

AIR BUBBLE PACKAGING

A. INTRODUCTION:

Air bubble packaging film has gained a good status in packaging field as a convenient and economical cushioning material. Cushioning materials are available in many types and forms. The old traditional wood excelsior and shredded paper or tissue have been supplemented or replaced by corrugated pads. Further sophistication, convenience and improved functional characteristic in cushioning have been achieved by using various types of plastic foams. Most commonly used plastic foam for packaging application is expanded polystyrene.

Air bubble polyethylene film is preferred over expanded polystyrene because it is cost effective. Resiliency of air bubble film is much higher than expanded polystyrene and ultimate volume of package is much lower if air bubble film is used. It is most suitable for packaging of light fragile items, sophisticated electronic goods, calculators etc..

The demand generation of electronic goods in recent years has left wide gap to fulfill the packaging need using air bubble film which has generated a good potential of the project for new entrepreneurs. Besides packaging applications, air bubble film is widely used in developed countries as swimming pool cover.

B. PRODUCT USES & SPECIFICATIONS:

The major area of application may be segregated into the following fields.

1. Packaging of fragile items like crockery etc.
2. Packaging of electronic items.
3. Plastic machinery parts packaging.
4. Precious antiques packaging.
5. Pharmaceutical bottles, vials packaging etc..
6. Some special type of chemical packaging.

SPECIFICATIONS:

Air bubble film is a two layer laminated low density polyethylene film with entrapped air inside, between the two layers in bubble form in some orderly fashion. Air bubbles render cushioning effect. The bubbles may be of different sizes. The size of bubble and thickness of film is decided depending upon the end use (i.e.,) the type and weight of content to be packed.

Air bubble LDPE film has following properties.

1. Excellent water resistance
2. Atmospheric resistance
3. High dielectric properties.
4. Resistance to termite and white ant.
5. Easy and economical packaging process.
6. Very high shock absorption property.
7. Resistant to most acid and alkalis for moderate duration.
8. Light in weight, attractive look, printable, washable and heat sealable.

C. MARKET POTENTIAL:

Packaging industry in India has an estimated turnover of Rs. 11,500 crores, which is growing at the rate of 18 per cent annually. The changing pattern of the Indian Consumer behaviour directly affects the packaging industry as the direct expenditure incurred by companies to make the products attractively packaged is increasing day by day. The industry has a huge potential and it is growing at a rapid pace.

The packaging industry in India, which started way back in the 1950's, has grown slowly and steadily in both quality and quantity. The 70's and 80's witnessed a remarkable change in materials as well as machinery depending on the tastes of the markets.

In the 80's the Indian packaging industry witnessed about four to five percent growth. But after the brand awareness caught on around the 90's the growth

touched 15-20 per cent. This has not only given face-lift to the industry but also opened it up for innovations. In this period, the industry by and large, depended on domestic resources for materials as well as machinery. This was due to various restrictions on imports. Towards the mid 90's, liberalisation opened the industry further and it began to reflect in the changes in consumers' consumption pattern.

Packaging manufacturers are responding with the state of the art solutions such as multi-layer foils, trays, stand bags, PET bottles, lids and closures. Ongoing innovations by the plastics industry help to accommodate these requirements. The major disadvantage of all plastic materials is the fact that they are gas-permeable, whereas glass, tinplate and aluminium offer almost 100 percent protection.

The global market for packaging is worth US \$900 billion and India's share is only US \$3 billion. This itself shows the potential for growth as the economy expands with large consumers in the waiting. If India can increase the penetration level in the global market, the packaging industry can become a fast emerging industry in India. The packaging industry faces a challenge from the ever-growing demands of consumers, who want food to remain fresh longer, as well as being easy to handle, healthy and packaged in environmentally – friendly materials.

D. TECHNICAL ASPECTS:

Installed Capacity :

The capacity envisaged is 1440 MT per annum on the basis of two shifts per day for 300 days. This works out to 10435200 sq.mtrs.

Plant & Machinery

Polycell Bubble Sheet Making machine	Rs. 80.00
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Manufacturing Process :

LDPE granules fed into the hoppers of 100 mm and 75mm extruder respectively pass through the extruders, where they are melted, plasticised and forced through the 2 layer nips of T die. In the die two layers of LDPE sheets of required thickness are

formed simultaneously. These two layers are passed through two silicon synthetic cooling rollers where air bubbles are thermo formed over one roller and simultaneously it is laminated by forcing other layer by pressure. At this point, vacuum forming of bubble, cooling of outer surface of both layers and lamination of thermoformed layer on secondary layer occur simultaneously.

After this the formed layers are cooled and moved forward trimmed and then to the winder through take off rollers and then to winder.

Raw Materials

LDPE granules	1515.6 MT/annum.
Price	Rs.87 per kg.

Land & Building:

Land	20,000 Sq.ft.
Building	4,500 Sq.ft.

Utilities:

Electricity

Power requirement is 373 KW. is sufficient for operation.

For Heaters	222 KW	225 KW
For Motors	174 HP	130 KW
For Misl.	25 HP	18 KW

Total Power	373 KW
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Power Consumed per annum

(373 x 16 hrs x 300 days) = 1790400 KW

Water: Water about 15000 kilo litres is required for process.

Effluent Treatment:

Process does not discharge any harmful effluent. However NOC from Pollution Control Board has to be obtained.

Man Power Requirement:

Category	Nos.	Monthly	Total monthly
Manager	1	10000	10000
Accountant	1	7000	7000
Office Assistant	1	4000	4000
Office Boy	1	2500	2500
Supervisor	4	6000	24000
Skilled	8	4000	32000
Semi skilled	8	3000	24000
Unskilled	12	2500	30000
Maintenance fitter	2	4000	8000
Electrician	2	4000	8000
			149500
Add : Benefits	20%		29900
Total			179400
Total wages per annum [Rs.lakhs]			Rs.21.53 lakhs

7. IMPLEMENTATION SCHEDULE:

The machines are to be imported. The delivery can be done within 6 months. The project can be implemented within 9 months period after arranging building.

8. ASSUMPTIONS:

1. Installed capacity-1440 Mt (10435200 Square metres) per annum
2. Capacity utilization Year 1- 60%, Year 2-70% and Year 3-80%
3. Selling Price Rs.17 per Sq.mt
4. Raw materials at 100 % capacity Rs.1318.57 lakhs
5. Power charges at 100% Rs.89.52 lakhs –Power rate Rs.5.00 per unit
6. Wages & salaries Rs.21.53 lakhs per annum
7. Repairs & Maintenance Rs.2.40 lakhs per annum
8. Admn & general expenses Rs.0.30 lakh per annum
9. Selling expenses 3% on sales value

10. Interest on Term Loan and Working capital finance 12% p.a.
 11. Income tax-33.99 % on profits

FINANCIAL ASPECTS

1. COST OF PROJECT

[Rs.lakhs]

Land 3 acres	2.00
Building	13.50
Plant & Machinery	80.00
Contingencies	8.00
Other Misc. assets	3.00
Pre-Operative expenses	10.50
Margin for WC	60.75
Total	177.75

2. MEANS OF FINANCE

Capital	99.75
Term Loan	78.00
Total	177.75

3. COST OF PRODUCTION & PROFITABILITY STATEMENTS

[Rs.lakhs]

Years	1	2	3
Installed Capacity - MT	1440	1440	1440
- Sqmt.	10435200	10435200	10435200
Utilisation	60%	70%	80%
Production/Sales - MT	864	1008	1152
- Sqmt.	6261120	7304640	8348160
Selling Price per Sqmt.	Rs.17		
Sales Value (Rs.lakhs)	1064.39	1241.79	1419.19
Raw Materials	791.14	923.00	1054.86
Power	53.71	62.66	71.62
Wages & Salaries	21.53	22.61	23.74
Repairs & Maintenance	2.40	2.64	2.90

Depreciation	14.93	12.71	10.84
Cost of Production	883.71	1023.62	1163.96
Admin. & General expenses	3.60	3.78	3.97
Selling expenses	31.93	37.25	42.58
Interest on Term Loan	9.36	8.19	5.85
Interest on Working Capital	28.07	28.07	28.07
Total	956.67	1100.91	1244.43
Profit Before Tax	107.72	140.88	174.76
Provision for tax	36.61	47.89	59.40
Profit After Tax	71.11	92.99	115.36
Add: Depreciation	14.93	12.71	10.84
Cash Accruals	86.04	105.70	126.20

4. WORKING CAPITAL:

	Months	Values	%	Margin	Bank
	Consumptions			Amount	Finance
Raw Materials	2.00	131.86	25%	32.97	98.89
Finished goods	1.00	73.64	25%	18.41	55.23
Debtors	1.00	88.70	10%	8.87	79.83
Expenses	1.00	0.50	100%	0.50	0.00
		294.70		60.75	233.95

6. PROFITABILITY RATIOS BASED ON 80% UTILISATION

<u>Profit after Tax</u>	=	<u>115.36</u>	8%
Sales		1419.19	
 <u>Profit before Interest and Tax</u>	=	<u>208.68</u>	51%
Total Investment		411.70	
 <u>Profit after Tax</u>	=	<u>115.36</u>	116%

Promoters Capital

99.75

7. BREAK EVEN LEVEL

Fixed Cost (FC):

[Rs.lakhs]

Wages & Salaries	23.74
Repairs & Maintenance	2.90
Depreciation	10.84
Admin. & General expenses	3.97
Interest on TL	5.85
	47.30

