FLY ASH BRICKS

1. INTRODUCTION

Fly Ash Bricks are manufactured using Major percentage of fly ash generated from Thermal Power stations. Other raw materials used along with Fly Ash are lime and calcined gypsum.

Fly ash is a fine, glass-like powder recovered from coal-fired electric power generation. They consist mostly of silicon dioxide (SiO_2), aluminum oxide (Al_2O_3) and iron oxide (Fe_2O_3).

2. PRODUCTS AND ITS APPLICATION

Fly ash lime bricks are chemically bonded bricks manufactured by utilizing 80- 82% of fly ash, which is a major waste bye-product of pulverized coal fired in Thermal Power Stations, 9-10% of lime, 9-10% of sand and accelerator. The process know-how has been developed by Central Fuel Research Institute. Various special features of fly ash lime bricks are:

a) Being machine finished these are uniform in size and shape. b) Consumes 20-25 percent less cement mortar. c) Stronger than Class-I, burnt clay building bricks. d) Outside wall plastering is not essential as these bricks have cement gray colour, smooth surface and low water absorption capacity. e) Resistance to salinity. f) Being lighter in weight in comparison to the conventional red bricks, the dead building load and the transportation cost will be less. g) Adoption of this process helps to conserve invaluable top soil of agricultural land. h) By consuming 80-82% fly ash, the cause of environmental pollution and hazards due to disposal is minimized. 10 i) As firing of the bricks is not needed thus pollution due to firing is eliminated.

3. DESIRED QUALIFICATION FOR PROMOTER

The promoter may be diploma in civil engineering or graduate in any discipline with experience in marketing of fly ash bricks or building materials. The communication and creating awareness are important key elements for success in this business.

4. INDUSTRY OUTLOOK/TREND

Infrastructure sector needs sizeable quantity of fly ash bricks for various types of construction. The government emphasis on development of infrastructure such as ports, railways, airports, housing etc. in near future will increase demand for brick in the country. The present trend is to use fly ash bricks instead of red bricks.

5. MARKET POTENTIAL AND MARKETING ISSUES, IF ANY

180 billion tons of common burnt clay bricks are consumed annually.Approximately 340 billion tons of clay- about 5000 acres of top layer of soil dug out for brick manufacture. Demand for dwelling units likely to raise to 80 million units by year 2018 for lower middle and low income groups. Demand for dwelling units will further grow to 90 million by 2020. The Indian housing sector at present faces a shortage of 20million dwelling units for its lower middle and low income groups which will witness a spurt of about 22.5million dwelling units. There is ample scope for fly ash brick and block units as government has ambitious plan of providing house for all by 2022. This will increase the demand for fly ash bricks substantially in the coming years.

6. RAW MATERIAL REQUIREMENTS

Fly ash forms the major component of the raw materials for Fly ash bricks. Therefore it controls to a large extent the properties of the finished product. As the ash is non-plastic, a binder must be added either plastic clay or Portland cement. Fly ash content ranges from 60 to 80%.

Lime is another raw material required for the production of fly ash bricks. It is generally desirable to use a high calcium lime of reasonable purity as it is the most important constituent which reacts with silica and alumina etc. present in the fly ash to form the binder under hydrothermal conditions. Lime content range from 20 to 30%.

7. MANUFACTURING PROCESS

It is proposed to have plant capacity of 30,000 fly ash bricks per day. Considering 300 working days, total production of bricks per annum would be 90,00,000.

Lime is finely ground in a ball mill. Fly ash, finely ground quick line and sand in requisite proportions are fed in double roll paddle mixer or U-shaft mixer (Double shaft mixer) by means of a feeder. Then 4% water is added and intimate mixing is done. The mixing proportion is generally 40-50% Fly Ash, 50-40% Sand 10% lime and 4% water. Fly ash reacts with lime in the presence of moisture to form calcium silicate hydrate which is the binder material. The raw mix is moulded in the moulding press/machine, pressed under a pressure into bricks. The bricks are then with drawn from the moulding machine and they are air dried under the sun and kept for 1 day. The bricks are autoclaved in which curing is done by steam at normal pressure and cured for 6 - 8 hours.

The final products are sorted out and inspected for quality and stacked in the go-down or loaded on trucks for marketing for use in construction.

8. MANPOWER REQUIREMENT

For the production of Fly Ash Bricks following category of manpower will be required for day to day production. Annual wages are also worked out.

Sr.No.	Designation of Employees	Monthly Salary ₹	Number of employees required	Value Rs. in lacs
1	Skilled Workers	6,000	16	11.52
2	Unskilled Workers	4,000	24	11.52
3	Manager	15,000	1	1.80
4	Asst. Manager Production	9,000	1	1.08
5	Shift Supervisor	8,000	2	1.92
6	Marketing Personnel	8,000	2	1.92
7	Accountant	3,500	1	0.42
8	Clerk/Typist	3,000	1	0.36
9	Electrician-cum-Mechanic	6,000	2	1.44
10	Machine Operators	21,000	6	15.12
11	Peon/Security Guard	8,000	4	3.84
	Total		60	50.94

9. IMPLEMENTATION SCHEDULE

The implementation time required for setting up the facilities for the manufacture of fly ash bricks will be about 10 months from the date of tying up of finance. The main time required is for fabrication of equipment, erection, installation and commissioning. Moreover, training of technical manpower will also need about one month.

