

PROJECT PROFILE

ON

THERMOCOLE PACKAGING (EXPANDED POLYSTYRENE FOAM MOULDING)

Month & Year
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**PREPARED BY
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THERMOCOLE PACKAGING

(EXPANDED POLYSTYRENE FOAM MOULDING)

INTRODUCTION:

Expanded Polystyrene (EPS) foam mouldings, due to its high load bearing and shock absorption capacity, are world wide 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.

PRODUCT USES & SPECIFICATIONS:

The expanded polystyrene moulded products are used in packaging application in

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

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

SPECIFICATIONS:

Bureau of Indian Standard has developed standard specifications for expanded polystyrene for thermal insulations purposes.

I.S.4671 - 1984.

MARKET POTENTIAL:

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, VCR, VCD, VCP and other products like decorative glass products, instrumentation 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.

TECHNICAL ASPECTS:

INSTALLED CAPACITY

1) Thermocole Sheets 30 blocks in 8 hrs. (1M x 1M x ½ M Block = 6 kgs.) = 180 kgs per shift in 2 shifts 360 kgs. Production capacity per annum of 300 days = 108 MT.

2) Moulded components average 350 gms per piece. (100 cycles in 8 hours/shift) 35 kg. In 2 shifts 70 kgs. Production capacity per annum 300 days 21 MT.

PLANT & MACHINERY

Particulars	Nos.	Rs.lakhs
1. Heavy duty auto pre-foaming M/c.	1	2.50
2. Blower Model CCB/20/3/500 2HP motor	1	0.40
3. Semi Automatic shape Mould M/c.	1	1.80
4. Block Moulding M/c. Manual Type	1	1.90
5. Vertical slab (Sheet Cutting M/c.)	1	0.70
6. Trolley Cutting M/c.	1	0.60
7. Air Compressor - 30 HP	1	2.80
8. Boiler 1 ton capacity	1	6.80
9. Sprayer tank 5000 litres capacity 1 HP pump	1	0.50
10. 200 kg silo 8'x8'x8' Rs.25000/- each	2	1.10
11. Water Softening plant	1	0.50
Total		19.60

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.

RAW MATERIALS

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

For the installed capacity of the plant of 108 MT of thermocole sheets and 21 MT of moulded components, the requirements of beads works out to $(108+21)+2\%$ waste = 131.58 MT.

Cost of the material

Granules STYROPER per Kg.	Rs.130 (LG Expol)
For 1 MT.	Rs.82000/-
For 131.58 MT	Rs.107.90 lakhs.

LAND & BUILDING:

A factory shed measuring 3000 sqft required taken on rental basis, is sufficient rent Rs. 30000 advance Rs3.00 lakhs.

UTILITIES

Electricity: Power requirement of 50 H.P. is sufficient for operation.

Steam & Fuel: The steam required is 800 kgs per hour. A one tonne boiler is provided in the project.

Water: Water required is 10000 litres per day.

Effluent Treatment: There is no harmful effluent to be discharged in the process.

Man Power Requirement

Category	Nos	Monthly Salary	Total monthly Salary
Skilled workers	8	6000	48000
Unskilled workers	6	4000	24000
Boiler Attendant	2	4000	8000
Helpers	4	4000	16000
Supervisors	2	8000	16000
Manager	1	10000	10000
Accountant/clerk	1	5000	5000
			127000
Add : Benefits	20%		25400
Total			152400
Total wages per annum [Rs. lakhs]			Rs.18.29

IMPLEMENTATION SCHEDULE:

The project can be implemented in two months period, as machinery is available indigenously.

ASSUMPTIONS:

1. The concern will be manufacturing expanded Polystyrene sheets and EPS moulded components.
2. EPS sheet selling price is assumed at Rs.2.00 lakhs per MT and EPS moulded components is assumed Rs.2.20 lakhs per MT.
3. Power charge is calculated for 50 HP for 16 hours @ Rs.5.25 per unit. Rs. 9.40 lakhs per annum (Rs. 78333per month)

4. The cost of material is assumed at Rs. 171.05 lakhs at 100% as per the break given above.
5. Fuel charge is calculated at 800 kgs. Per hour for 16 hours @ Rs.1.50 per Kg. of steam. Rs. 69.00 lakhs Per annum (Rs. 5.75 lakhs per month)
6. Wages and salaries Rs. 18.29 lakhs per annum as per the breakup given above with annual increase 5%.
7. Repairs & Maintenance is assumed at Rs. 0.60 p.a (Rs. 5000 p.m.) with annual increase 5%
8. Depreciation is calculated on Machinery at 15% on WDV method.
9. Administration Expenses is assumed at Rs. 4.80 lakhs pa Rs.40000 pm with annual increase 5%.
10. Interest on Term Loan is calculated at 12% p.a.
11. Interest on working capital finance is calculated at 12% p.a.
12. Income tax is provided at 33.22%.