Profit Before Tax (P) 174.76

$$\text{BEL} = \frac{\text{FC} \times 100}{\text{FC} + \text{P}} = \frac{47.30}{222.06} \times \frac{80}{100} \times 100$$

17% of installed capacity

LIST OF MACHINERY SUPPLIERS

1. M/s.Polyprise Incorporated, No.12, Lane 10, KAO-CHING Road, YANGMEI TOWN TAOYUAN HSIEN, TAIWAN R.O.C., TL 03-4641966 FAX 886-3-4961093
2. M/s.CHI CHANG MACHINERY CO. Ltd., 15F1-1, No164, Sec.5.,Nankmg E. Road, TAIPEI, TAIWAN R.O.C., Tel (02) 761-3251 Fax 886-2-760-4641
3. Konark Plastic Machinery, No.5, Africawala Estate, Behind Chakudia Mahadev, Opp: Comet House, Rakhial, Ahmedabad 380 023.
4. Sunrise Palstic Machinery Mfg, B-21, 22 Ambica Estate, Ahmedabad-382415

RAW MATERIAL SUPPLIERS

1. M/s.Indian Petrochemical Corporation Ltd. (IPCL), (Regional Office), 2nd Floor Temple View Apt., 89, Santhome High Road, R.A.Puram, Chennai - 600 028.
2. M/s.P-P Industries, 91, Stranhans Road, Otteri, Chennai - 600 012.
3. M/s.V.D. Samy & Co. Ltd., 26, Cathedral Road, Chennai - 600 086.
4. Reliance Industries Ltd., 501, JVL Plaza, Anna Salai, Chennai - 600 018.

5. Haldia Pertochemicals Ltd., 41, VN Raod, T.Nagar, Chennai - 600 017.

ALUMINIUM CANS

A. INTRODUCTION:

Packing is not merely a container, it is part of the total system which processes the raw material into a product and delivers through distribution and marketing network to the customer. The needs of the market place today have changed with the ground rules of the packaging design. Packaging adds value to the product by transporting them, by withstanding, by processing, by preserving, by conserving them and by generally protecting products from the time they are made until they are consumed in full.

Aluminium containers are ideal packaging media for delicate and perishable food products as well as other liquid and semi-liquid items like edible oils, paints, lubricants, pesticides etc. Despite increase in production of plastic and other flexible packaging, the demand for tin containers is ever increasing. Aluminium containers have the following advantages: strength, durability, no bad effects on the product, ease in handling without physical damage like breakage, compactness, lightness, no damage by light to contents. The above factors have stimulated the growth of the Aluminium container industry which continues to occupy a place of its own in the total packaging.

B. PRODUCT USES & SPECIFICATIONS:

These types of Aluminium bottle cans are ideally suited for pesticide packing

- This type bottle is used for sampling, for launching various Industrial products and for sale to the consumer.
- Due to the natural appearance of the aluminium and their plain outline, these small bottles are ideally suited for the display of perfumes, eaux de toilette or cosmetics to which a personal touch could be given without much sophistication.

Specifications:

- One-piece body is pure aluminium 99.5%.
- External rolled-on screw neck formed by the sealing of a threaded P.P. Collar-on to the exterior of the neck.
- Closure with plastic screw cap Type EUROPA
- Sealed with tear-off aluminium cap.

C. MARKET POTENTIAL:

The demand estimates of Aluminium containers required for various sectors depend upon the consumption pattern of various products. The consumption of pesticides, insecticides, edible oils, lubricants, paints, baby food products, beverages etc. are on the increase. There is a growth in the consumption of packaging material used as Aluminium containers.

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The packaging industry in India, which started way back in the 1950's, has grown slowly and steadily in both quality and quantity. The 70's and 80's witnessed a remarkable change in materials as well as machinery suiting the tastes of the markets.

In the 80's the Indian packaging industry witnessed about four to five percent growth. But once brand awareness caught on around the 90's the growth touched 15-20 per cent. This has not only give face-lift to the industry but also opened it up for innovations. In this period, the industry by and large, depended on domestic resources for materials as well as machinery. This was due to various restrictions on

imports. Towards the mid 90's, liberalisation opened the industry further and it began to reflect in the changes in consumers' consumption pattern.

Packaging manufacturers are responding with the state-of-the-art solutions such as multi-layer foils, trays, stand bags, PET bottles, lids and closures. Ongoing innovations by the plastics industry help to accommodate these requirements. The major disadvantage of all plastic materials is the fact that they are gas-permeable, whereas glass, tinplate and aluminium offer almost 100 percent protection.

The global market for packaging is worth US \$900 billion and India's share is only US \$3 billion. This itself shows the potential for growth as the economy expands with large consumers in the waiting. If India can increase the penetration level in the global market, the packaging industry can become a fast emerging industry in India. The packaging industry faces a challenge form the ever-growing demands of consumers, who want food to remain fresh longer, as well as being easy to handle, healthy and packaged in environmentally – friendly materials.

D. TECHNICAL ASPECTS:

Installed Capacity :

The installed capacity of the unit is 1000 Aluminium containers of different capacities per day of 8 hours. On this basis the annual installed capacity will be 300000 containers.

Plant & Machinery:

The plant and machinery required are the following.

Particulars	Nos.
Spinning lathe 6'	8
Threading centre lathe	4
100 ML Aluminium container die set.	1
250 ML Aluminium container die set.	1
500 ML Aluminium container die set.	1
1000 ML Aluminium container die set.	1
5000 ML Aluminium container die set.	1

Suguna Brand 3 HP Buffing polisher	3
Total cost of machinery	Rs.15.00 lakhs.

Manufacturing Process :

Aluminium circles of required diameter is pressed in the hydraulic press and a tube form is obtained. The tube is then shaped in the spinning lathe with the help of the dies to form the neck. The neck formatting may be formed to fit pilfer proof cap or can the threaded for fixing screw cap. Then the finished container is polished and dispatched.

Raw Materials :

The material required for manufacturing Aluminium containers is Aluminium circles available from local aluminium re-rollers.

Land & Building:

The building area requirement is about 1000 sq. ft. which can be taken on rental basis.

Utilities:

Electricity: The total power requirement of the unit is 10 HP.

Water: Water is not required for process.

Man Power Requirement:

Designation			Rs./Month	Total
1.	Supervisor	1	6000	6000
2.	Skilled	15	4000	60000
3.	Unskilled	3	3000	9000
4.	Administrative assistants	2	4000	8000
				83000
	Add: Benefits 20%			16600
	Total			99600

	Annually			Rs.11.95 lakhs.
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IMPLEMENTATION SCHEDULE:

The machinery is available locally. They can be supplied within 2 months provided finance is available. The entire project can be implemented within 3 months.

ASSUMPTIONS:

1. The installed capacity is based on 1 litre aluminium containers. This can be increased or decreased depending on time taken to produce smaller or larger containers.
2. Selling price is calculated based on a uniform product of 1 litre container.
Rs.35.00 per container
3. Material cost per 1 litre container is taken for 120 gms weight, which works out to Rs.17.00 per piece inclusive of wastage.
4. Consumables represent machine consumables.
5. Wages and salaries are estimated at Rs.11.95 lakhs per annum.
6. Repairs & Maintenance is calculated at Rs.5000 per month.
7. Depreciation is calculated at 15% on P&M.
8. Administrative & General expenses are calculated at Rs.20000 per month.
9. Selling expenses is calculated at 3% on sales.
10. Interest on Term Loan is calculated at 12% p.a.
11. Interest on Working Capital is calculated at 12% p.a.
12. Income tax is calculated at 33.99% on profits.

LIST OF MACHINERY SUPPLIERS:

1. M/s.Hero Machine Tool, 41/4, Armenian Street, Chennai - 600001.
2. M/s.T.K. Industries, 26, Hoodwharf (Waltax Road), Chennai - 600 079.

LIST OF RAW MATERIALS SUPPLIERS

1. M/s.T.K.Industries, 26, Hood Wharf (Waltax Road), Chennai - 600 079.
- 2.

FINANCIAL ASPECTS

1. COST OF PROJECT

[Rs.lakhs]

Land & Building (Advance)	0.80
Plant & Machinery	15.00
Contingencies	1.00
Other Misc. assets	0.60
Pre-Operative expenses	1.00
Margin for WC	2.59
Total	20.99

2. MEANS OF FINANCE

Capital	8.99
Term Loan	12.00
Total	20.99

3. COST OF PRODUCTION & PROFITABILITY STATEMENTS

[Rs.lakhs]

Years	1	2	3
Installed Capacity (Nos.)	300000	300000	300000
Utilisation	60%	70%	80%
Production/Sales (Nos.)	180000	210000	240000
Selling Price	Rs.35.00per no.		
Sales Value (Rs.lakhs)	63.00	73.50	84.00
Raw Materials	34.20	39.90	45.60
Consumables	1.20	1.26	1.32
Power	0.54	0.63	0.72
Wages & Salaries	11.95	12.55	13.18
Repairs & Maintenance	0.60	0.66	0.73
Depreciation	2.40	2.04	1.73
Cost of Production	50.89	57.04	63.28
Admin. & General expenses	2.40	2.52	2.65
Selling expenses	1.89	2.21	2.52
Interest on Term Loan	1.44	1.26	0.90

Interest on Working Capital	1.27	1.27	1.27
Total	57.89	64.30	70.62
Profit Before Tax	5.11	9.20	13.38
Provision for tax	1.74	3.13	4.55
Profit After Tax	3.37	6.07	8.83
Add: Depreciation	2.40	2.04	1.73
Cash Accruals	5.77	8.11	10.56

