



**TITLE: STUDY OF BRICKS MANUFACTURED FROM HYPOSLUDGE AND SUGARCANE BAGGASE ASH**

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**Abstract**

*The most important aspect of any project is its cost, durability, performance, conventionally were very uneconomical and time consuming, there is an urgent need for the development of new techniques which enhances the properties of brick. Bricks have been most important part of any construction project with the advancement of present construction industry; there is a great need to incorporate the use of industrial and agricultural byproducts and waste products along with the traditional construction materials. During the manufacturing of OPC, the manufacturing of one ton of OPC produces a 20% of carbon dioxide which is release into the atmosphere which is harmful to the environment. The paper industries produces large amount of wastes which is known as hyposludge. Similarly the sugarcane mills produce a large amount of sugarcane bagasse which is impossible to dispose and causes harm to environment. In this project study the hypo sludge was used along with sugarcane bagasse ash with different proportions for manufacturing a brick which shows a significant improvement in the properties of brick. On the basis of experimental results the compressive strength and water absorption capacity of brick will be carried out. Hence, it shows that good qualities of bricks can be manufactured by the use of hypo sludge and sugarcane bagasse ash and thus, the problem of decomposing of these constituents can also be solved to a great extent.*

**Index Terms:** *compressive strength, hyposludge, sugarcane baggase ash, durability.*

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## 1. INTRODUCTION

Bricks are the most important part of construction industry. As we have progressed in the technology, we have been able to develop more advanced forms of bricks. Traditionally, the bricks were made of clay. There are a lot of different kinds of bricks that serve different purposes. For example: The fly ash bricks are used in places where high insulation is required. Red clay bricks are most common forms of bricks that are used in the constructing buildings and houses. Besides comfort a building made of bricks are also very economical as they cost less in the long run. But present days because of low accessibility of

natural resources, the ordinary Portland cement and natural sand is being used rapidly in the world. So the production and utilization has rapidly increased. To reduce this rapid utilization we are using the hypo sludge and sugarcane baggase ash for the manufacturing of bricks as a partial replacement of cement, paper making industries generally produce a large amount of solid waste. Hyposludge can actually act as an adjoining material with the cement and can be used as a successful building material. If it is mixed with cement then it actually increase the strength increase the strength of the cement. It contains low calcium and minimum amount of silica and it's due to presence of silica and magnesium

properties that it behaves like cement. Similarly the sugarcane baggase ash is waste product of sugar refining industry. It is produced through several processes. And yields many solids waste in production. The major by products are bagasse ash, molasses, press mud. The only way of disposal of this baggase ash and hypo sludge is dumping which is dangerous for environment. So the attempt has made in this project by utilization of hypo sludge and sugarcane baggase ash in the replacement of cement. In turn, the problem of dumping this waste can be solved and thus, environment is protected by pollution.

### 3.1 Materials used:

#### 3.1.1 flyash:

Fly ash or flue ash, also called as pulverised fuel ash which is a coal combustion product which is composed of the particulates that are taken out of coal-fired boilers together with the flue gases. When the ash falls at the bottom of the boiler's combustion chamber is known as the bottom ash. It is a fine powder which is a byproduct of burning pulverized coal utilised in the electric power generation. Fly ash is a pozzolan, which is substance that forms fine powder when mixed with the water. When the flyash is mixed with the lime and water they form a particular product which is similar to the Portland cement. Flyash has advantages when used as a prime material blended with the cement, mosaic tiles, and hollow blocks, among other building materials. When the flyash is used in the concrete mix it enhances the strength and reduces segregation.

#### 3.1.2 Sugarcane Baggase ash:

Sugarcane bagasse ash is a byproduct of sugar factories obtained by burning the sugarcane baggase. The sugarcane industries are facing difficulties when disposed as the disposal of these wastes causes harms to the environment. On the other, due to the increased price of the cement the construction industry needs the alternative. This research paper overviews that the sugarcane baggase can be used as a partial replacement of the cement. In this research paper, bagasse ash sample was collected from deccan sugar factory and its chemical properties were investigated. The bagasse ash was then sieved properly from the 90 micron sieve size reach about 85% the

specific surface area about 4716 cm<sup>2</sup>/gm. Ordinary Portland cement replaced by ground bagasse ash at different percentage ratios. The normal setting and standard consistency of the paste were investigated.

#### 3.1.3 Cement:

Cement has a adhesive property which is widely used in the Civil Engineering infrastructures. These are the fine powders which forms a hard mass when mixed with the water. Setting and hardening properties determines the chemical characteristics of the cement. due to this hardening property it can be set under water also so called as hydraulic cement. The most important of these is portland cement.

#### 3.1.4 Hypo sludge:

Hypo Sludge or paper mill sludge is a major waste product of the paper industry. It is a by-product of the deinking and reinking of the paper industry. The million tonnes of paper waste is produced in these paper industries. The main recycling and disposal routes for paper sludge are it is directly spread on land or burnt completely and formed as ash. The utilization of Hypo Sludge as cement replacement material in the concrete can give a good strength as well improves the quality of the mortar.

