

CONSUMPTION OF BAGASSE ASH AS AN EFFECTIVE BOOMING IN BRICK MATERIAL - REVIEW

B.Narendran & P.Mourigokul

B.E. Mechanical, Sigma SNS College of Engineering, Coimbatore- India

P.Ganeshkumar & T.Arunkumar

Assistant Professor, Chemistry Department, SNS College of Engineering, Coimbatore - India

Abstract

As we all realize that the waste from the industries could be very harmful for the surroundings as well as to our health, if now not disposed in proper way. The fibrous residue of sugarcane after crushing and extraction of its juice, referred to as "bagasse" is one in all the most important agriculture residues in the international. the bagasse is however used as a biomass fuel for boilers, however after burning the by-product left is of no use and generally disposed into the rivers which influences the health of human being, environment, fertile land, resources of water our bodies and so forth. Depending on the incinerating conditions, the resulting sugarcane bagasse ash (scba) might also contain high levels of SiO_2 and Al_2O_3 . makes use of of sugarcane bagasse ash waste in brick can keep the sugarcane industry disposal expenses and produce a 'greener' bricks for construction. in this studies the bagasse ash, lime, quarry dust and scrap can be used as the substitute of clay and sand within the burnt clay bricks. The distinctive proportions of the bagasse ash, lime, quarry dust and scrap are taken and bricks may be synthetic. After the full manufacturing system the bricks are to be tested in the laboratory and outcomes are analyzed concerning the water absorption and compressive electricity. The aim of this research was to make reasonably priced and inexperienced bricks to hold environmental stability and avoid hassle of ash disposal. It became also predicted that bricks must be lighter in weight, energy green and meet compressive energy necessities of is

1077:199

Keyphrases: *bricks, quarry dust, lime, sugarcane bagasse ash, scrap.*

Introduction

There may be a sturdy demand for environmentally secure reuse and powerful disposal approach for bagasse ash because of the growing quantity of sludge generated with the aid of the various industries or plant in india. Landfills are normally used for disposal of sludge in india, rapid urbanization has made it increasingly more tough to locate suitable landfill websites. Therefore, incineration has emerged as one of the few alternatives available for disposal of sludge. The remaining disposal of incinerate bagasse ash may be carried out by using it an engineering creation materials. One feasible solution for the control of this sludge is to re-use it as a constructing fabric, namely, to include this bagasse ash into bricks. The fired clay brick is one of the most commonplace and considerable masonry building materials and continue to be popular for its many feature homes. As such, the recycling of waste substances by using incorporating them into bricks has been a popular subject matter of research during the last century, with varying ranges of achievement throughout a huge variety of waste cloth. this recognition is probably because of flexibility at the type of wastes which can be mixed into the brick making material, but greater importantly, the excessive temperature concerned in firing the bricks lets in for the volatilization of risky issue, in addition to the fixation of wastes

into the vitreous phase of the brick. The cutting-edge study investigates the ability for reusing sugarcane sludge or bagasse ash through the use of it as a partial alternative cloth in clay bricks. Because of restrained availability of natural sources and speedy urbanization, there may be a shortfall of traditional building production substances. Alternatively, strength consumed for the manufacturing of conventional constructing creation materials pollutes the air, water and land. Accumulation of unmanaged agro-waste, especially from the developing nations, has an accelerated environmental difficulty. Consequently, improvement of recent technology to recycle and convert waste substances into reusable substances is vital for the safety of the surroundings and sustainable improvement of the society.