4. WORKING CAPITAL:

	Months Consumptions	Values	%	Margin Amount	Bank Finance
Raw Materials	2.00	5.70	25%	1.43	4.27
Finished goods	0.50	2.12	25%	0.53	1.59
Debtors	1.00	5.25	10%	0.53	4.72
Expenses	1.00	0.10	100%	0.10	0.00
		13.17		2.59	10.58

6. PROFITABILITY RATIOS BASED ON 80% UTILISATION

<u>Profit after Tax</u>	=	<u>8.83</u>	11%
Sales		84.00	
<u>Profit before Interest and Tax</u>	=	<u>15.55</u>	49%
Total Investment		31.57	
<u>Profit after Tax</u>	=	<u>8.83</u>	98%
Promoters Capital		8.99	

7. BREAK EVEN LEVEL

Fixed Cost (FC):	[Rs.lakhs]
Wages & Salaries	13.18
Repairs & Maintenance	0.73
Depreciation	1.73
Admin. & General expenses	2.65
Interest on TL	0.90
	19.19
Profit Before Tax (P)	13.38

$$\text{BEL} = \frac{\text{FC} \times 100}{\text{FC} + \text{P}} = \frac{19.19}{32.57} \times \frac{80}{100} \times 100$$

47% of installed capacity

BOPP SELF ADHESIVE TAPES

A. INTRODUCTION:

Packaging in India is a Rs.11,500 crores industry and growing at the rate of 18 per cent annually. The global market for packaging is US \$900 billion and India's share is only US \$3 billion, but while the per capita expenditure on packaging in the US is a whopping US \$125, it is only \$6.5 in India. Therefore, there is a huge potential for growth in the Indian packaging industry.

The packaging industry in India, which started on a low ebb in the 1950's has grown slowly and steadily in both quality and quantity. The 70's and 80's witnessed a remarkable change in materials as well as machinery. This has not only given a face-lift to the industry but also opened it up for innovations. In this period, the industry by and large, depended on domestic resources for materials as well as machinery. This was due to various restrictions on imports. Around the mid 90's, liberalisation opened the industry further and it began to reflect in the changes in consumers' consumption pattern.

B. PRODUCT USES & SPECIFICATIONS:

These tapes are used in electrical insulation purpose, in packaging, sealing and a various other general uses. These tapes are also used for general labelling with printing.

SPECIFICATIONS:

I.S.3434 - 1965 - Glossary of terms for adhesives and pressure sensitive tapes.

I.S.7809(Part I) 1975 - General requirement for pressure sensitive tape.

I.S.7809(Part II) 1977 - Test Methods.

I.S.7809(Part III) 1977 - Requirement for individual materials. Plasticised Polyvinyl adhesive tapes with non-thermo setting adhesives.

The BOPP tape must have smooth surface characteristics, good elongation, soft and flexible to give good conformability, transparency of pigmentation and temperature resistance.

C. MARKET POTENTIAL:

The BOPP Adhesive Tapes are used for packaging. It is consumed daily in large quantities by all industrial and commercial organisations. From packing courier covers and bags to packing of pharmaceutical cartons, everywhere, the self adhesive tapes are consumed. The consumption increases in line with the improved standard of living and business activity in the society. Therefore the consumption of this product is bound to increase further.

D. TECHNICAL ASPECTS:

Installed Capacity:

50 mm width x 65 metres from 1000 mm width BOPP film the production will be 5310000 rolls per annum per shift of 8 hours.

10mm width x 50 metres from 1000 mm width BOPP film, the production will be 34560000 rolls.

The product mix will be 90% of 50 mm width tape and 10% of 10 mm tape per annum of 300 days in one shift. (i.e.,)

a) $5310000 \times 90\% = 4779000$ rolls of 50mm tape.

b) $34560000 \times 10\% = 3456000$ rolls of 10 mm tape.

The plant will work one shift for 300 days.

Plant & Machinery

The plant and machinery required for manufacturing BOPP Self adhesive tapes are the following.

1. Coating machine 40" (1000 mm)	1 No.
2. 1000 mm slitter turret machine with accessories	1 No.
3. Automatic core cutting machine	1 No.
4. Baby slitter 6" (150 mm)	
5. Salvage rewinding machine (Doctor Winder)	1 No.

Manufacturing Process :

The BOPP roll is loaded in the coating machine and adhesive applied on one side. The coated roll is loaded in the slitting machine and the slit tapes wound in the paper core of required width automatically. The paper core of required width is obtained from the automatic core cutting machine by cutting from the long paper core.

Raw Materials

The materials required for manufacturing self adhesive tapes are the following:

12 mm BOPP film in 1000 mm wide rolls.

Weight of BOPP film	17 gm/m ²
Total length required	17280000 meters
Width	1 metre
Total	17280000 sq.metres

i.e., weight of BOPP film 293.76 metres.

$[(17280000/1000) \times (17/1000)]$

Price of BOPP film 12 micron Rs.1.15 lakhs per ton.

Cost of Raw materials Rs.1.15 x 293.76 MT. = Rs.337.82 lakhs.

Other consumables Adhesives & paper spool

Rs.5.00 per 50mm roll.

Rs.1.00 per 10mm roll

Land & Building:

Land ½ acre
Building area required 5000 sq. ft.

Utilities

Electricity: Power requirement is 20 HP.

Water: Water required for human consumption.

Man Power Requirement:

Production		Rs./Month	Rs./Month
1. Manager	1	7000	7000
2. Skilled	2	4000	8000
3. Semi-skilled	4	3000	12000
4. Unskilled	4	2500	10000
5. Accountant	1	4000	4000
6. Supervisors	1	5000	5000
			46000
Add: Benefits 20%			9200
			55200

Say Rs.6.62 lakhs.

7. IMPLEMENTATION SCHEDULE:

The machines are available indigenously. The entire project can be implemented within 2 months.

8. ASSUMPTIONS

1. Installed Capacity-50 MM rolls-4779000 Rolls per annum and 10MM rolls- 3456000 Rolls per annum.

2. Capacity utilization-Year 1-30%,Year 2-40% and Year 3-50%
3. Selling Price 50 MM roll Rs.20.00 per Roll and 10MM roll Rs.10.00 per roll.
4. Raw material cost at 100% Rs.337.82 Lakhs.
5. Consumables Rs.5.00 per 50 mm Roll and Rs1.00 per 10mm roll
6. Power charges at Rs.1.79 lakhs per annum at 100%
7. Wages & salaries at Rs.6.62 lakhs at 100%.
8. Repairs & maintenance at Rs.10000 per month
9. Depreciatin on written down value method.
10. Administration and General expenses atRs.40000 per month.
11. Selling Expenses at 5% on sales.
12. Interest on Term Loan 12% p.a
13. Interest on working capital12%p.a
14. Income tax at 33.99% on profits

LIST OF MACHINERY SUPPLIER

1. M/s.Sainath Engineering Works, 114, 2nd floor Bhandup Industrial Estate, Panalal Silk Mill Compound, LBS Marg Bhandup West, Mumbai - 400 078.
2. Jangir Company, Plot No.33, Gali No.t, Raliway Lineside., Anand Prabat Industrial Area., New Delhi.

RAW MATERIAL SUPPLIERS

1. Jampex Trading Private Limited, 160 Linghi Chetty Street
Chennai-600001
2. Kankaria Enterprises, 44/2 New No:113/1 Dr Alagppa Road
Purasawalakm, Chennai-600 084

3. Reliance Industries Ltd., No.501, JVL Plaza, Anna Salai, Chennai -18.
 4. Haldia Petrochemicals, No.41, V.N.Road, T.Nagar, Chennai 600 017.

FINANCIAL ASPECTS

1. COST OF PROJECT

	[Rs.lakhs]
Land	5.00
Building	30.00
Plant & Machinery	35.00
Contingencies	3.00
Other Misc. assets	1.00
Pre-Operative expenses	3.00
Margin for WC	13.49
Total	90.49

2. MEANS OF FINANCE

Capital	52.99
Term Loan	37.50
Total	90.49

3. COST OF PRODUCTION & PROFITABILITY STATEMENTS

Years	1	2	3
Installed Capacity - BOPP Self Adhesive Tapes			
a) 50 mm rolls Nos.	4779000	4779000	4779000
b) 10 mm rolls Nos.	3456000	3456000	3456000
Utilisation	30%	40%	50%
Production/Sales			
a) 50 mm rolls Nos.	1433700	1911600	2389500
b) 10 mm rolls Nos.	1036800	1382400	1728000
Selling Rate			
a) 50 mm rolls Nos.	Rs.20.00	per roll	
b) 10 mm rolls Nos.	Rs.10.00	per roll	
Sales Value (Rs.alkhs)			
a) 50 mm rolls Nos.	286.74	382.32	477.90
b) 10 mm rolls Nos.	103.68	138.24	172.80
Total Value (Rs.lakhs)	390.42	520.56	650.70
Raw Materials	101.35	135.13	168.91
Consumables	82.06	109.40	136.76
Power	0.54	0.72	0.90
Wages & Salaries	6.62	6.95	7.30
Repairs & Maintenance	1.20	1.32	1.45
Depreciation	9.93	7.50	5.68
Cost of Production	201.70	261.02	321.00

Admin. & General expenses	4.80	5.04	5.29
Selling expenses	19.52	26.03	32.54
Interest on Term Loan	4.50	3.94	2.81
Interest on Working Capital	7.02	7.02	7.02
Total	237.54	303.05	368.66
Profit Before Tax	152.88	217.51	282.04
Provision for tax	51.96	73.93	95.87
Profit After Tax	100.92	143.58	186.17
Add: Depreciation	9.93	7.50	5.68
Cash Accruals	110.85	151.08	191.85