LIST OF MACHINERY SUPPLIERS

1. M/s Deepthi EPS Machinery Suppliers, House No: 4-70/1 East Gandhi Nagar, Rampally-X Road, Nagaram Post, Kesara Mantapam R.R.District, Hedrabad-500086 Phone 08106907260
2. M/s. Sri Sakthi Engineering, 4, New Gubera Ganapathy Street, Mathiyalagan Nagar, Padi, Chennai - 600050., Contact : Kapali, Phone: 6232559.

LIST OF RAW MATERIALS SUPPLIERS

Polystyrene Granules

1. M/s. Shin-A-Chemicals (India) Ltd., 47, Greams Road, Chennai - 06.
Trade Name: Shinopal
2. M/s. LG Polymers, No.5, Vijay Complex, Nehru Nagar, 2nd Avenue, Anna Nagar, Chennai - 600040. Trade Name: Styromac
3. M/s. BASF, 46, Cathedral Road, Chennai-600086., Trade Name: Styroper

FINANCIAL ASPECTS

1. COST OF PROJECT

	[Rs.lakhs]
Land & Building (Advance)	3.00
Plant & Machinery	19.60
Contingencies	1.00
Other Misc. assets	0.50
Pre-Operative expenses	1.00
Margin for WC	5.50
	30.60

2. MEANS OF FINANCE

Capital	15.15
Term Loan	15.45
	30.60

3. COST OF PRODUCTION & PROFITABILITY STATEMENTS

	[Rs.lakhs]		
Years	1	2	3
Installed Capacity (MT)			
a) EPS Sheets	108	108	108
b) EPS Moulded components	21	21	21
Utilisation	60%	70%	80%
Production/Sales (MT)			
a) EPS Sheets	64.80	75.60	86.40
b) EPS Moulded components	12.60	14.70	16.80
Selling Rate per MT.			
a) EPS Sheets	Rs.2.00 lakhs		
b) EPS Moulded components	Rs.2.20 lakhs		
Sales Value (Rs. lakhs)			
a) EPS Sheets	129.60	151.20	172.80
b) EPS Moulded components	27.72	32.34	36.96
Total Value (Rs. lakhs)	157.32	183.54	209.76
Raw Materials	64.74	75.53	86.32
Power	5.64	6.58	7.52
Fuel	41.40	48.30	55.20
Wages & Salaries	18.29	19.20	20.16
Repairs & Maintenance	0.60	0.66	0.73
Depreciation	3.09	2.63	2.23
Cost of Production	133.76	152.90	172.16
Admin. & General expenses	4.80	5.04	5.29
Selling expenses	0.00	0.00	0.00
Interest on Term Loan	1.85	1.62	1.16
Interest on Working Capital	2.89	2.89	2.89
Total	143.30	162.45	181.50

Profit Before Tax	14.02	21.09	28.26
Provision for tax	4.66	7.01	9.39
Profit After Tax	9.36	14.08	18.87
Add: Depreciation	3.09	2.63	2.23
Cash Accruals	12.45	16.71	21.10

4. WORKING CAPITAL:

	Months Consumptions	Values	%	Margin Amount	Bank Finance
Raw Materials	2.00	10.79	25%	2.70	8.09
Consumables	0.00	0.00	25%	0.00	0.00
Finished goods	0.50	5.57	25%	1.39	4.18
Debtors	1.00	13.11	10%	1.31	11.80
Expenses	1.00	0.10	100%	0.10	0.00
		29.57		5.50	24.07

5. PROFITABILITY RATIOS BASED ON 80% UTILISATION

$\frac{\text{Profit after Tax}}{\text{Sales}}$	=	$\frac{18.87}{209.76}$	9%
$\frac{\text{Profit before Interest and Tax}}{\text{Total Investment}}$	=	$\frac{32.31}{54.67}$	59%
$\frac{\text{Profit after Tax}}{\text{Promoters Capital}}$	=	$\frac{18.87}{15.15}$	125%

6. BREAK EVEN LEVEL

Fixed Cost (FC):

	[Rs.lakhs]
Wages & Salaries	20.16
Repairs & Maintenance	0.73
Depreciation	2.23
Admin. & General expenses	5.29
Interest on TL	1.16
	<u>29.57</u>

Profit Before Tax (P) 28.26

$$\text{BEL} = \frac{\text{FC} \times 100}{\text{FC} + \text{P}} = \frac{29.57}{57.83} \times \frac{80}{100} \times 100$$

41% of installed capacity