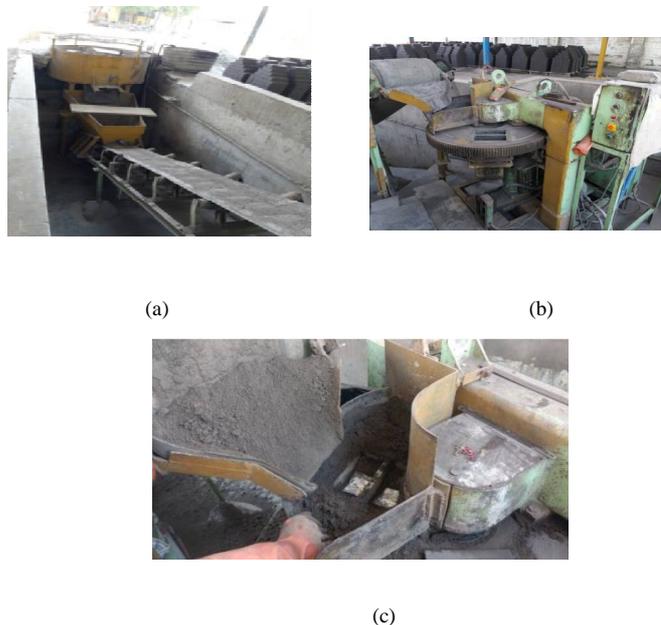


Fig. 1.Conveyor Belt (a) Casting Of Blocks (b) Replacement of Wastes in Normal Bricks (C)

#### a. Crushing strength

Remove unevenness in the bed faces to provide smooth and parallel faces by Grinding. Remove the bricks immersed in the water and allowed it to place in the normal atmosphere for 2-3days for complete drying

#### Procedure :

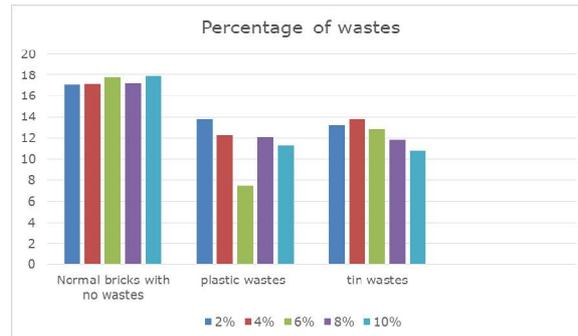
Place the bricks in the center of the specimen between two ply woods each of thickness of 3mm and the bricks should be placed in the center of the ply wood. Apply the load axially at a uniform rate of 14N/mm<sup>2</sup> per minute till the failure occurs the center of the bricks. The maximum load of the bricks can be determined by the varying load.

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Vol. 6, Issue 3, March 2017



(a)



(b)



(c)

Fig. 3 Table (percentage of wastes) (a) Original image (b) compressive strength testing (c) weight of bricks

## b. Water Absorption test

Preconditioning:

Dry the brick before weighting.

Procedure:

In the water absorption test procedure first dry the brick and obtain the weight (M1) then after a brick is put in the water pond for 24 hours. After 24 hours bricks are removed from water and after 3 minutes the weight of the brick is measured. The measured weight is called the weight (M2)

Sample	Water absorption in % for 7 days
0%	16.88
2%	15.28
4%	14.74
6%	14.17
8%	13.63
10%	13.26

(a)

Fig. 4 water absorption test results (a)

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Vol. 6, Issue 3, March 2017

## IV. CONCLUSION

From the addition of percentage of wastes in the bricks, we would like to conclude that, The wastes that are added in the bricks are quite increased in percentage ,will tends to reduce the compressive strength of bricks from the minimum standards of compressive strength 10N/mm<sup>2</sup> So if the percentage of wastes added are quite increased it should have a restrict in limitation of size 1/10th of Normal bricks.By following the above standards will totally reduce the “non –biodegradable “Materials from the environment.

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