

Cotton Yarn Dyeing

PRODUCT CODE	: N.A.
QUALITY AND STANDARDS	: As per IS 1670 :1970 IS 1671:1977 IS 8014 :1983
MONTH AND YEAR OF PREPARATION	: May, 2003
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INTRODUCTION

The art of dyeing is a branch of applied chemistry in which a use of both physical and chemical principle is made in order to bring about a permanent Union between the dyes and the textile material. For dyeing the cotton yarn in various shades, the art lies in colouring the textiles in such a manner that the colour may be fast or may not ordinarily be removed by such operations as working, rubbing, sunlight etc. to which the textiles are usually subjected. The dyeing can only take place when the dyeing is in solution/or finely divided or dispersed condition and the fibres are subjected to this dye in solution condition and then this dye being rendered insoluble or fixed by same means. There must exist same marked physico-chemical affinity between the fibres and the dye, which would naturally

depend upon the respective properties of both. The dyed cotton yarn is used in the following fields.

1. Ready-made garments
2. Hosiery industries
3. Bag closing industry
4. Sports goods
5. Umbrella and carpet making
6. Book binding
7. Handloom textiles
8. Furnishing textiles

MARKET POTENTIAL

Despite the marked inroads of synthetic fibres into the textile industry, cotton continues as a major textile fibre. At present, cotton constitutes 78 percent of the total fibre consumed by the textile industries. There is demand for cotton dyeing units as the consumption of cotton textiles has increased. The

proposed purchase grey yarn from the mills and can be dyed and sold in the market. There is also possibility to take up the job work from the mills and dye the yarn on as per their requirement. Since there are large number of textile mills in Maharashtra state there would not be any problem in getting sufficient work for such type of units. Besides this there is good scope for exporting the dyed yarn to foreign countries.

BASIS AND PRESUMPTIONS

- The project profile has been prepared on the basis of single shift of 8 hours each day, 25 days in a month and at 75% efficiency.
- It is presumed that in the 1st year the capacity utilisation will be 70% followed by 85% in the next year and 100% in the subsequent years.
- The rates quoted in respect of salaries and wages for skilled workers and others are the minimum rates in the State/ neighbouring states.
- Interest rate for fixed and working capital has been taken @ 14% on an average, whether financed by bankers or by financial corporation.
- Margin money required is minimum 30% of the projected investment.
- Pay Back period of the project :
After the initial gestation period of one and a half years, it will require 5 years to pay back the loans.
- The rental value of the workshed and other built up/covered area has been taken at the rate of Rs. 20 per square meter.
- The rates quoted in respect of machines, equipment and raw materials are those prevailing at the time of preparation of this project profile, and are likely to vary from supplier to supplier and place to place. When a tailor made project profile is prepared necessary changes are to be made.
- Working capital for 3 months has been taken into consideration for smooth running of the project.

IMPLEMENTATION SCHEDULE

<i>Sl.No. Activity</i>	<i>Period</i>
1. Preparation of the Project Report:	
(a) Calling quotations	1 month
(b) Preparation	2 weeks
2. Provisional Registration as SSI	1 week
3. Financial arrangements	3 months
4. Purchase and procurement of machinery	2 months
5. Installation of machine	1 month
6. Electrification	1 month
7. Recruitment of staff and workers.	1 month

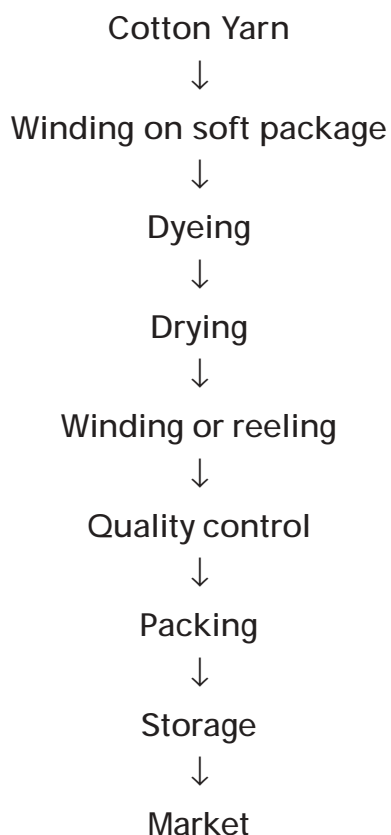
TECHNICAL ASPECTS

Process of Manufacture

The most popularly used colours for cotton dyeing are Aurammic G. victoria blue, brilliant green crystals, rhodamine yellow G, rhodamine dye blue, melachite green etc. The class of dye used depends on the end use, colour and shade required, quality desired and the process adopted. However direct, reactive and mordant dyes are the most common classes of dyes used in the

industry. The grey yarn which may be in the form of hand or solution to penetrate in the yarn. These soft cheeses are creeled on to stand and then loaded in to the machine chamber. Then the dye bath is prepared containing the requisite amount of dyestuff and other chemicals like alum, soda etc. The yarn packages are subjected to high temperature high pressure dyeing for 30 minutes to 1½ hour. The packages are removed from the chamber, excess dye solution is washed and finally dried. The different methods practiced in the industry are given below:

Process flow diagram for Dyed cotton yarn



Quality Control and Standards

The cotton yarn is dyed as per the requirements of the owner. The quality of the dyeing depends on the class of

dye, process, method and the condition of the machines used and also on the hardness of the water used. If the water is hard it is to be treated using salt which will dissolve the Calcium and Magnesium salt present in the water. The following BIS specifications are available.