4. WORKING CAPITAL:

	Months Consumptions	Values	%	Margin Amount	Bank Finance
Raw Materials	2.00	16.89	25%	4.22	12.67
Consumables	2.00	13.68	25%	3.42	10.26
Finished goods	0.50	8.40	25%	2.10	6.30
Debtors	1.00	32.54	10%	3.25	29.29
Expenses	1.00	0.50	100%	0.50	0.00
		72.01		13.49	58.52

6. PROFITABILITY RATIOS BASED ON 50% UTILISATION

<u>Profit after Tax</u>	=	<u>186.17</u>	29%
Sales		650.70	
<u>Profit before Interest and Tax</u>	=	<u>291.87</u>	196%
Total Investment		149.01	
<u>Profit after Tax</u>	=	<u>186.17</u>	351%
Promoters Capital		52.99	

7. BREAK EVEN LEVEL

Fixed Cost (FC):	Rs.lakhs		
Wages & Salaries	7.30		
Repairs & Maintenance	1.45		
Depreciation	5.68		
Admin. & General expenses	5.29		
Interest on TL	2.81		
	22.53		
Profit Before Tax (P)	282.04		
BEL = $\frac{FC \times 100}{FC + P}$	=	$\frac{22.53}{304.57}$	x $\frac{50}{100}$ x 100

4% of installed capacity

CORRUGATED BOXES

A. INTRODUCTION

Packing, in a way represents the extent of industrialization of a country. The more industrially advanced , the more advanced is its state of packaging. Estimates indicate that packaging represents 5% of total cost and prevents loses to the tune of 20%. Corrugated boxes have made significant strides in packaging either as a primary pack, secondary pack or as a transport container. Corrugated boxes have successfully replaced other packaging and are now being widely used for packaging fruits, vegetables, canned foods, chemicals, pharmaceuticals, electrical appliances, garments etc.

B. PRODUCT USES & SPECIFICATION

Bureau of Indian Standard has developed the specification of corrugated fibre board Boxes and its tests. The number of specification book is given below:

IS : 2771 (Part 1) – 1977 – Corrugated fibre board boxes (first revision)

IS : 7063 – Test for Corrugated fibre board.

Product Specification :

Corrugated board can be classified as under :

1. Single faced corrugated Board (2 ply)
2. Double faced corrugated Board (3 ply or single wall)
3. Double wall corrugated Board (5 ply or double wall)
4. Triple wall corrugated Board (7 ply)

The Corrugated Boxes have the following advantages:

1. Effective cushioning materials.
2. Light weight (freight advantage)
3. Easy to fabricate
4. Easy for storing
5. Easy for disposal
6. Pilfer-proof

7. No strapping necessary
8. Articles kept dust free after sealing
9. Can be made water resistant
10. Printing & Advertising advantage
11. Desired in Export Market
12. Eliminates dependency on natural wood
13. Recyclable
14. Expedites production due to on line conveyor packing.

Because of the aforesaid qualities, the demand for packing in Corrugated Fibre Board is rapidly growing. The recent survey has revealed that 80% to 85% packing is now being done through corrugated fibre Board..

C. MARKET POTENTIAL

Does paper have a future in the digital age? Ultimately, it is a question best answered by the needs of the consumers, but based on the global demand outlook, consumers still want paper well into the 21 st century. World demand for paper has doubled in the past 20 years and it is forecast to double again by the year 2010.

Per capita consumption of paper & paper board in India at 5 Kg is very low compared to other developing countries like China (17.2 Kg), Brazil (28 Kg) for the year 2000. Therefore, despite the threat of paperless transaction, scope for paper demand appears to be bright. In developed nations it is as high as 152 Kgs per annum.

The challenge for the Indian paper industry to meet the ever-increasing demand of paper, board and newsprint is getting crippled due to shortage of fibres in the country. The future demand of paper is expected to grow from 5.6 MT at present TO 9.5 MT in 2010 and 13 MT in 2015. Demand for cream wove paper and Map litho paper is expected to increase by 7-8%. Demand for different kinds of coated paper has increased by 8% in 2002, duplex board has recorded increase by 6.5%, kraft paper has registered a 6% rise in demand and newsprint an impressive 10%.

A list of the major industries, in which it is extensively used at present, is being give below:

Breweries, Glass-wares, Cigarettes, Pharmaceuticals, Soap & Cosmetics, Biscuits, Milk & Milk products, Tea and Coffee, Hosiery & Footwear, Toys, Photographic Equipments, Textiles and Ready-made Garments, Frozen fish, Electric Goods, Refrigerator, Air-cooler and Fans, Electric Bulbs and Tubes, Hardware, Bicycle & Auto-Parts, Rubber & Rubber products, Stationery, Matches, Defence, Food Preservation Industry, Cashewnut Industry, Synthetic (Man-made) Fibres, Horticulture produce tea, Tobacco & Textile, Apple, Cherry, Grapes etc.

D. TECHNICAL ASPECTS

1. Installed Capacity

The installed capacity of the unit is about 300 MT per annum.

2. Plant & Machinery

The main items of the machinery required for the manufacture of Corrugated Boxes are given below:

1. One 4-Bar Rotary Cutting & Creasing Machine, 75" Size
2. One Eccentric Slotter Machine, 75" Size
3. Two Stitching Machines
 - i) One 36" arm, Angular head
 - ii) One 36" arm, Straight head.
4. One Partition Slotter, Automatic Machine
5. One Single Slotting Machine, 12" Size
6. One Vertical Bending Machine, 62" Size

3. Manufacturing Process

The process of manufacturing boxes or containers constitutes five operations.

1. Slitting or longitudinal Cutting
2. Creasing
3. Slotting
4. Flap or Corner Cutting
5. Stitching

After passing the sheet through these operations, a Box or a Container is ready. Slitting and Creasing operations can simultaneously be carried over a 4-bar Rotary Cutting Machine & Creasing Machine. The trimmed and creased sheet is slotted and flap cut on an Eccentric Slotter Machine. Finally, it is either stitched over a Stitching Machine or glued/taped manually. For Partition boxes, the half slotted boards are used, which can conveniently be produced over a Partition Slotter Machine.

Raw Materials

Materials required for one MT	Required Qty.	Cost per (MT/Kg)	Total Cost per MT
Kraft Paper (MT)	1.03		
Add: Waste (3%)	0.03		
	1.06	33000.00	34980.00
Adhesive (Kgs)	200	5.00	1000.00
Stitching Wire (Kgs)	15	45	675.00
Bundling/Packing Materials (Kgs)	3	47.00	141.00
Total Cost required per MT			36796.00
Annual Production		300 MT	
Annual cost of RM		110.39	lakhs

4. Land and Building

An area of 2000 sq.ft is required for this project. The space can be arranged on lease. The rent is assumed at Rs. 16000 p.m and advance will be about Rs. 1.60 lakhs.

5. Utilities

Power: The power requirement is 15 KW.

Water : Water is required for human consumption only.

Manpower: Labour requirement of the unit is estimated as follows.

Supervisor	1	6000.00	6000.00
Operators - Skilled Workers	6	4000.00	24000.00
Unskilled Workers	10	3000.00	30000.00
Accountant	1	4000.00	4000.00
			64000.00
Salaries per Annum			768000.00
Add: Benefits		20%	153600.00
Total Salaries per Annum			921600.00

6. **Implementation Schedule**

The machines are available from supplier within one month's period. The project can be implemented within a month period.

7. **Assumptions**

- The unit would work for 300 days on single shift basis. The unit can generate 300 MT boxes per annum.
- The selling price is assumed as Rs.52000/- per MT.
- Capacity utilization is assumed at 60%, 70% and 80% for first three years.
- Raw Materials cost is assumed at Rs 110.39 lakhs per annum.
- Power charges works out to Rs.1.80 lahs- per annum.
- Wages & Salaries works out to Rs. 9.21 lakhs per annum.
- Repairs & Maintenance is assumed at Rs.2000 p.m
- Depreciation calculated @ 15% on Plant & Machinery on WDV method.
- Selling, General & administrative expense is estimated at Rs.20,000 per month.
- Interest on TL is provided at 12% p.a. on reducing balance.
- Interest on Working Capital is calculated at 12% p.a.
- Income tax is provided at 33.99% on profit.

