



MECHANIZER
ENGINEERING & TECHNOLOGY
Perfect Machinery Assembler

AUTOCLAVED AERATED CONCRETE (AAC) BLOCK PLANT.



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WHO We Are

AAC (Autoclaved Aerated Concrete) was invented in the mid-1920s by the Swedish architect and inventor Johan Axel Eriksson. AAC is one of the major achievements of the 20th century in the field of construction. It is a lightweight, precast building material that simultaneously provides structure, insulation, and fire and mold resistance. AAC Blocks is a unique and excellent type of building materials due to its superb heat, fire and sound resistance. AAC block is lightweight and offers ultimate workability, flexibility and durability.

Main ingredients include fly ash, water, quicklime, cement, aluminum powder and gypsum. The block hardness is being achieved by cement strength, and instant curing mechanism by autoclaving. Gypsum acts as a long term strength gainer. The chemical reaction due to the aluminum paste provides AAC its distinct porous structure, lightness, and insulation properties, completely different compared to other lightweight concrete materials. The finished product is a 2.5 times lighter Block compared to conventional Bricks, while providing the similar strengths.

A decorative orange graphic element consisting of a thick, rounded horizontal bar that curves downwards and to the right, resembling a stylized 'L' or a corner bracket.

ASSUMPTIONS:

Fly ash is to be provided free of cost by power plants. Only transportation is to be arranged by project. Average distance of 100 KM (price depend on state).

Carbon Credit estimates is for reference purpose. The Project owner must handle his part of CDM project to get Carbon credits, through independent consultants. Carbon credit can be transacted on registration. The PCN preparation & presentation, the PDD preparation & presentation, host country approval and the UNFCCC Registration might take somewhat 6 months to 2 year. So it may be wise to start early

Sale price at site is estimated at conservative Rs 3000/- per cubic meter.

ADVANTAGES:

The advantages are as follows:

1. Consumes Fly ash, which is a big problem for thermal power plants to dispose. It is environment friendly, because of no need of burning.
2. Higher strength, best thermal insulation & excellent sound absorption, vibration resistance compared to red bricks. The AAC product's lightweight and easy workability means that is very quick to install on site and transportation with lesser breakage.
3. AAC blocks made walls can be left exposed (without Plaster) and gains strength over time. It saves structural cost by 35% and recycling of breakage, rejects also.
4. AAC products are not affected by harsh climatic conditions and will not degrade under normal atmospheric conditions.

5. AAC Block does not have any toxic substances nor does it emit odors. Its production, management and disposal do not represent any health risks or damage to the environment. Its production process develops non-toxic gases.


6. AAC blocks are bigger in size than conventional bricks, resulting in lesser number of joints. Less joints result in lesser quantity of mortar required, resulting in saving of mortar.

MARKET:

Fly ash is available continuously and of satisfactory quality. Users are of the opinion that strength, durability, finish, availability, price are the important qualities in blocks.

Since 60% of country's electricity comes from coal based power station, the country has a huge stock of fly ash amounting to 60 million tons annually. Despite the entire efforts present scenario is not too encouraging as only 5% of country's total ash has been consumed in different sectors. With the rise in population and increase in constructional activities considering the improvement in the standard of living the demand for building bricks is increasing day by day.

Very high willingness is observed among traditional manufacturers regarding use of fly ash in their products.



RAW MATERIALS, SOURCES AND AVAILABILITY:

Fly-Ash:

A lot has been said about this raw material in this Project Profile itself. But this Raw material is freely available in Thermal Power plants. There are no taxes on this item whatsoever. Transportation charges are only to be attended by the entrepreneur.

Lime:

Active powered lime is a requirement for giving the real aeration to the product. In phase 1 we can aim to buy the active lime directly. In phase -2 we can think of having backward integration and making a lime powering unit at site to have a more competitive advantage, we can also think of a lime burning kiln inside the factory premises.

OPC:

This Project aims to utilize OPC cement as main binder material. It will give faster strength to the bricks, besides giving improved consistent quality. It also ensures a better cost effectiveness for the same. Using OPC will be a standardized practice. The other prime advantage of using

OPC (compared to other binders) is its easy availability locally through nationwide Retail Network of Cement Companies.

Gypsum:

Gypsum is easily available industrial product. This is available as an industrial byproduct of Fertilizer Plant. Gypsum is responsible to give long term strength to the Blocks.

Aluminum Powder:

Finely ground Aluminum powder is used in very limited quantity (less than 0.5%), so that it reacts with active lime, and silica in base material to make the aeration, and swell the product, making it very light weight product.

PROJECT AT A GLANCE:

ProductDetails :- AAC Light weight Blocks. Type
:- Fly Ash Based or SandBased
TechnologyArea :- Infrastructure & Green technology
CapacityUtilization :- 95%

PROCESSDETAILS:

1 Mould Include 1.0 Cubic Meter Slurry.

1 Autoclave Include No. Of Mould Depends Upon Capacity of Plant.

1 Process Include 1 Autoclave (Process Time = 8 To 10 Hours)

Water Requirements :- 300 to 400 Liters per Cubic Meter.

CONSUMPTION OF RAW MATERIALS AND ENERGY NEEDED FOR PRODUCTION OF BUILDING MATERIALS:

BRIEF PRODUCTION PROCESS:

1. COAL FLYASH:

The coal fly ash will be sent to the slurry preparing pond by wheel loader to be prepared required concentration coal fly ash slurry by add rated water, which will be pumped into slurry tank to be stored and ready to be used.