#### 3.1.5 Quarry dust:

Quarry dust is a result of crushers from aggregate which are in small size while doing quarrying activities. Quarry dust was obtained from nearby quarries at the nearer places. The present investigations are conclude at studying the effect of quarry dust when it is replaced with sand partially in concrete. The physical properties of Zone II for following quarry dust were used in compressive strength study. In this program involves casting and testing cube as per specimens in each set consisting of 3 cubes. The variation in the standard deviation of strength should be greater than 10 N/mm<sup>2</sup> is not to be considered for every set of the whole series. The cubes which are cast using standard sizes which are as per is code cubes of 70mm x 70mm x 70 mm. Specific gravity which is obtained of sand and quarry dust of 2.62 and 2.70 for Zone II as per the is specification classified type is obtained. 53 grade cement is used for the mix which are generally used. Curing was done by conventional method of mix curing. Compression testing machine (CTM) which has 2000 KN capacity was used to test the cubes' specimens. The concept of replacement of natural fine aggregate could boost the consumption of quarry dust generated from quarries. By the replacement of quarry

dust, the requirement of land fill area can be reduced and it can be also solve by the problem of natural sand scarcity. The low cost sand availability is not suitable as fine aggregate is the reason to search for an alternative material. Quarry dust satisfies the all type of requirement behind the alternative material as a substitute for sand an low cost. It even causes burden. dump the crusher dust at one place. From the results of experimental investigations conducted,in it is concluded that the quarry dust can be used as a replacement for fine aggregate.

**METHODOLOGY:**

- Collecting of different industrial wastes such as hyposludge and sugarcane baggase ash i.e. hyposludge from the paper manufacturing industry Balarshah, Chandrapur and sugarcane baggase ash from mangloore deccan sugar.
- Preparation of mix design required for manufacturing the bricks from hyposludge and sugarcane baggase ash.
- After the mix design calculations the materials testing was done.
- As soon as the material is tested the cubes were casted from cement and quarry dust and tested for 3,7,28 days.
- Sample bricks were casted of different proportions and were tested.
- The bricks giving the highest compressive strength those proportions will be selected and will be taken further for manufacturing the bricks.
- As soon as the bricks are manufactured there will be various tests carried out on the bricks such as water absorption, compressive strength test, colour test, structure tests, sound test, density, efflorescence tests, impact test, and hardness test.
- The comparison will be done between bricks made from hyposludge and sugarcane baggase ash the bricks giving higher compressive strength will be selected.
- The brick with the higher compressive strength will be compared with properties of conventional bricks.



FIG: SAMPLE OF BRICK

**RESULTS:**

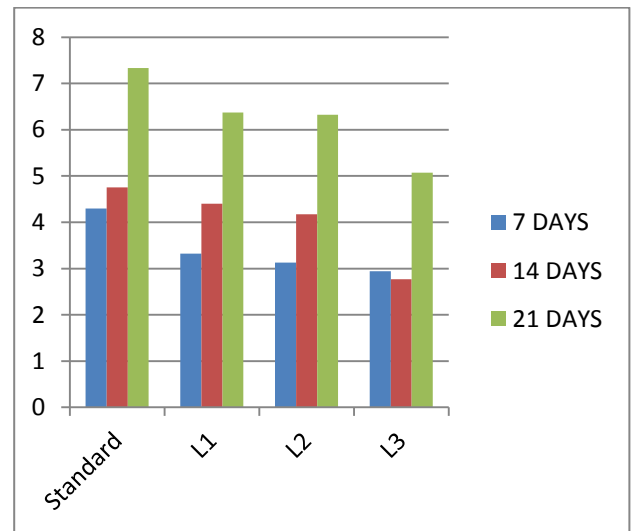


FIG: COMPRESSIVE TESTS OF HYPOSLUDGE BRICKS

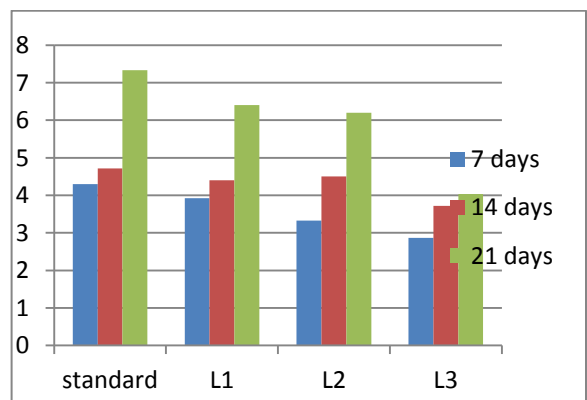


Fig: compressive strength test of Sugarcane Baggase ash bricks.

### 3. CONCLUSION

The bricks made from Hyposludge and Sugarcane Baggase ash gives a good compressive strength then a normal conventional brick. The brick proves to be very economical since it is made from industrial waste.

### ACKNOWLEDGEMENT

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