1. COST OF PROJECT	Rs. lakhs
Land & Building-Rental Advance (2000 sq.ft)	1.60
Plant & Machinery	14.00
Other Misc. Assets	0.50
Pre-operative exp.	1.50
Margin for Working Capital	15.19
Total	32.79
2. MEANS OF FINANCE	
Capital	22.29
Term Loan	10.50
Total	32.79

3. COST OF PRODUCTION & PROFITABILITY STATEMENT

Year	1	2	3
Installed Capacity (MT)	300.00	300.00	300.00
Utilisation (%)	60%	70%	80%
Production/Sales-MT	180.00	210.00	240.00
Sales Value (Rs. lakhs)	<u>93.60</u>	<u>109.20</u>	<u>124.80</u>
Raw Materials	66.23	77.27	88.31
Consumables	0.22	0.25	0.29
Power	1.08	1.26	1.44
Wages & Salaries	9.22	9.68	10.16
Repairs & Maintenance	0.24	0.25	0.26
Depreciation	2.15	1.83	1.56
Cost of Production	79.13	90.54	102.02
Selling, Adm. & Gen. Expenses	2.40	2.52	2.65
Interest on Term Loan	1.24	1.02	0.74
Interest on Working Capital	1.35	1.35	1.35
Total	84.12	95.42	106.75
Profit Before Tax	9.48	13.78	18.05
Provision for Taxes	3.22	4.68	6.14
Profit After Tax	6.26	9.10	11.91
Add: Depreciation	3.05	2.30	1.73

Total Cash Accruals	9.31	11.39	13.64
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4. ASSESSMENT OF WORKING CAPITAL

		Requirement	%	Margin Amount	Bank Finance
Raw Marerials	1 month	5.52	25%	1.38	4.14
Finished Goods	1/4 month	1.65	25%	0.41	1.24
Debtors	1 month	7.80	25%	1.95	5.85
Expenses	1 month	0.22	100%	0.22	0.00
		15.19		15.19	11.23
				Say Rs.	11.23

5. PROFITABILITY RATIOS BASED ON 80%

<u>Profit Before tax</u>	<u>18.05</u>	14%
Sales	124.80	
<u>Profit before Interest & Tax</u>	<u>20.13</u>	73%
Total Investment	44.01	
<u>Profit after Tax</u>	<u>11.91</u>	94%
Promoters Capital	22.29	

6. CALCULATION OF BREAK EVEN LEVEL

FIXED EXPENSES

Power	1.44
Wages & Salaries	10.16
Repairs & Maintenance	0.26
Depreciation	1.56
Admn. & General Exp.	2.65
Interest in Term Loan	0.74
Total Fixed Expenses Cost(FC)	16.80
Profit Before Tax (P)	16.80

BREAK-EVEN LEVEL $\frac{FC}{FC+P} \times 80\%$

48% of installed capacity

LIST OF MACHINERY SUPPLIERS

1. Micromechanical works, Pune
2. Paper Board Machinery Co., Plot No. 115 DLF, ind. Area faridabad (India)
3. SUN-UP (India) Engineering Industries, 1, Suyog Industrial Estate,
Opp. Vikram Glass, L.B.S Marg, Vikhroli, Bombay-400 079.

DEALERS / MANUFACTURERS OF KRAFT PAPERS

1. M/s. Ballarpur Industries Ltd., 16. Cenatoph Road, Chennai-600018.
2. M/s. Arihant Paper & Boards, 80, Vellalar Street, Chennai-600058.
3. Besant Paper House, 64(New 90), Narayana Mudali Street, Chennai-600079.
4. Several other paper dealers in Anderson Street & Bunder Street, Chennai-600001.

JUTE BAGS (Shoppers Bags)

A. INTRODUCTION:

Despite the introduction of many other materials for sacks, bags, pouches and other carry bags, the importance of jute bags and sacks has remained as ever. Of late, being environment friendly, bio-degradable and ecologically harmless in nature, these jute bags are increasingly used in common life. The domestic usage and exports are going up and they are commonly used as shopping bags. There is an increased demand as bags are sturdy. The common carry bags can be manufactured with jute as the main material either with lamination or without lamination.

B. PRODUCT USES & SPECIFICATIONS:

Bureau of Indian Standards has prescribed ISI standards for ordinary jute bags only.

C. MARKET POTENTIAL:

Shoppers bags made of jute attractively printed are widely used for carrying articles. They are durable and biologically disposable. They can carry heavy articles. The demand for shopping jute bags is increasing due to necessity of restricting the usage of plastics.

Packaging in India is a Rs.11500 crores industry and growing at the rate of 18 per cent annually. The global market for packaging is US \$900 billion and India's share is just US \$3 billion, but while the per capita expenditure on packaging in the US is a whopping US \$85, it is only \$5 in India. Therefore, there is a huge potential for growth in the Indian packaging industry.

The packaging industry in India, which started on a low ebb in the 1950's has grown slowly and steadily in both quality and quantity. The 70's and

80's witnessed a remarkable change in materials as well as machinery. This has not only given a face-lift to the industry but also opened it up for innovations. In this period, the industry by and large, depended on domestic resources for materials as well as machinery. This was due to various restrictions on imports. Around the mid 90's, liberalisation opened the industry further and it began to reflect in the changes in consumers' consumption pattern.

Another factor which has been helping the industry is the Jute Packaging Act 1987. This Act stipulated compulsory use of jute bags for package of food-grains, sugar, fertilisers and cement for a specified proportion of their dispatches. This was a protection offered by the government to the crisis ridden industry to overcome a part of their marketing problems on account of the threat posed by the more economic options made available by the petrochemicals sector.

D. TECHNICAL ASPECTS:

Installed Capacity:

The installed capacity of the unit proposed is 150000 jute bags per annum. This is based on a production of 500 bags per shift of 8 hours per day.

(Size - 19" x 15')

Plant & Machinery:

The plant and machinery required for manufacturing shoppers bags are the following.

Sl	Particulars	Nos.	Rs.
1	Fabric Cutting Machine	1	6000
2	Heavy Duty Sewing Machine	1	25000
3	Ordinary sewing machine	3	7000
4	Stencil Equipments for printing colouring paints		10000

5 Other Misc. equipments	2000
Total	50000

Manufacturing Process:

The process of manufacturing of shoppers bags consists of the following.
 Purchase of white quality jute in rolls - Laminating with LDPE/HDPE if required on job work basis - Cutting with cutting knives - Stitching with heavy duty stitching machines

Raw Materials:

The raw material required for jute bag is jute fabric in rolls. From one roll (200 metres x 1.2 metres) of jute fabric 400 bags of 19" x 15" size can be manufactured. Production envisaged per annum of 300 days working is 150000 bags.

Jute fabric required per annum -- 375 rolls of 200 metres each

Rate per metres		Rs.25.00
Total cost of fabric	=	375 rolls x 200 mt. x Rs.25.00
	=	Rs.18.75 lakhs

Land & Building:

Building required 200 sq. ft. Rented.

Utilities:

Electricity: Power requirement is 2 HP.

Water : Water is not required for process.

Man Power Requirement:

Production		Rs./Mont h	Total
1. Workers	3	3000	9000
			9000
Add: Benefits 20%			1800
	Total		10800

Annually

Rs.1.30 lakh.

7. IMPLEMENTATION SCHEDULE:

The machines are available from the suppliers indigenously. The project can be implemented within one month's period.

8. ASSUMPTIONS

1. The installed capacity is 150000 Jute bags per annum. (size -19"X 15")
2. The capacity utilization assumed is 60% in first year, which will be increased to 70% and 80% in subsequent years.
3. Selling price per bag is assumed at Rs.16.00 per bag.
4. The raw material cost at 100% capacity is Rs.18.75 lakhs.
5. The cost of power charges at 100% is Rs.0.24 lakh per annum.
6. Wages and salaries is assumed at Rs.1.30 lakh per annum.
7. Repairs & maintenance is provided at Rs.0.12 lakh per annum.
8. Depreciation is provided on written on value method.
9. Administration and General expenses is provided at Rs.0.60 lakh per annum.
10. Selling expenses is provided at 2% on sales
11. Interest on term loan is calculated at 12% per annum.
12. Income tax is calculated at 33.99% on taxable profits.

LIST OF MACHINERY SUPPLIERS:

1. M/s.Veesew Machines (P) Ltd., 11, Thiruvalluvar Street, Villivakkam,

Chennai - 600049.

2. M/s.Sagar Overseas Pvt. Ltd., 632, Annasalai, Chennai - 600006.

JUTE RAW MATERIALS SUPPLIERS

1. M/s.Jute Service Centre, 34, Medavak Tank Road, Kilpauk,Chennai - 10.

The above mentioned organisation provide training to the entrepreneurs for starting jute bag manufacturing units.

JUTE BAG PRINTING

1. Sarah Jute Bag Printers, 486, T.H.Road, Tondiarpet, Chennai - 600081.

2. M/s.Bengal Trading Co., 28, Audiappa Naicken Street, Chennai-600001.

3. Hind Industrial Corporation, 35/19, Waltax Road, Chennai - 600079.

4. Sakaria Jute Corporation,192, Govindappa Naicken Street, Chennai - 01.

1. COST OF PROJECT	Rs. lakhs
Land & Building (Advance)	0.20
Equipment & Furniture	0.50
Contingencies	0.05
Other Misc. assets	0.20
Pre-Operative expenses	0.30
Margin for WC	0.20
Total	1.45

2. MEANS OF FINANCE

Capital	1.04
Term Loan	0.41
Total	1.45

3. COST OF PRODUCTION & PROFITABILITY STATEMENTS

Years	1	2	3
Installed Capacity (Nos.)	150000	150000	150000
Utilisation	60%	70%	80%
Production/Sales (Nos.)	90000	105000	120000
Selling Rate	Rs.16.00		
Sales Value (Rs.lakhs)	14.40	16.80	19.20
Raw Materials	11.25	13.13	15.00
Power	0.14	0.17	0.19
Wages & Salaries	1.30	1.37	1.44
Repairs & Maintenance	0.12	0.13	0.14
Depreciation	0.14	0.10	0.08
Cost of Production	12.95	14.90	16.85
Admin. & General expenses	0.60	0.63	0.66
Selling expenses	0.29	0.34	0.38
Interest on Term Loan	0.06	0.05	0.04
Interest on Working Capital	0.00	0.00	0.00
Total	13.90	15.92	17.93
Profit Before Tax	0.50	0.88	1.27
Provision for tax	0.00	0.00	0.43
Profit After Tax	0.50	0.88	0.84
Add: Depreciation	0.14	0.10	0.08
Cash Accruals	0.64	0.98	0.92