10. COST OF PROJECT

The cost of project as per market rate of factory building, machinery, miscellaneous items, working capital margin and preliminary and pre-operative expenses works out as under:

Sr.No.	Particulars	₹in Lacs
1	Land	150.00
2	Building	24.50
3	Plant & Machinery	66.00
4	Furniture, Electrical Installations	0.50
5	Other Assets	26.00
6	Margin for Working Capital	16.18
	Total	**283.18**

11. MEANS OF FINANCE

Based on the present norms of the bank, means of finance is worked out as under.

Means of Finance

Sr.No.	Particulars	₹in Lacs
1	Promoter's contribution	99.11
2	Bank Finance	184.07
	Total	**283.18**

12. WORKING CAPITAL CALCULATION

Working capital required for storage of raw materials and finished goods, monthly overheads, goods in process, receivables and trade credit is worked out based on the present norms of the bank as under.

Working Capital Calculations

Sr.No.	Particulars	Gross Amt.	Margin %	Margin Amt.	Bank Finance
1	Inventories	-	40%	-	-
2	Receivables	184.07	40%	-	184.07
3	Overheads	-	50%	-	-
4	Creditors	283.18	40%	-	283.18
	Total	467.25		-	467.25

13. LIST OF MACHINERY REQUIRED AND THEIR MANUFACTURERS

For the production of fly ash bricks, main machinery required are as under:

1. Skip hoist including feed hopper.
2. U-Shaped mixer/double-shaft mixer/ counter-current mixer.
3. Belt conveyor
4. Press feed hopper with vibrator

5. Rotary table press.

6. Transfer& Curing cars.

7. Curing chamber/autoclave

8. Boiler, capacity 500 Kg/

9. Pollution control equipment.

10. Weighing balance& testing equipment's.

Above machinery can also be used for the production of Blocks.

- Sahjanand Flyash Bricks Plant Pvt Ltd
  RTO Relocation Site,
  Bhuj – 370020
  Gujarat

- J. V. P. Equipments
  S.F. No. 281/2, Nallathaneerthottam,
  Ganapathy, Ganapathi,
  Coimbatore - 641006,
  Tamil Nadu

14. PROFITABILITY CALCULATIONS

The profitability is worked out as under after taking into account all variable and fixed expenses as under.

Profitability Calculations

Sr. No.	Particulars	Year 1	Year 2	Year 3	Year 4	Year 5
1	Sales	236.25	270	303.75	303.75	303.75
2	Raw Materials & Other direct inputs	126.252	144.288	162.324	162.324	162.324
3	Gross Margin	109.998	125.712	141.426	141.426	141.426
4	Overheads except interest	22.505	25.72	28.935	28.935	28.935
5	Interest	14.175	16.2	18.225	18.225	18.225
6	Depreciation	7.35	8.4	9.45	9.45	9.45
7	Profit before tax	65.968	75.392	84.816	84.816	84.816
8	Income Tax	19.789	22.616	25.443	25.443	25.443

9	Net Profit After tax	46.179	52.776	59.373	59.373	59.373

The proposed unit will have the production capacity of 90,00,000 bricks per year. The unit cost of power is taken at Rs. 8. The depreciation on building is taken at the rate of 5% whereas for plant and machinery it is at 10%.

The sales price of fly ash brick is taken at the rate of Rs. 3.75 per piece.

15. BREAKEVEN ANALYSIS

The Break-Even point as percentage of targeted sales works out as under.

Cash Break-Even (as % of Targeted sales)

Sr.No.	Particulars		Value
			Year-1
1	Sales Realization	Rs. Lacs	337.50
2	Variable costs	Rs. Lacs	180.36
3	Fixed costs incl. interest	Rs. Lacs	32.15
4	BEP = FC/SR-VC x 100 =		20.46%

16. STATUTORY / GOVERNMENT APPROVALS

There is no specific statutory requirement for mineral processing industry.Moreover clearance from state pollution control board is must for producing mineral products. However MSME & GST registration, IEC Code for Export of end products and local authority clearance may be required for Shops and Establishment, for Fire and Safety requirement and registration for ESI, PF and Labour laws may be required if applicable.

17. BACKWARD AND FORWARD INTEGRATION

There is no possibility for backward integration, however forward integration can be done by diversifying in to allied products such as pavers, hollow blocks and cement products.

18. TRAINING CENTERS/COURSES

The plant and machinery suppliers provide in plant training for production of fly ash. They mostly have demonstration plant at their workshop. Moreover for latest knowledge and information Central Building Research Institute, Roorkee may be contacted.
Udyamimitraportal (link : www.udyamimitra.in) can also be accessed for handholding services viz. application filling / project report preparation, EDP, financial Training, Skill Development, mentoring etc.

Entrepreneurship development programs help to run businesses successfully and are available from Institutes like Entrepreneurship Development Institute of India (EDII) and its affiliates all over India.

Disclaimer:

Only few machine manufacturers are mentioned in the profile, although many machine manufacturers are available in the market. The addresses given for machinery manufacturers have been taken from reliable sources, to the best of knowledge and contacts. However, no responsibility is admitted, in case any inadvertent error or incorrectness is noticed therein. Further the same have been given by way of information only and do not carry any recommendation.