Literature Review

Kulkarni apurva , raje samruddha , rajgor mamta(1) studied that usage of industrial and agricultural waste products within the enterprise has been the point of interest of studies for financial, environmental, and technical motives. Bagasse ash can be used by replacing it with fly ash and lime in fly ash bricks. trial bricks of size (230x100x75) mm had been examined with specific proportions of 0%, 10%, 20%, 30%, 40%, 50% and 60% with replacement of fly ash and zero%, 5%, 10%, 15% and 20% with replacement of lime. madurwar v. mangesh, mandavgane a. sachin and ralegaonkar v rahul(2) have studied that utility of bio- fuel derivative sugarcane bagasse ash (sba) as a principal raw fabric for the manufacturing of bricks become studied. The bricks had been developed the usage of the quarry dust (qd) as a alternative to herbal river sand and lime (l) as a binder. The bricks with 20% addition of lime to sba and quarry dirt exhibited a compressive electricity of up to 6.fifty nine mpa, which is sort of double that of the conventional clay bricks (3.five mpa). the greatest composition of sba-qd-l brick is 15% and 25% lighter than the commercially available burnt clay and fly ash- cement bricks respectively. it turned into also discovered that masonry bonding of sba-qd-l bricks is more potent compared to commercially to be had fly ash and burnt clay bricks. Manufacturing technique of sba-qd-l bricks results in 50% and 6% discount in energy consumption over the commercially to be had burnt clay and fly ash- cement building bricks. The outcomes showed large capacity and scope for using the agricultural strong waste for manufacturing of constructing materials which can be strength- green, light-weight and sustainable.

Deng fong lin and chin huang weng (3) has used sewage sludge ash as brick material. The stop end result of the compressive energy check on the bricks crafted from each clay and sludge ash combinations. The best amount of sludge ash that might be combined with clay to deliver mix bonding bricks becomes 20% via weight. As shown with as plenty as forty% sludge ash brought to the bricks, the energy accomplished in any respect temperature can be as excessive as that of ordinary clay bricks. With as a whole lot as 50% ash in the bricks, the electricity is even higher than that of normal clay bricks. The compressive electricity of the bricks made from ash-clay mixture all meet the standards (cns 1999b) for the bricks requirement: one hundred kg/cm² for a primary elegance bricks and 75 kg/cm² for second

magnificence bricks. Its miles concluded that sludge ash may be combined with clay in extraordinary proportions to offer a top notch high-quality of brick beneath a superb firing temperature. at 20% sludge addition, a compressive electricity of four mpa might also still be viable.

Table -1. Chemical Composition of Bagasse Ash

Minerals	Percentage
SiO ₂	73
Al ₂ O ₃	6.7
Fe ₂ O ₃	6.3
CaO	2.8
MgO	3.2
P ₂ O ₅	4.0
Na ₂ O	1.1
K ₂ O	2.4
Loss of ignition	0.9

Objective of the Work

- To study the compressive strength of the brick by adding different percentage of bagasse ash and other material
- To study the cost of the brick.
- To check the density of the bricks.
- To utilize the waste materials available in the agro- industries.

Methodology to be Adopted

Initially literature survey is being done to have a look at the supply of the sludge in india. It has been observed that mass amount of the sludge is to be had in our united states. So we are able to deliver ahead our studies in this area. Then the materials which we ought to use are selected and the residences of these materials are studied. Then after choice the binding assets of those substances are tested whether the materials are forming a bond or now not. After testing binding property the specified proportions of the substances are decided on after which it's far blended collectively to mould a brick in definite form. The kneading method is very carefully done. After moulding the brick is removed from the mould and it's far remained on the equal level for drying. The drying have to be carried out carefully at room temperature firstly after which sun drying is executed for five days so that the desired strength may be attained. first off the water absorption test is performed, and then the maximum essential take a look at i.e compressive power test is completed the use of a compression trying out device a loading is carried out to the bricks. Till they failed and the most loading rate is recorded. the compressive strength is taken because the average end result from a fixed of five check for every respective brick type.

Materials to be Used

- Bagasse ash.

