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Investigaton and Preparation of Fly Bottom Ash and Discussion on Fly Ash Composition – A Review

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ABSTRACT
This inquisition is to abstraction the inert contents of fly bottom ash. Fly bottom ash is the biggest pollution in land. Fly bottom ash occupy more space and it causes land pollution. Utilization of fly bottom ash in different region. It is a material which capture and store atmospheric carbon-di-oxide. Fly ash is mostly used in construction works. Mixing of some minerals in fly ash like Calcium sulphate dihydrate and calcium hydrated and it will increase the ability of using fly bottom ash in construction works. The main reason for choosing the construction region is the maximum demand is on construction works now a days. Using calcium sulphate dehydrate and calcium hydrated for increasing the strength of bricks. Pollution made by a thermal industry are more and so using some technology to reduce it.

KEYWORDS: *Calcium sulphate, calcium dihydrate*

1. INTRODUCTION
Coal dust has historically been collected as a waste product from industry. Coal dust is nothing but it is a fly ash. The bulky metals found in fly ash are toxic in nature. Disposing the fly ash is very difficult in coal-fired thermal power plant. Utilization of fly ash reduces the pollution and so fly ash been used in the manufacturing of raw materials like bricks. Fly ash bricks are lighter and stronger than clay bricks. Due to high strength, practically no breakage during transport and use. Cost of the production also reduced and pollution also controlled.

2. GYPSUM
Gypsum is the most common sulfate mineral. Gypsum is also a recycle material. Gypsum are used to reduce the usage of water consumption. Wet surface remains for more days to setting the bricks.

3. LIME
Lime is a calcium containing inorganic mineral in which oxides, hydroxide and predominate. Mixture of calcium oxide and water produce calcium hydroxide (lime). Lime are used in many industry purposes because mixture of fly ash with lime making material strong. The Figure 1.1 shows the production of lime stone.

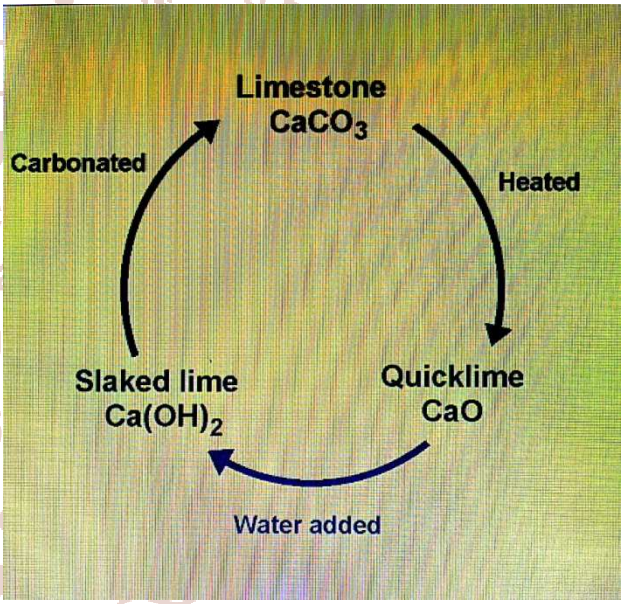

Figure 1.1 Production of lime stone

4. METHOD OF MANUFACTURING
The collection of materials is allowed to mix in the pan mixer and then it is carried by the conveyor to the machine. And then it is transferred to wooden rack there it is allowed to set for 2 days and also water is cured for 7 days.

Then it is allowed to dry for 3 days. Then the good bricks are sorted and tested in the lab and finally it is dispatched. The Figure 1.2 shows the process of manufacturing.

Figure 1.2 Process of manufacturing

5. MIXING PROPORTIONS

Material	Mass
Fly ash	60%
Sand/Stone dust	30%
Lime+Gypsum	10%
Total formula of material	100%

Table 1.1 Mixing proportion

Proportion	Fly Ash (%)	Lime (%)	Gypsum (%)	Quarry Dust (%)
1	15	30	02	53
2	20	25	02	53
3	20	30	02	48
4	25	20	02	53
5	30	15	02	53
6	35	10	02	53
7	40	05	02	53

Table 1.2 Various mix proportion

COMPRESSIVE STRENGTH:

Proportion	7 Days ($N/Mm^{2)}$	14 Days ($N/Mm^{2)}$	21 Days ($N/Mm^{2)}$
1	1.98	3.95	7.91
2	1.68	3.36	6.78
3	1.81	3.43	6.97
4	1.44	3.08	5.98
5	1.22	2.43	5.34
6	1.03	1.97	5.04
7	1.12	2.23	5.14

Table 1.3 Compressive strength (N/mm^2)

Ertugrul Esmeray, Mustafa Atıs (2019) Fly ash bricks are manufacture by waste product from thermal industry. Table 1.1 shows the mixing proportion of fly bottom ash bricks. Bricks are manufactured with correct composition. It should be tested in different way for improving the property and strength. Chemical products are added for improving the strength. Waste products are added for reducing pollution caused by more industry. Fly ash bricks are used in construction field for reducing the pollution. Fly ash bricks are strong when compared to the normal bricks.

