

THERMOCOL PACKAGING

1. INTRODUCTION

Expanded Polystyrene (EPS) foam mouldings, due to its high load bearing and shock absorption capacity, are worldwide used for packaging of sophisticated and fragile items.

EPS is a general purpose crystal polystyrene containing 5 per cent to 8 per cent of a volatile blowing agent usually pentane. When heated, preferably with steam, it can be converted to a variety of low density products. Processing of high density beads to low density products has applications as installation board, packaging and cups and containers. EPS installation boards having low thermal conductivity, are non-dusting and easy to fabricate and install. Blocks from which boards are cut, are also used as floatation members and fabricated into packages. Packaging components can be moulded to the exact shape of the content to provide uniform support to sturdy or delicate, light or heavy products. Unexpanded beads with a bulk density of 0.61 g/CC, 0.642 g/CC are freely expanded to a desired density of 20 to 40 kg/cum pre expanded beads are transferred after suitable ageing to a moulding press where they are fused together.

Expandable polystyrene is moulded to produce three kinds of foamed products, insulation board, shapes for packaging and coffee cups.

Whether moulded or fabricated, EPS. Packages and their components are typically designed by careful consideration of the compression and cushioning properties of expanded polystyrene.

2. PRODUCTS AND ITS APPLICATION

The expanded polystyrene moulded products are used in packaging application in

- Light Engineering industry - Fan, Motor, Typewriter, Fuel Pump, Mixer,
- Grinder, Electric Iron etc.

- Electrical & Electronics - Calculator, Video cassette recorders, computers, television, Audio equipments etc.
- Laboratory equipments.
- Instrumentation
- Foods & Beverages: Baby feed bottle cover, fish boxes, cold drink preservers, vaccine boxes etc.
- Brass Handicraft for exports.
- Defence special articles.
- Picnic Boxes, Chapatti boxes etc.
- The expanded polystyrene sheets are used for false ceiling and for decorative purpose and in exhibition halls for display of arts and photographs etc.

3. DESIRED QUALIFICATION FOR PROMOTER

The Promoter should have preferably a basic degree in plastic engineering/ processing or a degree/ diploma in engineering / or a degree in chemistry. Experience of at least two to three years in plastic industry is desirable.

4. INDUSTRY OUTLOOK AND TRENDS

The industry outlook for different type of thermocol packaging materials is very encouraging and positive. Considering wide range of applications and in view of overall double digit growth achieved in the plastic and packaging industry as well as the end view sectors, the outlook for thermocol packaging material looks positive. It is estimated that this segment would be achieved above average growth rate compared to the general plastic processing industry.

5. MARKET POTENTIAL AND MARKETING ISSUES, IF ANY

There is a great demand for expanded polystyrene moulded products, and sheets due to increase in the manufacture of electronic equipment, Computers, Audios, TV sets and other products like decorative glass products, instrumentation, Handicraft Products etc.

The great demand for the expanded polystyrene products may be attributed to as an excellent packaging material, which possesses various properties such as lightness, rigidity, shock absorption, internal insulation, resistance to moisture and weathering etc.

The product has a wide range of applications in packaging and in insulation field.

6. RAW MATERIAL REQUIREMENTS

The main raw material required is expanded polystyrene beads which are available indigenously:

- Thermocol sheets
- Moulded components,

7. MANUFACTURING PROCESS

The process involves the following sequence of operations.

The process of moulding expandable polystyrene beads is carried out in three stages

1. Pre-expansion
2. Maturing
3. Moulding

Pre-expansion is achieved by heating the expandable beads in a system which has the dual effect of increasing the pressure of the blowing agent within the beads and of softening the polystyrene.

The pre-expanded beads are allowed to cool, the blowing agent condensing inside the beads, this carries the partial vacuum inside the beads which is thus very weak and during the maturing period air permeates into the bead until equilibrium with the atmosphere is achieved. The mould is filled to the capacity with the pre-expanded beads, and then it is closed and heated by injecting steam. The residual blowing agent and the air which entered the bead during maturing and expands and softens the polystyrene. Since the beads are confined within a closed mould the expansion in the beads causes

them to distort and fill the void space between the beads. Individual beads merging into the mass form a coherent microcellular structure. The mould is then cooled, opened and the article removed.

8. MANPOWER REQUIREMENT

Sr. No.	Particulars	Nos	Salary
1	Production Supervisor	1	8000
2	Accountant	1	10000
3	Office boy cum Store Keeper	1	5000
4	Boiler Attendant	1	5500
5	Manager	1	8000
6	Skilled worker	8	48000
7	Semi-Skilled Worker	12	48000
8	Watchman	1	5000
	Total	26	137500

9. IMPLEMENTATION SCHEDULE

The estimated implementation time for the project would be 12-14 months.