1. IS 1670 : 1970
2. IS 1671 : 1977
3. IS 8014 : 1983

Production Capacity (per annum)

Quantity : 2000 Kgs. per day or 6,00,000 Kgs.

Value : Rs. 270 lakhs processing charges.

Motive Power

A total of 50 kW or 70 HP power is required to run at full capacity and this can be drawn from state electricity boards.

Pollution Control

In the textile dyeing industry, considerable amount of polluted water is discharged from which harmful chemicals should be neutralised before leaving them into the drainage system. The use of various toxic chemicals and chemical based dyes may be avoided/reduced. The units should not use rice-husk and rubberised material as a fuel in dyeing unit. The smoke of this is very harmful for the human beings. This type of unit should only be started in an area where the common effluent plant facilities are available or the unit installed this type of facilities in the unit's premises to avoid any health hazards.

Energy Conservation

Another important international aspect of the recent period is energy conservation. The energy conservation will make the industries to reduce their production costs and thereby stay more competitive in the market. This matter should be the concern of every person involved in the day to day operations of any industry. Idle running of various machines, heaters, boilers, lights, fans, air conditioners etc. Should be completely avoided. Suitable capacitors and energy saving devices should be incorporated wherever possible to minimise the wastage of energy. Steam should not be wasted and sufficient insulation should be provided to the dye chamber.

FINANCIAL ASPECTS

A. Fixed Capital

(i) Land and Building (Rented) (per month)

(a) Builtup / Covered area	1,500 sq. mt.
(b) Open/Un-covered area	900 sq. mt.
Total area required	2,400 sq. mtrs.
Average rental charges @ 20 sq. mtrs.	Rs. 48,000

(ii) Machinery and Equipments

Sl. No.	Description	Qty.	Amount (In Rs.)
1.	200 Kgs Cap HTHP Yarn Dyeing machine with automation S.S. stock tank 200 kgs capacity open machine type Rapid ADLT Driver and 4 S.S. cheese carries	1No.	35,60,000
2.	Steam Boiler 2 tonnes capacity with water softening plant for boiler	1No.	8,80,000
3.	Electric Hoist 2 tonne capacity	1No.	90,000

Sl. No.	Description	Qty.	Amount (In Rs.)
4.	Laboratory Beaker Dyeing plant	1No.	48,000
5.	Process water softening plant and effluent treatment plant	1No.	11,00,000
6.	Package winding machine	1No.	12,10,000
7.	Rewinding machine	1No.	10,40,000
8.	Stainless Steel Dye and springs (1500 Nos.)		1,10,000
9.	Water storage tanks (Civil construction) Cap. 80,000 litres each	2 No.	3,00,000
10.	M.S. Tanks Cap: 4 MT.	2 No.	1,00,000
11.	D.G. Set 200 kVA	1No.	5,00,000
12.	Lab and testing equipment		1,00,000
13.	Process control and instrumentation equipment		1,00,000
14.	Miscellaneous equipment		1,00,000
	Total		92,38,000

(ii) Other Fixed Assets

	(Rs.)
1. Insurance, Transport, erection cost of pipelines and cables etc.	1,00,000
2. Electrification and wiring	2,00,000
3. Office furniture	1,00,000
4. Pre-operative expenses	1,00,000
Total	5,00,000
Total Fixed Capital	97,38,000

B. Working Capital (per month)

(i) Salaries and Wages

Sl. No.	Designation	Nos.	Salary (Rs.)	Total (Rs.)
1.	Marketing manager	1	8,000	8,000
2.	Sales Officers	2	3,000	6,000
3.	Store Keeper	2	2,500	5,000
4.	Accountant/Cashier	1	2,000	2,000
5.	Clerks/Typists	2	1,500	3,000
6.	Peon	1	2250	2250
7.	Watchmen	2	2250	4500

Sl. No.	Designation	Nos.	Salary (In Rs.)	Amount (In Rs.)
<i>Production Staff</i>				
1.	Technical Manager	1	8,000	8,000
2.	Dyeing master	1	5,000	5,000
3.	Supervisor	2	4,000	8,000
4.	Fabric checkers	2	2500	5,000
5.	Skilled workers	8	2500	20,000
6.	Fitter	1	3000	3000
7.	Electrician	1	3000	3000
8.	Helpers	5	2250	11,250
9.	Boiler operator	1	3000	3000
Total				97,000
<i>Add perquisites @10%</i>				9700
Total				1,06,700
Say				1,07,000

(ii) Raw Materials

Sl. No.	Description	Qty.	Rate (In Rs.)	Amount (In Rs.)
1.	Dyes and chemicals	50,000 kgs.	20/ kg	10,00,000
2.	Packing material, polythene sheet wrapping, card board boxes etc.	LS	LS	50,000
Total				10,50,000