4. WORKING CAPITAL:

	Months	Values	%	Margin	Bank
	Consumptions			Amount	Finance
Expenses	1.00	0.20	100%	0.20	0.00
		0.20		0.20	0.00

6. PROFITABILITY RATIOS BASED ON 80% UTILISATION

<u>Profit after Tax</u>	=	<u>0.84</u>	4%
Sales		19.20	
<u>Profit before Interest and Tax</u>	=	<u>1.31</u>	90%
Total Investment		1.45	
<u>Profit after Tax</u>	=	<u>0.84</u>	81%
Promoters Capital		1.04	

7. BREAK EVEN LEVEL

Fixed Cost (FC):		Rs. lakhs	
Wages & Salaries		1.44	
Repairs & Maintenance		0.14	
Depreciation		0.08	
Admin. & General expenses		0.66	
Interest on TL		0.04	
		2.36	
Profit Before Tax (P)		1.27	
BEL	$\frac{FC \times 100}{FC + P}$	$= \frac{2.36}{3.63}$	$\frac{80}{100} \times 100$
=			

52% of installed capacity

LAMINATED FLEXIBLE PACKAGING

A. INTRODUCTION:

Packaging industry in India has an estimated turnover of Rs.11,500 crore, which is growing at the rate of 18 per cent annually. The changing pattern of the Indian Consumer behaviour directly affects the packaging industry as the direct expenditure incurred by companies to make the products attractively packaged is increasing day by day. The industry has a huge potential and it is growing at rapid pace.

The packaging industry in India, which started way back in the 1950's, has grown slowly and steadily in both quality and quantity. The 70's and 80's witnessed a remarkable change in materials as well as machinery depending on the tastes of the markets.

In the 80's the Indian packaging industry witnessed about four to five percent growth. But once brand awareness caught on around the 90's the growth touched 15-20 per cent. This has not only given face-lift to the industry but also opened it up for innovations. In this period, the industry by and large, depended on domestic resources for materials as well as machinery. This was due to various restrictions on imports. Around the mid 90's, liberalisation opened the industry further and it began to reflect in the changes in consumers' consumption pattern.

Packaging manufacturers are responding with state of the art solutions such as multi-layer foils, trays, stand bags, PET bottles, lids and closures. Ongoing innovations by the plastics industry help to accommodate these requirements. The major disadvantage of all plastic materials is the fact that they are gas-permeable, whereas glass, tinplate and aluminium offer almost 100 percent protections.

The global market for packaging is worth US \$900 billion and India's share is just US \$3 billion. This itself shows the potential for growth as the economy expands with large consumers in the waiting. If India can increase the penetration level in the

global market, the packaging industry can become a fast emerging industry in India. The packaging industry faces a challenge from the ever-growing demands of consumers, who want food to remain fresh longer, as well as being easy to handle, healthy and packaged in environmentally – friendly materials.

B. PRODUCT USES & SPECIFICATIONS:

The major products using laminated packaging are processed food and convenience food, refill packs for malted products like Bournvita, coffee, tea, bakery products like biscuits, confectionery, fruit juice concentrates, products like pan parag, spices, toiletries, premium soap wrappers, shampoo sachets etc.

C. MARKET POTENTIAL:

Compared to other pack forms, flexible packaging is particularly cost effective and environmentally positive because of its light weight. In recent years, the introduction of “state-of-the-art” in-line printing, laminating and cooling operations has enabled the tailoring of structures to meet specific requirements of individual products so providing the best possible packaging solutions for consumer goods, especially food products.

Ready meals are offered for sale in three formats – frozen, chilled and shelf-stable. Each of these types has different packaging requirements.

Frozen food inherently has a long shelf life (in the freezer) and requirement of packaging is that it should contain the product and keep it clean. In addition there is the need for it to be capable of being used as the container in which the food is reheated.

Chilled foodstuffs have a relatively short shelf - life and are therefore packed in low or medium barrier materials. Traditionally, shelf stable meals have been made by the in-pack processing of pre-packed foodstuffs. The method normally used in the retort process where the food and packaging together are processed at temperatures above 100 deg C, usually 121 deg C and sometime as high as 130 deg C. After such processing the ready meal (for example) has a shelf - life of one or two year under ambient conditions.

Traditionally, fruit juices and dairy products such as milk and cream have been aseptically packed, that is sterilized at a lower temperature. The packaging materials are similarly sterilized, for example by the use of a peroxide wash and products are then packed in microbiologically clean environment. The shelf-life under ambient conditions thus depends on the product/packaging barrier combination.

New food processing now becoming available includes the ohmic process of APV which sterilizes the food prior to packing and is likely to be developed to allow the use of substantial sized particulate to be present in the products offered.

However, more recently, aluminium foil lid has largely been replaced by plastics – based materials for microwave use where, with appropriate selection, the lid materials can withstand the temperatures achieved. Also approved for food contact use under these conditions, these materials can produce a cost saving as no splash guard is needed if the lid is pierced before re-heating and only removed when the hot food is ready to serve.

Flexible Packaging has become a major factor in the distribution of products throughout the world. Its role is the result of the ability to combine the properties of various materials through the process of laminating. For example aluminium foil is an excellent barrier to water vapour, gases and light but is not heat sealable and in gauges thinner enough to be economically feasible for packaging and does not have strength. When laminated to paper and to plastic film the barrier properties can be exploited while the other substratum contribute strength, puncture resistance, stiffness and heat sealability.

The function of packaging is to provide the product protection against gain or loss of components or changes in the product as a result of external forces. The primary barriers considered are water, vapour, odours, flavourants and light. Barrier properties can be designed into lamination to the degree necessary to provide product protection while minimising the cost and consistent with the physical properties needed to function properly on packaging machinery and through distribution.

Laminated materials have really picked up and the total market potential is around 80,000 TPA with an annual growth of 15 to 20%. With the growth of self service stores and consumer awareness for pilfer proof well protected and presented products, the growth of laminates can be marketed with confidence.

Processed food is another sector of high volume consumption. The Government estimated production of processed food of a value of Rs.14,000 crores, which would require about 40,000 TPA of packing materials in the form of co-extruded films and laminates.

D. TECHNICAL ASPECTS:

Installed Capacity

The envisaged capacity proposed is 100 Mts. per annum.

Width of machine 48" (122 cm) 1.2 m

Speed - 600 metres per hour

Production per hour - 720 sqmt.

Weight of Lamination - 60 GSM (Average)

Production per day 8 hours = 346 kgs. (720 x 60 x 8 = 346 kgs.)

For 300 days - 103800 kgs.

Assumed as - 100 MT.

Plant & Machinery

Film lamination machine	5.00
Flexo printing machine	4.00
Streo making press	2.00
Rollers of different sizes	1.00
Total	12.00

Manufacturing Process :

Dry Bond (Adhesive) Lamination:

PET (Polyster) + Adhesive + Metalised Polyster + PET (Polyster).

This method used for bonding two impervious web consists of applying the adhesive to the inside face of two webs. This process is very suitable for the laminations of plastic films to other substrates. The application of adhesive to the film surface by a gravure roller and combined in the pressure up roller and taken to the wind in rollers, with uniform tension and free of creases folds and wrinkles and ensuring both the ends are exactly parallel and not telescoping. After lamination the flexible web sheets are printed in Flexographic printing machine.

Raw Materials:

For manufacturing of aluminium foil and Polyster bases laminates the following raw materials are required.

1. Metallised Polyster Film
2. Non Metallised Polyster Film
3. Low density Polyethylene
4. Paper or any other laminatable sheet.

All raw materials are available indigenously.

A typical material mix for one MT of laminate can be described below.

Average cost per MT of Flexible Laminated Sheets

	Qty.	Rate/Kg.	Value (Rs.)
Metalised Polyster	32 kgs.	Rs.190	6080
Clear Polyster	240 kgs.	Rs.144	34560
Co-ex film	610 kgs.	Rs.90	54900
Adhesive	55 kgs.	Rs.200	11000
Solvent for adhesive	45 kgs.	Rs.60	2700
Inks	164 kgs.	Rs.210	34440
Solvents per ink	70 kgs.	Rs.15	1050
Total			144730

Rate per kg. Rs.144.73/-

Land & Building: 1500 Sqft. Covered area. This can be on rental basis.

Utilities

Electricity : Power requirement of 15 H.P. is sufficient for operation.

Water : Water is not required for process.

Man Power Requirement:

Production		Rs./Month	Rs./Month
1. Manager	1	6000	6000
2. Skilled	4	4000	16000
3. Unskilled	2	3000	6000
4. Admn. assistants	2	4000	8000
			36000
	Add: Benefits 20%		7200
	Total		43200

7. IMPLEMENTATION SCHEDULE:

The machines are indigenously available. The delivery can be done within 2 months. The project can be implemented within 3 months' period if finance is made available.

8. ASSUMPTIONS

- The installed capacity is 100 MTs of Laminated Flexible Packaging per annum.
- The capacity utilization assumed is 60% in first year , which will be increased to 70% and 80% in subsequent years.
- Selling price per Metric Tonne is assumed at Rs.1.80 lakhs.
- The raw material cost at 100% capacity is Rs.144.73 lakhs.
- The cost of power charges at 100% is Rs.1.35 lakh per annum.
- Wages and salaries is assumed at Rs.5.18 lakhs per annum.
- Repairs & maintenance is provided at Rs.0.60 lakh per annum.
- Depreciation is provided on written on value method.

- Administration and General expenses is provided at Rs.2.40 lakh per annum.
- Selling expenses is provided at 3% on sales
- Interest on term loan and working capital finance is calculated at 12% per annum.
- Income tax is calculated at 33.99% on taxable profits.

