

**COMPARISION OF FLYASH AND CLAY BRICK AVAILABLE IN  
PRAYAGRAJ MARKET**ANURAG<sup>1</sup>, Dr.CHANDRA SHEKHAR MISHRA<sup>2</sup>DEPARTMENT OF CIVIL ENGINEERING, SHUATS,  
ASSISTANT PROFESSOR, DEPARTMENT OF CIVIL ENGINEERING, SHUATS

**Abstract**— *In today's world development of new building materials and Processing & utilization of industrial waste is given the high priority in the construction of buildings. Its important for achieving maximum disposal of wastes and conservation of renewable resources. The bricks produced were about 29% lighter than clay bricks. The compressive strength of bricks manufactured from fly ash possessed higher than 20 MPa. This exceeds the load carrying capacity of clay bricks available by more than 25% and is several times better than acceptable than commercially available common clay bricks. Other important characteristics of the fly ash bricks have been evaluated in the thesis. The values of these characteristics of fly ash bricks are good and have exceeded to those pertaining to clay bricks. The new bricks and process have been studied. This dissertation studies the results of testing and the advantages gained by this type of fly ash bricks over conventional clay bricks. In the present scenerio, the effects of fly ash on the properties of bricks are studied and the behaviour of fly ash bricks is compared with conventional clay bricks. The various properties of fly ash bricks with conventional clay bricks were tested. The properties studied were water absorption, hardness, efflorescence, soundness, shape and size, crushing strength and basic compressive strength.*

**Keywords**—*water absorption, compressive strength, efflorosence, fly ash bricks*

**I. INTRODUCTION**

Fly-ash bricks are manufactured using fly-ash as main composition. Lime and gypsum acts as an accelerator. Manufacturing process consists of preparation of mould and curing cycles at different temperature and pressure. Wherever required, crushed bottom fuel ash or sand is also used as a raw material in manufacturing of fly-ash brick. Pulverized fly ash reacting with lime in presence of moisture forms a calcium hydrate which acts as a binder material in the manufacturing process. These types of bricks are suitably used in masonry construction process of buildings. Government buildings are mostly constructed using this type of brick. Government is also promoting for using fly-ash bricks in place of clay bricks.

Most of the researches went through enhancing the clay brick quality and properties by mixing the clay with various recycled wastes as foundry sand, granite sawing waste, harbour sediments, sugarcane baggase ash, clay waste and fine waste of boron, sewage sludge, waste glass from structural wall and other different wastes More researches were held in developing bricks from wholly waste materials without exploiting any sort of natural resources, in order to achieve sustainability. They used entirely wastes in bricks making like waste treatment residual, granite waste, paper sludge, straw fibers, waste treatment sludge, fly ash and with few other wastes The conventional method of bricks making has caused serious environmental contamination represented by the enormous emissions of green house gases(GHG) resulted in unusual climate changes as smog, acid rain and global warming.

**METHOD AND METHODOLOGY****Water Absorption test**

Water Absorption tests were performed on flyash bricks and ordinary burnt clay bricks. Immerse the specimens in water at room temperature (22 °C) for 24 h. Weigh the specimens and record as  $W_s$  (saturated weight). Then, dry all specimens and record the weight of dried specimens as  $W_d$  (dry weight), where  $W_s$  and  $W_d$  are in Kg. The water absorption is calculated as  $\text{Absorption (\%)} = [(W_s - W_d) / W_d] \times 100$

More the water absorption, more the porosity and less the durability of the building unit

**Compression Test**

The brick specimens are immersed in water for 24 hours. The frog of the brick is filled flush with 1:3 cement mortars and the specimen are stored in damp jute bag for 24 hours and then immersed in clean water for 24 hours. The specimen is placed in compression testing machine with 6 mm plywood on top and bottom of it to get uniform load on the specimen. Then load is applied axially at a uniform rate of 14 N/mm<sup>2</sup>. The crushing load is noted. Then the crushing strength is the ratio of crushing load to the area of brick loaded. Average of five specimens is taken as the crushing strength.