(iii) Utilities (Rs.)			
1.	Electricity bill	10,000 kWh @3/unit	80,000
2.	Water charges	9000/ ltrs.	10,000
3.	Fuel, coal and furnace oil	LS	75,000
4.	Steam consumption	LS	90,000
5.	Effluent treatment charges	LS	15,000
Total			2,70,000

(iv) Other Contingent Expenses (Rs.)	
1.	Building rent 48,000
2.	Repair and maintenance 20,000
3.	Transportation and Cartage 25,000
4.	Postage and Stationery 6,000

(iv) Other Contingent Expenses (Rs.)	
5.	Telephone bills 8,000
6.	Insurance 17,000
7.	Sales and advertisement 16,000
8.	Miscellaneous expenses 10,000
Total 1,50,000	

(v) Total Working Capital (per month) (Rs.)	
i.	Salaries and wages 1,07,000
ii.	Raw Materials 10,50,000
iii.	Utilities 2,70,000
iv.	Other expenses 1,50,000
Total 15,77,000	

C. Total Capital Investment

i.	Fixed capital	Rs. 97,38,000
ii.	Working capital for 3 months	Rs. 47,31,000
Total		Rs. 14,46,9000

FINANCIAL ASPECTS

(1) Cost of Production (Rs.)	
(i)	Total recurring expenditure 1,88,76,000
(ii)	Depreciation on machinery @ 10% 9,23,800
(iii)	Depreciation on other fixed assets @ 20% 10,00,000
(iv)	Interest on total capital investment @14% 20,23,980
Total 21923780	
Say 21924000	

(2) Turnover (per year) (Rs.)	
Processing charges dyeing 2,52,00000	
yarn of 6,00,000 kgs. @ Rs. 42/kg.	

(3) Net Profit (per year)
 = Turnover – cost of production
 = Rs. 25200000 – 21924000
 = Rs. 3276000

(4) Net Profit Ratio

$$= \frac{\text{Net profit (per year)} \times 100}{\text{Turnover (per year)}}$$

$$= \frac{3276000 \times 100}{25200000}$$

$$= 13\%$$

(5) Percent of Profit on Total Investment

$$= \frac{\text{Net profit (per year)} \times 100}{\text{Total Investment}}$$

$$= \frac{3276000 \times 100}{14457000}$$

$$= 23\%$$

(6) Break Even Point

Fixed Cost	(Rs.)
Where as the fixed cost is calculated as below :	
i. Annual building rent	5,76,000
ii. 40% of salaries and wages	494400
iii. 40% of utilities and other expenses	1704000
iv. Depreciation on fixed assets	10,23,800
v. Interest on total capital investment	2023980
vi. Insurance	204000
Total	60,26,180

$$\text{B.E.P.} = \frac{\text{Fixed cost} \times 100}{\text{Fixed cost} + \text{Profit}}$$

$$= \frac{6026180 \times 100}{6026180 + 3276000}$$

$$= 64\%$$

Addresses of Machinery Suppliers

1. M/s. Baltex Engineering Pvt. Ltd.
13th Floor, Jolly Maker Chambers
No. II, Nariman Point,
Mumbai-400021
2. M/s. Paramount Instruments P. Ltd.
B-3/45, Paschim Vihar,
New Delhi-110063
3. M/s. Erhardt Leimer India Ltd.
43, Dr. V. B. Gandhi Road,
Mumbai-400023
4. M/s. Eastern Engineering Co.
Jeevan Udyog, II Floor, 278,
Dr. D. N. Road, Fort,
Mumbai
5. M/s. Srirang Equipment Company
472, Kamarajar Road,

Coimbatore-641004

6. M/s. Ludhiana Dyeing Machinery
Work
Link Road, Ludhiana
7. M/s. Kiran Dyeing Machinery Works
Partap Nagar,
Ludhiana
8. M/s. Electronic and Engineering Co.
EEC House, Plot No. C-7,
Dalia Estate, Andheri (E),
Mumbai-400058
9. M/s. Venkatapathy Foundry
445, Kamarajar Road,
Peelamedu,
Coimbatore-641004

Raw Material Suppliers

1. M/s. ABC Dyes and Chemicals
2282, Gali Hinga Beg, Tilak Bazar,
Delhi-110006
2. M/s. Basf India Ltd.
No. 7, Basant Lok, Vasant Vihar,
New Delhi-110052
3. M/s. Arora Tex Dyes Corporation
Plot No. 108, Sector-24,
Faridabad-110005 (Haryana)
4. M/s. Indokem Ltd.
3/4, Asaf Ali Road,
New Delhi-110002
5. M/s. Andhra Sugars Ltd.
Venkatrayapuram, P. O. No. 2,
Tanuku-534211 (AP)
6. M/s. Sarocevan Dyes Mfr. Co.
Industrial Area 'A',
Ludhiana
7. M/s. Rashmi Dyes and Chemicals
Focal Point,
Ludhiana