2. QUICKLIME:

The powder will be sent into the lime powder silo for storage and ready to be used by bucket elevator, after coming into the factory.

3. GYPSUM:

The gypsum in the storage shed will be added into slurry pond according to the required proportion, while preparing slurry.

4. CEMENT:

The cement will be transported into factory by tank truck and directly is pumped into cement silo to be used.

5. ALUMINUM POWDER PAST:

The purchased aluminum powder past in the bucket or bag will be stored in its storehouse, When being used, it will be lifted to second floor of the batching building, then measured and added into aluminum mixer to prepare 5% suspending liquid to be used.

6. SCRAPE AND WASTESLURRY:

The cleaning waste water under the casting machine will be pumped to ball mill to be used as grinding water. The scrape from the cutting machine will be prepared to slurry and pumped into waste slurry tank to be used.

7. BATCHING, MIXING,CASTING:

Coal fly ash will be sent to electronic scale in the batching building by pump at the bottom slurry tank to be measured. When the slurry concentration arrives at batching requirement, the control system will turn off the pump to stop pump slurry. The measured the slurry will be directly discharged into casting mixer.

Lime and cement will be sent to electronic scale in the batching building by single screw conveyer at the bottom of their silos. When measuring arrives at the required quantity, they will be sent to casting mixer by screw conveyer.

Aluminum powder will be measured by manual, and added into aluminum mixer to be prepared suspending liquid one by one for each mould. The finished suspending liquid can be directly added into the casting mixer. The slurry temperature should be arrived at required process temperature before casting. And mould will be moved to the bottom of the casting mixer by ferrycar.

8. CUTTING ANDGROUPING:

After pre-curing, the green block arrive at the required strength, the crane will take it to the cutting machine section. After removing the mould, the green block will be cut according to the required size. The green block after cutting will be moved to the curing trolley with the bottom plate by crane in front of autoclave for grouping.

9. AUTOCLAVED AND FINISHED PRODUCT:

The green block after grouping, will be moved into the autoclave by windlass for curing. The whole curing period is approx. 12h, pressure approx. 1.2Mpa, temperature approx. 1850. After curing, the product will be pulled out of autoclave, and be sent to the storeyard.

10. THE BOTTOM PLATE RETURNING, COMBINING WITH MOULD AND OILING:

After unloading, the side plate on the trolley will be lifted for returning rail by crane, and be returned to the side of the cutting machine, which will be combined with the mould and sent to mould returning line for cleaning and oiling to be reused.

TECHNICAL SPECIFICATIONS OF AAC BRICKS:

Size (in Inches)	Size (in mm)	No of bricks /m ³	Weight (Kg's)	Market Price
24*8*4	600 X 200 X 100	83	8 - 9.5	41-44
24*8*6	600 X 200 X 150	56	9.5 - 11.5	61 64
24*8*8	600 X 200 X 200	42	13.5-15	82-85

PHOTOGRAPHS:

Just for technical clarity some of the photos of the real working are provided here.





TECHNICAL COMPARISON:

PARTICULARS	CONVENTIONAL RED BRICKS	AAC BLOCKS
Shape & Size	Non Uniform & Irregular	Uniform & Regular
Breakage/Wastage	8-10%	Nil - 0.5%
Density	1500-1700 Kg/M3	550-650 Kg/M3
Mortar Joint Thickness	15-18 mm	8-10 mm
Plaster Thickness	15-20 mm	10-12 mm

REMARKS:

1. Above listed configuration is standard reference, if any modification during equipment manufacture, or adjustment during installation causing equipment list change, our side will state explanation details in written format within 3 days, whole set producing line equipment list follows one complete line configuration, final reference as per acceptance qualified practical configuration.

2. Terms of payment: 30% Against Advance For Purchase Order, 30% After Completion 40% Work, 40 % Before Dispatch Machinery.

3. Lead time: 3months
4. Package uses large goods bulk packing, small goods and electric control partshave wooden boxpacking.
5. After-sales service and warranty: One year free service after successfulinstallation and One year warranty.
6. During equipment installation: Buyer provide local labour, welder, electrician, supporting equipments and fulfill other local requirements and also accommodation and food oftechnicians.
7. In any case order cannot becancelled.

DISCLAIMER:

1. This is for guiding prospective client, and helping them to understand theproject well.
2. This can also serve a basis for Clients Chartered Account for making a DPR for them.
3. This template with a little variation can be used to get the Pollution controlNOC, and other Docs.
4. The AAC project being Modular, there can be client specific needs, which maynot be mentionedherein.
5. As the raw materials vary widely, so also does the mix designs we suggest. So final costing mayvary.
6. The civil costs can vary depending upon the location and the client's rapportand grasp on thefield.

COMPARISON OF SMALL AAC AND AAC PROJECT:

No	Small AAC Plant	Big AAC Plant
1.	Capacity starts from 25,000 Cu. Mtr./ Year	Capacity starts from 1,00,000 Cu. Mtr./Year
2.	Expansion capacity up to 1,00,000 Cu. Mtr./Year	Expansion capacity up to 2,00,000 Cu. Mtr./Year
3.	Any size of block can be made easily	Any size of block can be made easily
4.	Shed area & civil work is very less.	Shed area and civil work is very huge.
5.	Investment cost per cu. mtr. Is lower	Investment cost per cu. mtr. Is higher than small plant
6.	Quality of block is same as big plant and better than CLC blocks.	Quality of block is same as mini plant and better than CLC blocks.
7.	Compared to production capacity, labour cost is same as big plant.	Compared to production capacity, labour cost is same as small plant.



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