



A Review On Use of Sugar Mill Waste for Manufacturing of Bio Bricks

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Abstract: Brick is one of the most important material for the construction industry. This project is mainly based on reus of waste materials in to construction material. Utilization of industrial and agricultural waste products in the industry has been the focus of economic, environmental and technical reasons. Sugarcane bagasse ash is a fibrous waste product of the sugar mill industry. SCBA is partially replaced of 10%, 20% & 30% by weight in clay brick. Lime as a binding material for SCBA in to the soil India produces around 170 billion bricks per year, in the process consuming around 442 million tons of soil. Considering that the majority of the bricks produced will be burnt clay bricks, this volume of production will require about 230-240 million m³ of agricultural soil. The size of brick is 190x90x90mm. The fundamentals of brick manufacturing have not changed over time. However, technological advancements have made contemporary brick plants substantially more efficient and have improved the overall quality of the products. A more complete knowledge of raw materials and their properties, better control of firing, improved kiln designs and more advanced mechanization have all contributed to advancing the brick industry.

Index Terms – Sugarcane Waste, Bio Bricks, Eco Bricks

1.INTRODUCTION

Population state of affairs comes in the direction of India by using increasing industries. As the industries will increase also the waste coming from them at the end of product will increase. India is the second largest sugar producing country in the world. It contributes 20% at the total sugar industry in the world and accounts for about 15 % of the global production. Sugar factories produce large quantity of fly ash. This fly ash is a waste produced in the sugar factories and it causes air, water and soil pollution when it is exposed to environment. Therefore our aim is to use this bagasse ash and press mud for manufacturing of bricks. It also shows cement properties and works as a binding material and makes it light weight. The use of SCBA & press mud in bricks making also reduces the land degradation by replacing some amount of soil clay in it.

A Brick is a block or a single unit of a ceramic material used in a masonry construction. They have been regarded as one of the longest lasting and strongest building material used in 20th century. Manufacturing of bricks produces harmful gases which results in substantial air pollution. As per in India produces over 60 billion clay bricks annually resulting in strong impact on soil erosion and unprocessed emissions. Use of traditional technologies in firing the brick resulted in significant local air pollution. The standard size of brick provided by IS: 2212 (1991) is (19cm × 9cm × 9cm). Bricks are laid in horizontal courses, sometimes dry and sometimes wet mortar. In some instances, such as adobe the brick is merely dried.

2. NEED OF THE STUDY

As we all know that the waste from the industries is very harmful for the environment as well as to our health, if not disposed in proper manner. The fibrous residue of sugarcane after crushing and extraction of its juice, known as "bagasse". It is one of the largest agriculture residues in the world. The bagasse is however used as a biomass fuel for boilers, but after burning the by-product left is of no use and generally disposed into the rivers which affects the health of human being, environment, fertile land, sources of water bodies etc.

3. MATERIALS TO BE USED

3.1. BAGASSE ASH

Bagasse ash is a residue obtained from the burning of bagasse in sugar producing factory. Bagasse is currently used as burning product for boilers of sugar mill which is produces bagasse ash. Sugarcane production in India is over 300 million tons per year leaving about 10 million tons as unutilized. Therefore it is big issue of waste management. For each 10 tons of sugarcane crushed,

a sugar factory produces nearly 3.1 tons of wet bagasse called it as press mud which is by- product of the sugarcane industry. After it's burning it converted into ash which is having amorphous silica, indicating cement properties. It provides good bonding in case of weak soil.

3.2. LIME

Lime is produced when limestone is subjected to extreme heat, changing calcium carbonate to calcium oxide. Limestone is a sedimentary rock that formed millions of years ago as the result of the accumulation of shell, coral, algal and other ocean debris. High calcium lime is almost pure calcium carbonate. At about 1100°C, lime acts as a catalyst to elevate the furnace temperature to 1650°C at which silica fuses. This slightly fused silica works as a strong cementing material. Excess lime in brick clay will cause vitrification of bricks. It causes bricks to melt, as more than the required amount of silica will fuse.

3.3. CLAY

Clay is one of the abundant natural minerals on earth. Clay must possess some specific properties and characteristics.

3.4. WATER

Water is a crucial element of brick as it surely used for production of raw materials for giving proper mix. Water used for making bricks should be free from impurities

4. RESEARCH METHODOLOGY

4.1 Stage 1: Collection of materials.

1.1: Collection of sugarcane waste

The sugarcane waste material can be collected from the sugarcane factory,

1.2: Collection of soil.

Soil can be collected from near college campus area which is free from lumps and other type of waste. Further sieve test should be done before using for manufacturing of bricks

4.2 Stage 2: Preparation of bricks.

1. Required proportion of all raw materials such as SCBA, press mud, clay, lime and water are taken separately.
2. In order to obtain homogenous mix, SCBA and press mud are later added to lime slurry.
3. The freshly prepared mix is pressed into the mould.
4. Place it for sun drying until it becomes hard it takes nearly 4 to 5 days for removal of moisture and become hard.
5. After sun drying place it in clamp for burning at a temperature of 700°C to 1000°C for 28 days.
6. Kept it for Cooling near about 7 to 8 days.
7. Compressive strength test and water absorption test are to be conducted for to find the effective proportion of raw material

4.3 Stage 3: TEST ON BRICKS

Followings tests should be conducted on bricks to know their properties.

- Compression Strength test (BS 5628: Part 1: 1992)
- Water Absorption Test (IS 1077-1970)
- Efflorescence Test
- Soundness

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