- Lime.
- Quarry dust.
- Metal Scrap.
- Water

Bagasse Ash

The burning of bagasse which a waste of sugarcane produces bagasse ash currently in sugar factories bagasse is burnt as a gas an amazing way to run their boilers this bagasse ash is normally unfold over farms and sell off in ash pond which causes environmental problems also studies states that workplace publicity to dusts from the processing of bagasse can cause the continual lung situation pulmonary fibrosis, more specially referred to as bagassosis. So there can be extremely good want for its reuse, also it is determined that bagasse ash is excessive in silica and is located to have pozollinic belongings so it can be used as opportunity to construction material.

Lime

Natural calcium oxide is fused with coke so one can render the highest yield in the manufacture of acetylene. The pleasant of the resultant carbide lime is an immediate end result of the first-rate excellent raw materials. Carbide lime is finer in particle length, and bodily, having a completely finely divided particle size makes carbide lime higher. a finer particle size approach quicker and more reactivity.

Quarry Dust

Quarry dust is a waste product produced all through the crushing technique that's used to extract stone. it's miles rock debris. While huge rocks brake in too small elements for the development in quarries. Its miles like sand however in the main grey in shade.

Tests to be Performed

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 dapower is the ratio of crushing load to the region of brick loaded. Average of 5 specimens is taken as the crushing power. mp jute bag for 24 hours and then immersed in clean water for 24 hours. The specimen is placed in compression testing device with 6 mm plywood on pinnacle and backside of it to get uniform load on the specimen. Then load is applied axially at a uniform fee of 14 n/mm².

Water Absorption Test

The bricks specimen are dried surely in an oven at a hundred+5oc and then weigh it as w₁. then immersed the brick in water for 24 hrs and wipe out the water from the bricks and once more weigh it as w₂. Water absorption= $w_1 - w_2 / w$

Conclusions

Burnt Clay Building Bricks—Specification, Bureau of Indian Standards, New Delhi. primarily based on the have a look at regarding the literature , the subsequent observations are made regarding the resistance of bagasse ash bricks:-

1. Use of bagasse ash in brick can clear up the disposal hassle; lessen value and bring a 'greener' eco- friendly bricks for production.
2. Environmental outcomes of wastes and disposal troubles of waste can be decreased via this studies.
3. This study facilitates in converting the non-precious bagasse ash into bricks and makes it precious.
4. on this research maximum compressive energy canbe attained.
5. The anticipated value of the bricks the seismic weight of constructing.may be decreased.

References

1. International Journal of Engineering Trends and
2. Technology (IJETT) – Volume 4 Issue 10 - Oct 2013
3. Madurwar V. Mangesh, Mandavgane A. Sachin and Ralegaonkar V Rahul Current science, Vol.107, No.6, 25 september 2014
4. C.-H.Weng, D.-F.Lin, and P.-C.Chiang (2003), Utilization of Sludge as BrickMaterials, [9] concrete era by ms shetty
5. Indian widespread: is 1077:1992, common burnt clay building bricks - specifications. bis, new delhi, 1997 (5th revision).
6. Alleman .j.e. bryan, e.h and stumm, t.a (1990).“Sludge amended brick manufacturing applicability for steel - laden residues.” water sci. and technol, 22(12), 309-317.
7. 317.
8. Tay, j.h., and display, k.y.(1999). “Constructive sludge disposal choice converting sludge into modern civil engineering cloth.”trauner, e.j.(1993). “Sludge ash bricks fired to above and under ash vitrifying temperature”.
9. Kevin Hii, Abbas Mohajerani, Paul Slatter and Nicky Eshtiaghi - Reuse of Desalination Sludge for Brick Making School of Civil, Environmental and Chemical Engineering, RMIT University, Melbourne, 3000, Australia.
10. A.M. Neville, Properties of Concrete, Fourth Edition.
11. ASTM (1998), ASTM C67 standard test method for sampling and test brick and structural clay tile. Annual book of ASTM standards, Sec.
12. I.S.: 3495(part-III) - 1976 - Method of tests of burnt clay building brick part- III (Second Revision).