

## **HDPE/LLDPE SYNTHETIC PAPER**

### **1. INTRODUCTION**

Synthetic papers are ones, which couple the characteristics of plastics and paper. Generally speaking, synthetic paper is obtained by processing synthetic polymers, as the prime material, into paper like substrate intended for end uses. Typical synthetic paper is the one, which has many of the visual and tactile properties of paper, particularly those papers used for writing or printing applications or those used for bags and wrappings.

Synthetic papers are such substrates which retain the plastic characteristics such as non-tearability, water, weather, stain and termite resistance, excellent folding endurance, good barrier to water vapour and gases, good printability and in certain cases, heat sealability also. Additionally, these synthetic papers provide the benefits of normal paper, viz. writability, printability, appearance, feel, whiteness, opacity etc.

The synthetic papers are versatile and generally can be scored, sheet, die-cut, embossed, foil stamped, stitched, perforated, coated, laminated, etc. Its excellent printability, optical, physical and thermal properties coupled with above stated versatility, render the synthetic papers, the right choice for specific value added applications. They find use mainly for their novelty, durability and performance.

### **2. MARKET POTENTIAL**

The demand for synthetic paper is increasing day by day in view of making envelopes for despatch of magazines, books etc. Because of its strength, good printability, weather resistance, synthetic papers/envelopes are preferred. They are also used for making posters, banners, sign boards etc.

### **3. BASIS & PRESUMPTIONS**

- (i) The output capacity is taken as 36 kgs./hr. The unit will work at 20 hrs. per day for 25 working days in a month and 300 days in a year. The

output capacity may vary from machinery and the cost of machinery may also vary from supplier to supplier.

- (ii) The time period for achieving the full envisaged capacity utilisation is six months.
- (iii) The labour wages are as per the prevailing rates in the market
- (iv) The rate of interest for fixed and working capital is taken as 12 percent
- (v) The margin money requirement for this project is 30 per cent
- (vi) The pay back period of this project is 5 years
- (vii) The rate of land is taken @ Rs.500/- per sq.mtr. and construction charges are taken @ Rs.3500 per sq.mtr. this may also vary from place to place.
- (viii) The present profile has to be updated taking into prevailing cost of land, building, machinery etc. at the time of implementation of the project.
- (ix) 3% material loss has been considered for calculating raw material requirement.

#### **4. IMPLEMENTATION SCHEDULE**

The time requirement for preparation of Project Report	:	Two months
Time requirement for selection of Site	:	One month
Time required for registration as Small Scale Unit	:	One week
Time required for acquiring the loan		
Machinery procurement, erection and commissioning	:	Three months
Recruitment of labourer etc.	:	One month
Trial runs	:	One month

#### **5. TECHNICAL ASPECT**

## MANUFACTURING PROCESS

### 1. Blown/Cast Films

Either monolayer or multilayer films are produced out of this processing Technique. Generally, polymers like LLDPE, HDPE, PS, HIPS and even PVC are used to produce synthetic papers by this process. Fillers such as calcium carbonate, titanium dioxide, silica, china clay, etc. are used to render the polymers receptive to inks and coatings. In certain cases, polymer blends/alloys are used to enhance the printability.

### 2. Monoaxial Orientation

In this process, a thick sheet either mono or multilayered is extruded over a chill roll and then stretched 3-6 times in the machine direction. Polymer mainly used in this process is polypropylene though HDPE can also be used. Advantages of this process are that maximum amount of fillers and pigments can be loaded. By certain unique techniques, micro voids can also be incorporated into the bulk of the film.

### 3. Monoaxial Orientation followed by Coating and Stretching

This combines two operations – orientation and coating. The basic technology includes extruding a polymer containing fillers such as clay, talc, barium sulphate, gypsum, zinc oxide into a thick sheet in the machine direction to about 5-6 times. Over the monoaxially oriented film, a blend of polymers, fillers and pigments is coated either by calendaring or extrusion on one or both surfaces. This step may or may not be preceded by an anchor coat for better adhesion of the coated layer onto the base layer. After coating, the coated laminate is subjected to orientation in the transverse direction. Thus

the base layer is biaxially oriented while the surface layer is monoaxially oriented.

Printable and physical properties of synthetic papers produced by this process are excellent and also possess high tear initiation strength, stiffness, good dimensional stability, less elongation. Optical properties such as opacity, whiteness are also good. Disadvantages are comparatively high production cost and limitation on minimum possible thicknesses.

Other processes are Baxial Orientation, Coating, Cross Lamination etc.

**5. QUALITY & STANDARD**

The Synthetic Paper may be manufactured as per the standard specification specified by the Customers.

**6. PRODUCTION CAPACITY (Per Annum)**

- (a) Quantity (M.T.) : 210
- (b) Value (Rs.) : 2,20,50,000.00

**7. TOTAL POWER REQUIREMENT**

Total connected load (KW) : 40

**8. POLLUTION CONTROL MEASURES**

The unit does not create any pollution. However, a proper ventilation should be made in the processing area for the better circulation of the fresh air.

**9. ENERGY CONSERVATION**

Entrepreneurs may select energy efficient machinery and proper planning has also to be made for saving energy in the unit.

**10. FINANCIAL ASPECT**

A. FIXED CAPITAL

i) Land & Building:    Area Sq.Mtrs.    Rate per Sq.mtr.

Value (Rs.)

Land	500	300	
1,55,000.00			
Building	170	3500	
5,95,000.00			
		Total:	----- 7,45,000.00 -----

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ii) MACHINERY & EQUIPMENT

Sr.No.    Description of machines    Qty. (Nos.)    Value

(Rs.)