FINANCIAL ASPECTS

1. COST OF PROJECT

	Rs. Lakhs
Land & Building (Advance)	1.20
Plant & Machinery	12.00
Contingencies	0.60
Other Misc. assets	1.00
Pre-Operative expenses	1.00
Margin for WC	5.71
Total	21.51

2. MEANS OF FINANCE

Capital	12.06
Term Loan	9.45
Total	21.51

3. COST OF PRODUCTION & PROFITABILITY STATEMENTS

Years	1	2	3
Installed Capacity (MT)	100	100	100
Utilisation	60%	70%	80%
Production/Sales (MT)	60	70	80
Selling Rate per MT.	Rs.1.80lakhs		
Sales Value (Rs.lakhs)	108.00	126.00	144.00
Raw Materials	86.84	101.31	115.78
Power	0.81	0.95	1.08
Wages & Salaries	5.18	5.44	5.71
Repairs & Maintenance	0.60	0.66	0.73
Depreciation	1.89	1.61	1.37
Cost of Production	95.32	109.97	124.67
Admin. & General expenses	2.40	2.52	2.65
Selling expenses	3.24	3.78	4.32
Interest on Term Loan	1.13	0.99	0.71

Interest on Working Capital	2.63	2.63	2.63
Total	104.72	119.89	134.98
Profit Before Tax	3.28	6.11	9.02
Provision for tax	1.11	2.08	3.07
Profit After Tax	2.17	4.03	5.95
Add: Depreciation	1.89	1.61	1.37
Cash Accruals	4.06	5.64	7.32

4. WORKING CAPITAL:

	Months Consumptions	Values	%	Margin Amount	Bank Finance
Raw Materials	2.00	14.47	25%	3.62	10.85
Finished goods	0.50	3.97	25%	0.99	2.98
Debtors	1.00	9.00	10%	0.90	8.10
Expenses	1.00	0.20	100%	0.20	0.00
		27.64		5.71	21.93

6. PROFITABILITY RATIOS BASED ON 80% UTILISATION

<u>Profit after Tax</u>	=	<u>5.95</u>	4%
Sales		144.00	
<u>Profit before Interest and Tax</u>	=	<u>12.36</u>	28%
Total Investment		43.44	
<u>Profit after Tax</u>	=	<u>5.95</u>	49%
Promoters Capital		12.06	

7. BREAK EVEN LEVEL

Fixed Cost (FC):	[Rs.lakhs]
Wages & Salaries	5.71
Repairs & Maintenance	0.73
Depreciation	1.37
Admin. & General expenses	2.65
Interest on TL	0.71
	11.17
Profit Before Tax (P)	9.02

$$\text{BEL} = \frac{\text{FC} \times 100}{\text{FC} + \text{P}} = \frac{11.17}{20.19} \times \frac{80}{100} \times 100$$

44% of installed capacity

LIST OF MACHINERY SUPPLIERS

1. M/s.Yenyeskey Machine Tools, Near J.M. Hospital, Thadagam Road
Coimbatore 641025.
2. M/s.Anjana Machinery Mfg. Pvt. Ltd., 206, Udyog Bhavan, Sharma Industrial
Estate, Goregaon East, Mumbai - 400063.
3. M/s.J.D. Enterprises, 16, Syed Amir Ali Avenue, Calcutta - 700017.

RAW MATERIAL SUPPLIERS

Metallised Film & Polyester Film:

1. SPICK India Pvt. Ltd., 91/C4, Govindappa Naicken Street, Chennai 600 001.
2. M/s.Venlon Polymers Limited, Hosur.
3. M/s.Garware Plastic Pvt. Ltd., 19, Casa Major Road, Egmore, Chennai 600 008
4. M/s Annamalaiar Platics, 26, Chinnathambi Mudali Street, Chennai 600 001

PAPER BAGS AND POUCHES

INTRODUCTION

Of late, owing to the increased awareness of biologically non-disposable nature of the plastics bags, the plastic carrybags are being banned in many cities and urban centres. The disposal and recycling of plastic bags have created havoc and a threat to the environment. Suitable solution to come out of this difficulty is to replace, wherever possible, plastic bags with other bio-degradable materials such as paper bags, cotton bags, jute bags etc., Considering the necessity to solve this problem there is an immediate demand for paper carrybags, which can be made in different sizes and thicknesses.

PRODUCT USES & SPECIFICATIONS

Paper carrybags are used in all types of trade. Some of them are the following.

- Textile Shops
- Bakeries
- Shoe / Chappal Shops
- Grocery Shops
- Fancy Shops
- Book Shops
- Sweet Shops
- Meat / Fish Shops
- Vegetable Shops
- Stationery Shops
- Hardware Shops
- All departmental shops & consumer shops

The Bureau of Indian Standards has not prescribed any standards for paper carry bags. IS:1060-1996 parts 1 to 3 deal with methods of sampling and testing and allied products for various tests, such as bursting strength, tensile strength etc.

MARKET POTENTIAL

Does paper have a future in the digital age? Ultimately, it is a question best answered by the needs of the consumers, but based on the global demand outlook, consumers still want paper well into the 21st century. World demand for paper has doubled in the past 20 years and it is forecast to double again by the year 2010.

Per capita consumption of paper & paper board in India at 5 Kg is very low compared to other developing countries like China (17.2 Kg), Brazil (28 Kg) for the year 2000. Therefore, despite the threat of paperless transaction, scope for paper demand appears to be bright. In developed nations it is as high as 152 Kgs per annum.

The challenge for the Indian paper industry to meet the ever-increasing demand of paper, board and newsprint is getting crippled due to shortage of fibres in the country. The future demand of paper is expected to grow from 5.6 MT at present TO 9.5 MT in 2010 and 13 MT in 2015. Demand for cream wove paper and Maplitho paper is expected to increase by 7-8%. Demand for different kinds of coated paper has increased by 8% in 2002, duplex board has recorded increase by 6.5%, kraft paper has registered a 6% rise in demand and newsprint an impressive 10%.

Current world production of paper is of the order of 283 million tonnes. The per capita consumption of paper is 45 kg. Developing countries average at 12 kg per annum and developed countries at 152 kg per annum.

Paper is an eco-friendly product. It is made from natural raw materials and as an end product, paper is bio-degradable. Paper has no real competing product. Plastic which was rated as a substitute for paper has lost the race, being non bio-degradable.

Electronic media, which was considered a threat to the growth of the print media, has not dampened the growth of paper usage by the print media. Thus there seems to be no barrier for growth of the paper industry. Among the regions, Asia is expected to record the highest rate of growth.

There are certain products for which market demand is always accelerated. Paper bag is also one of such products. In view of Government's proposal for banning plastic bags and pouches, the demand for paper bags and pouches is bound to increase manifold. There is export potential for export of paper bags & pouches. The consumption of paper boards used in packaging industry has been increasing.

A. TECHNICAL ASPECTS

PRESENT PROJECT

The project proposed is to manufacture paper carry bags. With the machineries proposed from indigenous sources about 10,000 bags of different sizes can be manufactured per hour.

For this proposed project calculation, on a conservative basis 5000 bags per hour is taken as capacity. The total capacity providing on single shift basis is assumed at 40000 bags. The capacity per annum is 120,00,000 bags.

SIZES OF BAGS

The maximum size bags, which can be manufactured by the machine, are the following:

Paper bags (Flat Type)	:	8cm X 12cm (3.2" X 4¾") to 50cm X 50cm (20" X 20")
Paper bags (Sachet type)	:	8cm X 2cm X 12cm (3.2" X 0.8" X 4.8") to 50cm X 12cm X 50cm (20" X 4.8" X 20")

Paper Carry bags : by fixing the Bottom Board,

Handles : All the above sizes

(Eyeletting & tag fixing manual)

The bags may be plain style colour or double colour printed.

PLANT & MACHINERY

The machinery consists of the following:

Fully Automatic Special type paper bag making unit with the following attachments & accessories.

- a) Single Slit Slitting unit to size the paper from big width to small width to produce small bags with 3 HP Motor
- b) Double Colour Flexo printing unit with attachment
- c) 3 HP Motor for Main drive
- d) 12 Nos Flat type size plates and , 12 Nos Sachet type size plates
- e) 48 Nos Size Gear Wheels
- f) 12 Nos Stereo rollers
- g) One bag cutting machine
- h) Eye letting Machine
- i) The total cost of the above Plant & Machinery works out to Rs. 7.00 Lakhs from reputed indigenous manufacturer

MANUFACTURING PROCESS

The whole process involved in the manufacture of paper bags is automatic, starting with printing and ending with stacking up of finished bags. The paper roll is initially cut into proper width and they are fed into the printing unit first. After the printing is done the roll goes into the bag making section where it is folded, pasted, sheared and stacked. The bags will be plain bags or sachetted bags with folds in the middle.

RAW MATERIALS CALCULATION (FOR 120 LAKHS BAGS)

The paper bags can be manufactured from different varieties of papers ranging from 44 GSM (Grams per Square Metre) to 160 GSM with Burst Factor ranging from 2 to 30. Besides Kraft paper, Wrapper paper, Art paper, Butter paper, Wax coated paper also can be used to manufacture paper bags. The following working is related to a particular size namely 36cm X 40cm with a centre width of 120 GSM Kraft paper.

