

## **COTTON YARN DYEING**

### **1. INTRODUCTION:**

Most textiles, whether in the form of garments or made ups, are used in color. Very few products are used in the natural grey shade. The process of applying color, also called dyeing, can be done at fiber, yarn, beam, and fabric or garment stage depending on the desired end effect.

### **2. PRODUCT & ITS APPLICATION:**

If the objective is to achieve uniform color all over the fabric or on the entire garment or made-up then the fabric or garment or made up article itself is dyed with a single color. Yarn dyeing is done to achieve stripes, checks or other pattern in the knit or woven fabric. Dyed yarn is extensively used in shirts, dress material, bed linen, sweaters, sports goods and home furnishing. It is also used in small quantities for making small designs, patterns, patches etc. on variety of garments, cloth bags and several other articles.

### **3. DESIRED QUALIFICATIONS FOR PROMOTER:**

Graduate in any discipline. However, a degree in Chemistry or Chemical Engineering would help.

### **4. MARKET POTENTIAL AND MARKETING ISSUES, IF ANY:**

Traditional composite mills had in-house dyeing facilities. However, textile manufacturers have now been focusing on their core competence of spinning, weaving, knitting or processing as stand-alone operations. Industrial buyers use large

quantities of cotton yarn for varied applications. Many of them need yarn in light, medium and dark shades for knitting or weaving different products. Use of dyed yarn of different colors not only helps them come up with creative designs or patterns, it also eliminates the need for one more process of fabric or garment printing. Therefore, many knitting or weaving mills buy dyed yarn or get their yarn dyed on job work basis.

## **5. RAW MATERIAL REQUIREMENTS:**

The main raw material is dye. Cotton being a cellulosic fiber requires Direct, Reactive, Vat, Sulfur or Azoic dyes. Color, fastness, uniform appearance and cost are the key parameters for selection of dyes. Vat dyes are expensive but offer good wash and light fastness while reactive dyes are increasingly used because of cost advantage. Since dyeing process uses large quantity of water, some water softening chemicals are also required. Dyes of different colors and qualities are available in all industrial cities.

## **6. MANUFACTURING PROCESS:**

Cotton yarn is packed by the spinning mills in hank or cone form. Hank yarn can be dyed in the hank form itself by placing it in dye bath. Yarn on the cones needs to be rewound into soft cones to ensure dye penetration in the inner layers of the yarn. Original grey yarn is therefore wound on collapsible spring tubes in cheese winder to prepare soft packages. These tubes are kept on the pegs of dye chamber wherein dye reaches inner layers of the yarn. Dyeing cycle requires yarn to be kept in dye for certain period of time at a certain temperature depending on type of dye used and shade required. After dyeing, the excess water is removed and hank / soft cones dried completely. Yarn on collapsible cones is rewound on paper cones in a winding machine and packed in bags or cartons.

## 7. MANPOWER REQUIREMENT:

The enterprise requires 31 employees as detailed below:

Sr. No.	Designation of Employees	Monthly Salary ₹	Number of employees required	Annual cost ₹. in lacs
	<b>Variable Labour / Workers:</b>			
1	Skilled workers	12,000	7	10.08
2	Helpers	8,000	11	10.08
	<i>sub-total</i>		18	20.16
	<b>Fixed Staff Costs:</b>			
1	Dye House Manager	40,000	1	4.80
2	Commercial Executive	20,000	1	2.40
3	Marketing Executive	20,000	1	2.40
4	Lab / ETP Technician	15,000	2	3.60
5	Stores / warehouse Assistant	15,000	2	3.60
6	Accounts Executive	20,000	2	4.80
7	Production Supervisor	20,000	1	2.40
8	Security / Peon / Driver	10,000	3	3.60
	<i>sub-total</i>		13	27.60
	<b>Total</b>		31	47.76

## 8. IMPLEMENTATION SCHEDULE:

The project can be implemented in 3 months' time as detailed below:

Sr. No.	Activity	Time Required ( <i>in months</i> )
1	Acquisition of premises	1.00
2	Construction (if applicable)	-
3	Procurement & installation of Plant & Machinery	3.00
4	Arrangement of Finance	2.00
5	Recruitment of required manpower	2.00
	Total time required ( <i>some activities shall run concurrently</i> )	3.00

## 9. COST OF PROJECT:

The project shall cost ₹ 152.14 lacs as detailed below:

Sr. No.	Particulars	₹ in Lacs
1	Land	-
2	Building	-
3	Plant & Machinery	111.50
4	Furniture, Electrical Installations	12.50
5	Other Assets including Preliminary / Pre-operative expenses	11.25
6	Margin for Working Capital	16.89
	<b>Total</b>	<b>152.14</b>