(a) Production Unit			
i) Extrusion Blown Film Plant (45 mm)			16,00,000.00
ii) Cooling Tower			2,00,000.00
	54		
iii) Compressor			3,00,000.00
iv) Scrap Grinder			1,00,000.00
(b) Testing Equipment & Other Accessories			
1,00,000.00			
(c) Electrification & Installation @ 10% of cost & machinery (a) & (b)			
1,70,000.00			

(d) Pre-operative expenses		
50,000.00	Total cost of machinery & equipment (a to d)	
19,20,000.00		
(e) Cost of Moulds & Dies		50,000.00
(d) Cost of Office Equipment/Furniture/Computers etc.		
2,30,000.00		
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	Total:	
22,00,000.00		-----

Total Fixed Cost (I + II) = 7,45,000 + 22,00,000 =  
29,45,000.00

WORKING CAPITAL

i) Staff and Labour (P.M.)

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Designation (Rs.)	Nos.	Salary (Rs.)	Total
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Production Engineer/ 20,000.00 Manager	01	20,000.00	
Sales Executive	02	10,000.00	
20,000.00			
Accountant	01	10,000.00	
10,000.00			
Store Keeper-cum-Clerk	01	8,000.00	
8,000.00			
Watchman	03	3,000.00	
9,000.00			
Supervisor	03	6,000.00	
18,000.00			

Skilled Workers	03	4,000.00
12,000.00		
Unskilled Workers	06	3,000.00
18,000.00		

Add perquisite @ 10% of the salary  
11,500.00

Total: 1,26,500.00

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Or Say Rs.

1,26,000.00

ii) Raw Material (P.M.)    Qty.(Tons)    Rate Rs./MT  
(Rs.)

HDPE/LDPE Granules	18.	75,000
13,50,000.00		

iii) Utilities (per month):  
(Rs.)

i) Power  
60,000.00  
(60% utilization x 40 KW x 500 hrs. x Rs.5 per unit)

ii) Water  
5,000.00

Total: 65,000.00

(Rs.) iv) Other Contingent Expenses (per month)

a) Repairs and Maintenance  
4,000.00

b) Transportation charges 5,000.00

c) Postage and stationery	2,000.00
d) Telephone/Fax/Computer	
2,000.00	
e) Consumable Stores	
2,000.00	
f) Advertisement & Publicity	
5,000.00	
g) Insurance	4,000.00
h) Miscellaneous Expenses	1,000.00
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Total:	25,000.00
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**11. TOTAL WORKING CAPITAL (PER MONTH)**

(Rs.)

i) Staff and Labour	1,26,000.00
ii) Raw Material	
13,50,000.00	
iii) Utilities	65,000.00
iv) Other Contingent Exp.	
25,000	
	-----
Total:	15,66,000.00
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Working Capital for 3 months	46,98,000.00

**12. TOTAL CAPITAL INVESTMENT**

A. Fixed Capital	
29,45,000.00	
B. Working Capital for 3 months	46,98,000.00
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Total:	76,43,000.00

### 13. FINANCIAL ANALYSIS

A. Cost of Production (per year) (300 days)

(a) Total Recurring Cost

1,87,92,000.00

(b) Depreciation on building @ 5%

29,750.00

(c) Depreciation on machinery & equipment @ 10%

1,92,000.00

(d) Depreciation on Dies & Moulds @ 20%

10,000.00

(e) Depreciation on office equipment @ 20%

46,000.00

(e) Interest on total Capital Investment @ 12%

9,17,160.00

Total:

1,99,86,910.00

Or Say Rs.:

1,99,87,000.00

B. Sales/Turn over (per year)

<u>Item</u>	<u>Qty.(MT)</u>	<u>Rate (MT)</u>	<u>Value</u>
<u>(Rs.)</u>			

HDPE/LLDPE	210	1,05,000	
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2,20,50,000.00

Synthetic Paper

C. Net Profit (per year)

Sales (Rs.) -	Cost of Production (Rs.)	=	Profit
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(Rs.)

2,20,50,000	-	1,99,87,000	=
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20,63,000.00

$$D. \quad \text{Net Profit Ratio} = \frac{\text{Net Profit} \times 100}{\text{Sales}}$$

$$= \frac{20,63,000 \times 100}{2,20,50,000}$$

$$= 9.82\%$$

$$E. \quad \text{Rate of Return} = \frac{\text{Net Profit} \times 100}{\text{Total Capital Investment}}$$

$$= \frac{20,63,000 \times 100}{76,43,000}$$

$$= 26.7\%$$

F. Break-even Point

Fixed Cost (Per Year) Rs.

a) Depreciation on Building @ 5%

29,750.00

b) Depreciation on Machinery & Equipment @ 10%

1,92,000.00

c) Depreciation on Moulds/Dies & Office

50,000.00

Equipment @ 20%

d) Insurance

48,000.00

e) Interest on total capital investment

9,17,160.00

f) 40% of salary and wages

6,04,800.00

g) 40% of other contingent expenses  
1,00,800.00

Total: 19,48,510.00

Or Say Rs. 19,49,000.00

Net Profit (Per Year)

$$\begin{aligned} \text{B.E.P. \%} &= \frac{\text{Fixed Cost} \times 100}{\text{Fixed Cost} + \text{Net Profit}} \\ &= \frac{19,49,000 \times 100}{19,49,000 + 20,63,000} \\ &= \frac{19,49,000 \times 100}{40,12,000.00} \\ &= 48.6\% \end{aligned}$$