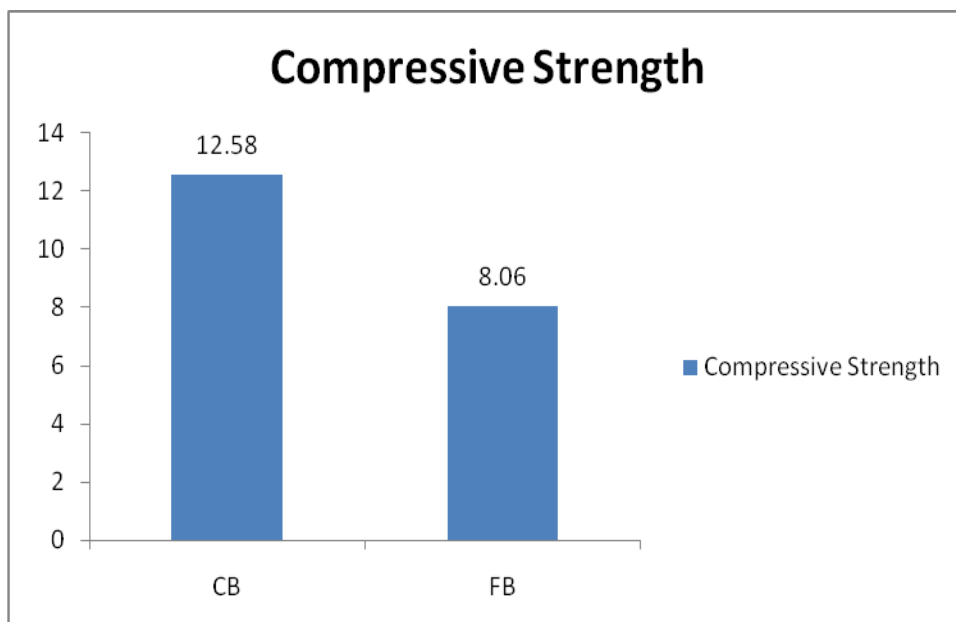
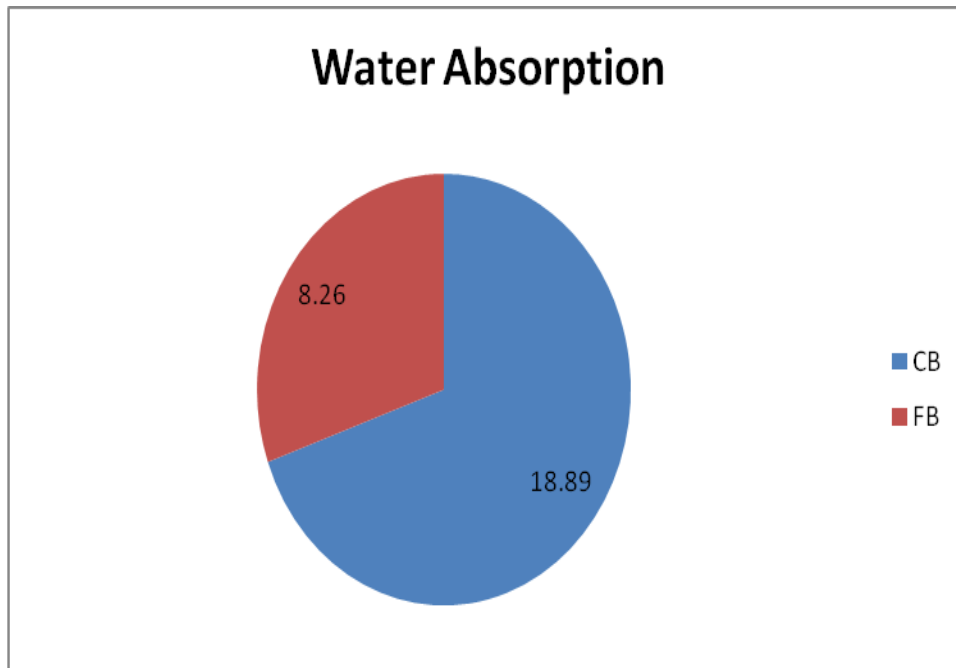
### RESULT AND DISCUSSION

On doing comparison between fly-ash brick and traditional clay-bricks many internet Sources and magazines makes the statements that the strength of fly-ash brick is comparative higher than the clay-bricks.

But the brick manufactured from Andawa, Koraon, Ghoorpur in Prayagraj U.P, the surprisingly results came out and the strength calculated in compressive strength test is low of fly ash brick as compared to clay brick. So, after applying various test and by performing it in multiple number of time the conclusion is made that it the manufacturing of fly-ash brick will not be appropriate than the impact on strength will be not good.