Kraft Paper 120 GSM		Qty.	Rate	Value
For Bag Size 36cm X 40cm X width 9 cm		MT		Rs. Lakhs
Requirement per Bag in gms.	53			
Add : Wastage 5%	gms. 3			
	gms 56	672	33000	221.76
Glue	Re.	0.03	per Bag	3.60
Printing Ink	Re.	0.20	per Bag	24.00
Eyelets	Re.	0.03	per Bag	3.60
Cotton Tag	Re.	0.07	per Bag	8.40
	For	120 lakhs	Bags	261.36
Raw Materials Cost per Bag			Rs.	2.18

3. Raw Materials cost is assumed at Rs. 2.18 per bag as per calculations furnished.
4. Power charges works out to Rs. 2500 per month.
5. Wages & Salaries works out to Rs.4.75 lakhs per annum.
6. Repairs & Maintenance is assumed at Rs. 3000 p.m
7. Depreciation calculated @ 15% on Plant & Machinery on WDV method.
8. Admn. Expenses is assumed at Rs. 20000 p.m.
9. Selling expenses are assumed at Rs1.08 lakhs during first year.
10. Interest on TL is provided at 12% p.a. on reducing balance.
11. Interest on WC is provided at 12% p.a.
12. Income tax is provided at 33.99% on profit.

MACHINERY SUPPLIERS

1. M/s. Yenyeskey Machine Tools, SF No. 362, Thadagam Road (Next to JM Hospital),
Coimbatore-641025. Phone: (0422) 402228 / 434288.
2. M/s. Jandu Engineering Works (Regd.), R-31, Vikas Marg, Shakarpur, Delhi-
110092. Phone: (011) 2247671.

DEALERS / MANUFACTURERS OF KRAFT PAPERS

1. M/s. Ballarpur Industries Ltd., 2-B, 24, CNC Road, Chennai-600105.
2. M/s. Seshasayee Paper & Board Mills Ltd., Pallipalayam Cauvery PSPO, Erode.
3. M/s. Arihant Paper & Boards, 80, Vellalar Street, Chennai-600058.
4. Besant Paper House, 64(New 90), Narayana Mudali Street, Chennai-600079.
5. Several other paper dealers in Anderson Street & Bunder Street, Chennai-
600001.

COST OF PROJECT **Rs. lakhs**

Land & Building-Rental Advance	0.56
Plant & Machinery	7.00
Other Misc. assets	0.50
Pre-op. expenses	0.35
Working Capital Margin	4.48
Total	12.89

MEANS OF FINANCE

Capital	7.64
Term Loan	5.25
Total	12.89

COST OF PRODUCTION & PROFITABILITY STATEMENT

Year	1	2	3
Installed Capacity (No. of bags-in lakhs)	120.00	120.00	120.00
Utilisation (%)	60%	70%	80%
Production/Sales-lakh bags.	72.00	84.00	96.00
Selling Rate	Re. 2.40	per bag	
Sales Value (Rs. lakhs)	<u>172.80</u>	<u>201.60</u>	<u>230.40</u>
Raw Materials	156.82	182.95	209.09
Power	0.30	0.35	0.40
Wages & Salaries	4.75	4.99	5.24
Repairs & Maintenance	0.36	0.38	0.40
Depreciation	1.18	0.89	0.66
Cost of Production	163.41	189.55	215.78
Administration & Gen. Expenses	2.40	2.52	2.65
Selling Exp.	1.08	1.26	1.44

Interest in Term Loan	0.48	0.36	0.27
Interest on Working Capital	0.93	0.93	0.93
Total	168.30	194.62	221.07
Profit Before Tax	4.50	6.98	9.33
Provision for Taxes	1.53	2.37	3.17
Profit After Tax	2.97	4.61	6.16

ASSESSMENT OF WORKING CAPITAL

		Requirement	%	Margin	Bank
		Amount		Finance	
Raw Marerials	1/2 month	6.53	25%	1.63	4.90
Finished Goods	1/4 month	3.40	25%	0.85	2.55
Debtors	1/2 month	7.20	25%	1.80	5.40
Expenses	1 month	0.20	100%	0.20	0.00
		17.34		4.48	12.85
				Say Rs.	12.85

CALCULATION OF BREAK EVEN LEVEL

SALES @ 80%	230.40
LESS: VARIABLE EXPENSES	
Raw Materials	209.09
Power	0.40
Selling Exp.	1.44
Interest on Working Capital	1.54
	212.47
CONTRIBUTION	17.93

FIXED EXPENSES

Wages & Salaries	5.24
Repairs & Maintenance	0.40
Depreciation	0.66
Admn. & General Exp.	2.65
Interest in Term Loan	0.27
	9.21
PROFIT	8.72
BREAK-EVEN LEVEL	41%
CASH BREAK EVEN LEVEL	38%

PROFITABILITY RATIOS BASED ON 80%

<u>Profit Before tax</u>	<u>8.72</u>	
Sales	230.40	4%
<u>Profit before Interest & Tax</u>	<u>10.53</u>	41%
Total Investment	25.70	
<u>Profit after Tax</u>	<u>5.76</u>	75%
Promoters Capital	7.64	

THERMOCOLE PACKAGING

(EXPANDED POLYSTYRENE FOAM MOULDING)

A. 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 instal. 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.

B. 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.

C. 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.

D. 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.lakh
1. Heavy duty auto pre-foaming M/c.	1	2.60
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	1.95
5. Vertical slab (Sheet Cutting M/c.)	1	0.70
6. Trolley Cutting M/c.	1	0.60
7. Air Compressor - 30 HP	1	3.00
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	0.55
Total		20.00

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.130000/-
For 131.58 MT	Rs.171.05 lakhs.

Land & Building:

A factory shed measuring 3600 sq. ft required taken on rental basis, is sufficient.

Utilities

Electricity: Power requirement of 60 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

	Production		Rs./Month	Total Salary p.m. (Rs)
1.	Skilled workers	8	4000	32000
2.	Semi-skilled workers	12	3000	36000
3.	Boiler Attendant	2	3000	6000
4.	Helpers	4	2500	10000
5.	Supervisors	2	5000	10000
6.	Manager	1	8000	8000
7.	Accountant/Clerk	2	4000	8000
				110000
	Add: Benefits 20%			22000
		Total		132000

7. IMPLEMENTATION SCHEDULE:

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

8. ASSUMPTIONS:

1. The Unit 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 at Rs.2.20 lakhs per MT.
3. Power charge is calculated for 60 HP for 16 hours @ Rs.5.00 per unit.
4. Fuel charge is calculated at 400 kgs. Per hour for 16 hours @ Rs.1.50 per Kg. of steam.
5. Repairs & Maintenance is assumed at Rs.5000 p.m.
6. Depreciation is calculated on Machinery at 15% on WDV method.
7. Admn. Expenses is assumed at Rs.20000 p.m.
8. Interest on Term Loan is calculated at 12% p.a.
9. Interest on working capital finance is calculated at 12% p.a.
10. Income tax is provided at 33.99%.

LIST OF MACHINERY SUPPLIERS

1. M/s.Sri Sakthi Engineering, 4, New Gubera Ganapathy Street, Mathiyalagan Nagar, Padi, Chennai - 600050., Contact : Kapali, Phone: 6232559.
2. M/s.JMK. Industries, 27/1, Sunderar Street, TMP. Nagar, Padi, Chennai-50.

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)	2.88
Plant & Machinery	20.00
Contingencies	2.00
Other Misc. assets	0.50
Pre-Operative expenses	1.00
Margin for WC	7.21
Total	33.59

2. MEANS OF FINANCE

Capital	17.09
Term Loan	16.50
Total	33.59

3. COST OF PRODUCTION & PROFITABILITY STATEMENTS

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	102.63	119.74	136.84
Power	6.44	7.52	8.59

Fuel	17.28	20.16	23.04
Wages & Salaries	15.84	16.63	17.46
Repairs & Maintenance	0.60	0.66	0.73
Depreciation	3.30	2.81	2.38
Cost of Production	146.09	167.52	189.04
Admin. & General expenses	2.40	2.52	2.65
Interest on Term Loan	1.98	1.73	1.24
Interest on Working Capital	3.50	3.50	3.50
Total	153.97	175.27	196.43
Profit Before Tax	3.35	8.27	13.33
Provision for tax	1.14	2.81	4.53
Profit After Tax	2.21	5.46	8.80
Add: Depreciation	3.30	2.81	2.38
Cash Accruals	5.51	8.27	11.18

4. WORKING CAPITAL:

	Months Consumptions	Values	%	Margin Amount	Bank Finance
Raw Materials	2.00	17.11	25%	4.28	12.83
Consumables	0.00	0.00	25%	0.00	0.00
Finished goods	0.50	6.09	25%	1.52	4.57
Debtors	1.00	13.11	10%	1.31	11.80
Expenses	1.00	0.10	100%	0.10	0.00
		36.41		7.21	29.20

6. PROFITABILITY RATIOS BASED ON 80% UTILISATION

<u>Profit after Tax</u>	=	<u>8.80</u>	4%
Sales		209.76	
<u>Profit before Interest and Tax</u>	=	<u>18.07</u>	29%
Total Investment		62.79	
<u>Profit after Tax</u>	=	<u>8.80</u>	51%
Promoters Capital		17.09	

7. BREAK EVEN LEVEL

Fixed Cost (FC):	[Rs.lakhs]
Wages & Salaries	17.46
Repairs & Maintenance	0.73
Depreciation	2.38
Admin. & General expenses	2.65

Interest on TL

1.24

24.46

Profit Before Tax (P)

13.33

BEL = $\frac{FC \times 100}{FC + P}$

=

24.46

x

80

x

100

37.79

100

52% of installed capacity