Y. Deng, B. Gong et al (2018) Municipal tab solid waste has become a global environmental issue. There are many waste products in our environment, among that Fly ash is also one of the wastes. Table 1.2 shows the various mix proportions. Fly ash is mainly used in construction works. Fly ash is used in many places to reduce the pollution. The above table 1.3 shows the compressive strength (N/mm^2). Lime stone and fly ash are mixed together in correct composition to increase the strength of the fly ash bricks.

Sivakumar Naganathan, Almamon Yousef Omer Mohamed (2015) Conventional clay bricks absorbs more percentage of water when compared to fly ash bricks. More curing will lead to higher damage on fly ash bricks. Curing on bricks for three days will increases the brick strength. The result shows that the better performance compared to conventional clay bricks in the properties investigated.

Tayfun Çiçek, Yasin Çinçin (2015) In this study, fly ash is also used as a coal combustion product. Many tests are used to check the quality of the fly ash bricks like compression test, hardness test, shape and size test, etc. To test the size of the fly ash bricks it is compared with the real size bricks and it is adjusted according to the real size of the conventional bricks.

Ayse Bicer (2018) Fly ash are used in construction field for reducing the pollution of the fly ash. Industry near township reduces the cost of the transportation. cost for making brick is low but purchasing and transportation of the material cost is more.

Abdallah Dindi, Dang Viet Quang (2019) Fly ash bricks store the carbon di oxide gas. carbon di oxide is the one of the dangerous gas and It will affect the people. This project helps to store the carbon-di-oxide and reduce the pollution caused by thermal power plant.

Shamiso Masuka,_Willis Gwenzi (2018) Standards engineering specification for low-density clay masonry units, while the cost was 50% lower than that of cement stabilized bricks, demonstrating the low-cost of the UEBs. In summary, the results demonstrate that improved low-cost UEBs can be developed by incorporating lime, coal fly ash and wood aggregates, but a little cement (4%) may be required to increase the wet compressive strength.

C. Fernández-Pereira, J.A. de la Casa (2011) Some mechanical and environmental properties of ash gasification bricks were studied and compared with typical values for commercial bricks. The results lead us to conclude that the bricks could be used commercially as low-density clay masonry units with a good thermal insulating capacity and, therefore, the potential for commercial development is promising. In addition, the environmental benefit of waste gasification added to the ash utilization makes the overall process more attractive.

Ravi Kumar, Najia (2015) The cost of conventional bricks is increasing day by day. The conventional bricks are suitable for efflorescence and also the conventional bricks will absorb more amount of water. These bricks will cause emission of harmful gases. To overcome this problem many materials are used to make bricks with less harmful and also at low cost. And also, it should be less weight than the conventional bricks. Fly ash is one among the material.

Gang Xu, Xianming Shi (2018)
Fly ash bricks are should be maintained at respective temperature because over heated causes bricks damaged. When temperature are more means Ordinary bricks are not damaged, in case of fly ash bricks easily got damaged. Fly ash bricks should be dried for one week for better setting of bricks. Fly ash bricks should be curing for three days.

Safeer abbas, Muhmmad A.Saleem(2016)
Waste products are converted into useful material for to maintain the pollution. Recycle the waste product into useful product. Our project discusses the main pollution that is land pollution. It was main pollution caused by the thermal industry. Thermal industry produces more pollution like air, land, water etc., so this project reduce the land pollution caused by the thermal industry.

Syakirah afiza mohammed and mohammed rehan karim
Coal bottom ash increase more when compared to last year so usage of bottom fly ash increases and so it will be same or otherwise pollution become more and cause more damaged to environment. Recycle of the waste product (bottom ash) should be increased for reducing the pollution. Fly bottom ash is less in weight and it will occupy more space. Whenever usage of fly ash is reduced means pollution are increased and so it cause above pollution.

Yueyi gao, Chuanlin hu(2016)
Replacing the Portland instead of fly ash brick increase the cost. Strength of the fly ash is more when compared to the ordinary bricks. Cost of the fly ash bricks are less when compared to ordinary bricks. Weight of the fly ash bricks are more when compared to ordinary bricks. More tests are taken for the comparison that is compressive strength test, water absorption test, efflorescence test, hardness test, size, shape and color test, soundness test and structure test are taken for finding the which one is best brick.

Conclusion

The utilization of coal bottom ash is one of the options to reduces the environmental problems related to the disposal of bottom ash. This process also helps in converting industrial waste material into quality building material is a moderate solution for the pollution issues. The project very useful to reuse the waste (unwanted), pollutant material into industrial product.

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