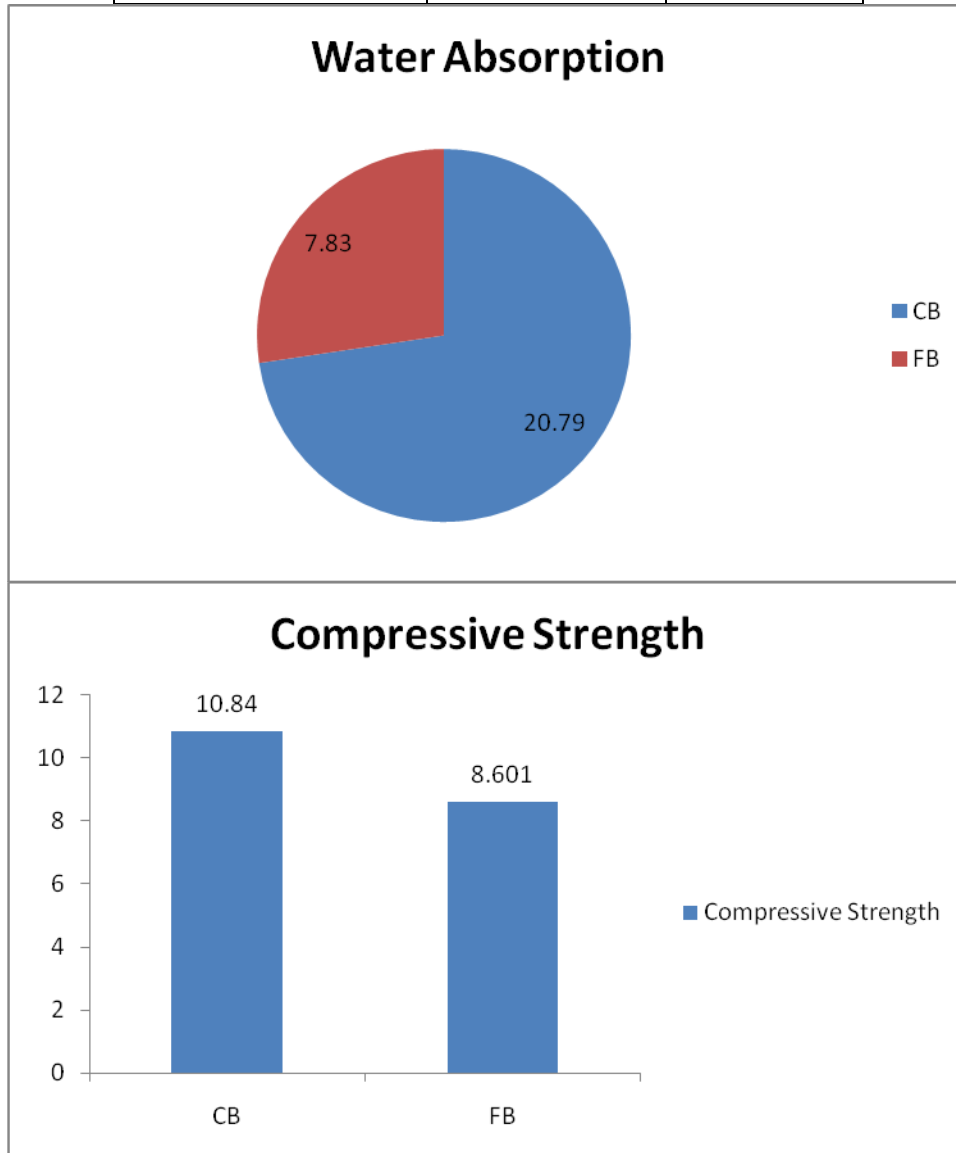
GHOORPUR

	CB	FB
Water Absorption	18.89	8.26
Compressive Strength	12.58	8.06



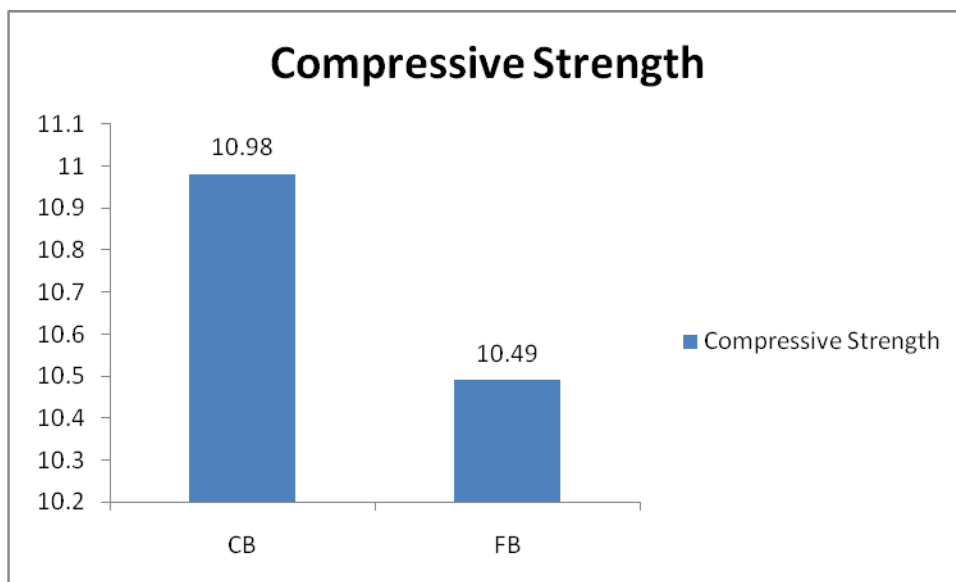
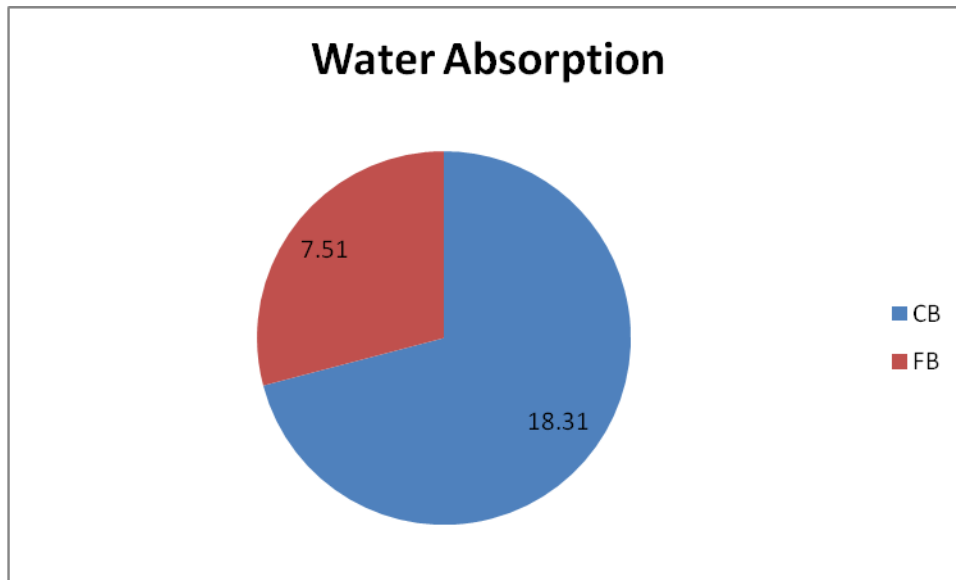
**KORAV**

	CB	FB
Water Absorption	20.79	7.83
Compressive Strength	10.84	8.60



**ANDAVA**

	CB	FB
Water Absorption	18.31	7.51
Compressive Strength	10.98	10.49



#### Classification on the basis of grade for clay brick

##### GHOORPUR

Class 1=8

Class 2=5

Class 3=2

##### KORAV

Class 1=4

Class 2=7

Class 3=4

##### ANDAVA

Class 1=4

Class 2=10

Class 3=1

Size =230\*115\*115 mm

#### FLY ASH BRICKS

Categorization of fly ash bricks is done on the basis of composition of its ingredients.

As the brick was purely manufactured using fly-ash so no categorization.

#### CONCLUSION

1. The Compressive strength of Fly-ash bricks comes out to be 8.06,8.60,10.49 which is very low as compared to traditional clay bricks
2. The water absorption of fly-ash bricks is 8.26,7.83,7.51% which is quite low as compared to clay bricks.

3. No signs of efflorescence are visible on fly-ash bricks.
4. The results of Compressive strength test shows that the fly-ash bricks, available in the market, do not comply with the strength requirements of bricks.
5. Weight of fly-ash bricks is less than that of clay bricks which helps in reduction of dead load.
6. The main outcome of this study is that the fly-ash bricks available in the market are not suitable for brickwork due to its low compressive strength, although its market rate is quite less than that of traditional clay bricks.

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