## 10. MEANS OF FINANCE:

Bank term loans are assumed @ 60% of fixed assets. The proposed funding pattern is as under:

Sr. No.	Particulars	₹ in Lacs
1	Promoter's contribution	70.99
2	Bank Finance	81.15
	<b>Total</b>	<b>152.14</b>

## 11. WORKING CAPITAL CALCULATION:

The project requires working capital of ₹ 27.69 lacs as detailed below:

Sr. No.	Particulars	Gross Amt.	Margin %	Margin Amt.	Bank Finance
1	Inventories	61.88	40%	24.75	37.13
2	Receivables	18.00	40%	7.20	10.80
3	Overheads	9.69	100%	9.69	-
4	Creditors	-61.88	40%	-24.75	-37.13
	<b>Total</b>	27.69		16.89	10.80

## 12. LIST OF MACHINERY REQUIRED:

The key machinery is the dyeing machines for hank and cones. In addition, the project shall need a boiler, water softening facility, material handling equipment, a laboratory etc. details of important machinery is given below:

Sr. No.	Particulars	UOM	Qty.	Rate (₹)	Value (₹ in Lacs)
	<b>Plan &amp; Machinery / equipments</b>				
<b>a)</b>	<b>Main Machinery</b>				
i.	Dye Bath for Hank Yarn	Nos.	2.00	5,00,000	10.00
ii.	Pressure Dye Machine for cones	Nos	1.00	40,00,000	40.00
iii.	Boiler	Nos	1.00	10,00,000	10.00
iv.	Cheese winders (30 spindles)	Nos	1.00	5,00,000	5.00
v	Rewinder (Indigenous) (30 sp)	Nos	1.00	20,00,000	20.00
vi.	Water Softening Plant	Nos	1.00	5,00,000	5.00
<b>b)</b>	<b>Ancillary machinery</b>				
i.	Hoist	Nos	1.00	1,00,000	1.00
ii.	Trolleys	LS	1.00	2,00,000	2.00
iii.	Washing machine	Nos	3.00	1,00,000	3.00
iv.	Material handling equipments	LS	1.00	3,00,000	3.00
v.	Laboratory Equipments	LS	1.00	5,00,000	5.00
vi.	Pollution control Equipment	LS	1.00	7,50,000	7.50
	<i>sub-total Plant &amp; Machinery</i>				<b>111.50</b>
	<b>Furniture / Electrical installations</b>				
a)	Office furniture	LS	1.00	1,00,000	1.00
b)	Storage system	LS	1.00	2,00,000	2.00
c)	Electrical installations	LS	1.00	5,00,000	5.00
d)	Computers	Nos	3.00	1,50,000	4.50
	<i>sub total</i>				<b>12.50</b>
	<b>Other Assets</b>				
a)	Rent Deposits		2.00	1,87,500	3.75
b)	Delivery Van	Nos	1.00	7,50,000	7.50
	<i>sub-total Other Assets</i>				<b>11.25</b>
	<b>Total</b>				<b>135.25</b>

### 13. PROFITABILITY CALCULATIONS:

Sr. No.	Particulars	UOM	Year-1	Year-2	Year-3	Year-4	Year-5
1	Capacity	%	60%	70%	80%	90%	100%
2	Sales	₹ in Lacs	542.70	633.15	723.60	814.05	904.50
3	Raw Materials & Other direct inputs	₹ in Lacs	491.53	573.45	655.37	737.29	819.21
4	Gross Margin	₹ in Lacs	51.17	59.70	68.23	76.76	85.29
5	Overheads except interest	₹ in Lacs	58.13	58.13	58.13	58.13	58.13
6	Interest	₹ in Lacs	10.33	10.33	10.33	10.33	10.33
7	Depreciation	₹ in Lacs	9.92	9.92	9.92	9.92	9.92
8	<b>Net Profit before tax</b>	₹ in Lacs	<b>-27.21</b>	<b>-18.68</b>	<b>-10.15</b>	<b>-1.63</b>	<b>6.90</b>

### 14. BREAKEVEN ANALYSIS:

The project shall reach cash break-even at 79.83% of projected capacity as detailed below:

Sr. No.	Particulars	UOM	Value
1	Sales Realization	₹. In Lacs	904.50
2	Variable costs	₹. In Lacs	818.73
3	Fixed costs incl. interest	₹. In Lacs	68.46
4	$BEP = FC/SR-VC \times 100 =$	% of sales	79.83%