Sr. No.	Particulars	Time Period
1	Preparation of Project report	Two months
2	Sanction of term loan	Three months
3	Selection of Site	Two month
4	Registration and other formalities as Small Scale Unit	One month
5	Procurement of Machinery , erection and commissioning	Four Months
6	Trial Production and commissioning	One Months

10. COST OF PROJECT

Sr. No.	Particulars	Rs. In lakhs
1	Land and Building	25.00
2	Plant and Machinery	20.00
3	Miscellaneous Assets	4.35
4	P & P Expenses	2.20
5	Contingencies @ 10% on land and building and plant and machinery	4.50
6	Working capital margin	12.08
	Total	68.13

11. MEANS OF FINANCE

Sr. No.	Particulars	Rs. (lakhs)
1	Promoter's contribution	20.439
2	Bank Finance	47.691
		68.13

12. WORKING CAPITAL CALCULATION

Sr. No.	Particulars	Rs. lakhs	Stock Period days	Promoter Margin	Margin Amt.	Bank Finance
1	Salaries and wages	1.12	30	1	1.12	-
2	Raw material and packaging material	9.98	30	0.5	4.99	4.99
3	Utilities	0.37	30	0.5	0.185	0.185
4	Debtors	14.46	30	0.4	5.784	8.676
	Total	25.93			12.079	

13. LIST OF MACHINERY REQUIRED

Sr. No.	Particulars	Rs. lakhs
1	Heavy duty auto pre-foaming M/c.	2.6
2	Blower Model CCB/20/3/500 2HP motor	0.4
3	Semi-Automatic shape Mould M/c.	1.80
4	Block Moulding M/c. Manual Type	1.95
5	Vertical slab (Sheet Cutting M/c.)	0.70
6	Trolley Cutting M/c.	0.60
7	Air Compressor - 30 HP	3.00
8	Boiler 1 ton capacity	6.80
9	Sprayer tank 5000 litres capacity 1 HP pump	0.50
10	Water Softening plant	0.55
11	200 kg silo 8'x8'x8' Rs.25000/- each	1.10
	Total	20.00

Major machineries required are manufactured by companies like

- M/s. Shyam Plastic,
- M/s. Konark Plastomac Pvt. Ltd.,
- M/s. Sri Sakthi Engineering,
- M/s.J MK. Industries, etc.

14. PROFITABILITY CALCULATIONS

(Rs.
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Sr. No.	Particulars	Year 1	Year 2	Year 3	Year 4	Year 5
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(A)	Sales Realization per annum	17362300	19842628 .6	22322957. 14	22322957. 14	22322957. 14
(B)	Cost of Production					
1	Raw material per annum	11974000	13684571 .4	15395142. 86	15395142. 86	15395142. 86
2	Utilities	455000	520000	585000	585000	585000
3	Salaries	1650000	1732500	1815000	1815000	1815000
4	Repairs and maintenance	350000	270000	290000	310000	330000
5	Selling expenses (3% on sales value)	520869	595278.8 57	669688.71 43	669688.71 43	669688.71 43
6	Administrative Expenses (other expenses)	450000	540000	630000	720000	810000
	Total	15399869	17342350 .3	19384831. 57	19494831. 57	19604831. 57
(C)	Profit before interest & depreciation	1962431	2500278. 29	2938125.5 71	2828125.5 71	2718125.5 71
	depreciation	675000	675000	675000	675000	675000
	Profit Before term loan and tax	1287431	1825278. 29	2263125.5 71	2153125.5 71	2043125.5 71
	Interest on term loan (11%)	498370.9 5	419680.8	314760.6	209840.4	104920.2
	Profit before tax	789060.0 5	1405597. 49	1948364.9 71	1943285.1 71	1938205.3 71
	Tax (30%)	236718.0 15	421679.2 46	584509.49 14	582985.55 14	581461.61 14
	Total Profit	552342.0 35	983918.2 4	1363855.4 8	1360299.6 2	1356743.7 6

Underlying assumptions for probability calculation are:-

The installed capacity of the plant is assumed at 800 MT per annum. The capacity utilization is taken at 70% for the first year resulting in production and sales of 560 MT of finished products. The raw material price is assumed at Rs. 22/- per KG. The selling price is taken at Rs.31/- per KG. Power cost is taken at Rs.8/- per unit. Interest rate on long term loan is taken at 11%.

15. BREAKEVEN ANALYSIS

Fixed Cost (FC):	Rs. In lakhs
Wages & Salaries	16.5
Repairs & Maintenance	3.5
Depreciation	6.75
Admin. & General expenses	4.5
Interest on Term Loan	4.9
Total	36.15

Fixed Cost: 36.15

Profit After Tax: 5.52

$$\mathbf{BEP = FC \times 100 / FC + P}$$

$$36.15 / 41.67 \times 70 / 100 \times 100$$

60.72%

16. STATUTORY/GOVERNMENT APPROVALS

There is no specific statutory requirement for plastic industry process. However, MSME registration various taxation related registration and labour law related compliances have to be ensured. Entrepreneur may contact State Pollution Control Board where ever it is applicable.

17. BACKWARD & FORWARD LINKAGES

There are no specific backward or forward linkages related techno-economic advantages or synergies for this type of project.

18. TRAINING CENTRE AND COURSES:

There are number of institutions providing facilities and training courses on production/marketing for the proposed project. These are Central Institute of Plastic Engineering and Technology (CIPET), Indian Institute of Packaging Management (IIPM), Plastic and Rubber Institute (PRI), Indo German Tool Room (IGTR), etc.

Udyamimitra portal (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 program helps to run business successfully is also 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.

Source:- Udyami Mitra/Sidbi