

Printing Ink

PRODUCT CODE	: 35216
QUALITY AND STANDARDS	: IS 5046, IS 2105, IS 7771, IS 1234, IS 3680, IS 6830, IS 8744
PRODUCTION CAPACITY	: Qty. : 90,000 Kgs. of different types of printing ink (per annum).
MONTH AND YEAR OF PREPARATION	: January, 2003
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INTRODUCTION

The manufacturing of printing ink enjoys an important place in chemical industry. With the growing demand of a wide spectrum of printing inks and with the advancement of printing processes, the industry offer entrepreneurs the opportunity for career development.

Printing ink is a recipe-oriented product having three basic materials as essential inputs.

1. Pigments - for colouring of ink.
2. Vehicles - to transport the pigment to the plate of printing machine.
3. Binders and extenders and plasticisers - are used to produce printing ink of specific uses.

Printing ink is divided into three main classes:

1. Typographic printing ink.
2. Planographic printing ink.
3. Intaglio printing ink.

Printing ink is available in two forms:

1. Paste form like letter press, offset, screen printing, etc.
2. Liquid ink like flexographic, gravure, rotary newsprint etc.

MARKET POTENTIAL

With the increasing growth rate of printing unit the demand for various types of printing ink is increasing day-by-day. The industry could be set up to meet local requirements also.

BASIS AND PRESUMPTIONS

1. The production capacity is on single shift and 25 working days per month basis with 75% cap. utilization.
2. The costs of plant and machinery, raw-materials, selling price of finished products etc., are the price procuring at the time of preparation of project profile and

may vary depending upon location, market and other various reasons.

3. Unit premises is taken on monthly rental basis.
4. 5% wastage of raw-materials is taken into account.
5. Time period for achieving full envisaged capacity utilization is within 2 years.
6. The labour wages has been taken on the basis of local market.
7. The rate of interest is taken at 14% per annum on an average.
8. Pay-back period of the product is taken as 2 months.
9. The operative period for the project is 10 years.

IMPLEMENTATION SCHEDULE

The time required for completing each activity of the project till commercial production is as follows:

Preparation of project report	1 month
Selection of site	1 month
Registration as SSI	1 month
Availability of finances/loan	3 months
Machinery and equipment Procurement	3 months
Erection and commissioning including electrification	1 month
Trial runs	1 month
Recruitment of personnel and Labour.	2 months

TECHNICAL ASPECTS

Process of Manufacture

Printing Ink is manufactured by proper incorporation of dry pigments into the vehicle by grinding. These two

ingredients in suitable proportions are mixed with or without modifiers, driers, wetting agents, anti-oxidants, etc. Depending upon the types and quality of the printing ink in a mixer like dough type mills, triple roll mill, agitator are used.

For Paste Form Ink

The ingredients are mixed well in a mixer like charge pan mixer, Rotary mixer. After completion of mixing the mixed ingredients is passed through triple roll mill. 7 to 8 passes are given till required fineness is obtained.

For Liquid Ink

Ink formulated with pigments, resin, vehicles and solvent are grounded in a ball mill for 36 - 48 hrs.

For low viscosity ink such as newsprint ink, gravure ink etc. colloid mills are used.

However, after completion of proper mixing and grinding the ink is packed in a suitable container after proper testing in the laboratory.

Quality Control and Standards

Printing inks have to possess all the physical and chemical properties as per Indian Standard specifications for getting good quality and marketability of the products.

The Bureau of Indian Standards has formulated specifications for different types of printing ink as given below:

- | | |
|---|---------|
| 1. Letter press Black book printing ink | IS 5046 |
| 2. Printing ink for general purpose | IS 2105 |
| 3. Halftone | IS 7771 |
| 4. Newsprint ink black | IS 8744 |

5. Offset ink black general purpose IS 6830

The methods of testing of printing ink have been laid down in the IS 6931:72. The laboratory equipments required for the testing of ink are given in Annexure-I.

Production Capacity (per annum)

Quantity	90000 kgs. of different types of printing ink.
Value	Rs. 82,00,000

Motive Power

50 H.P.

FINANCIAL ASPECTS

A. Fixed Capital

(i) Land and building	Rented (Rs.)
Covered area including workshop, shed, raw-material Godown, office space, laboratory, Finished products godown etc.	@ Rs. 16,000 per month

(ii) Machinery and Equipments

Sl. No.	Description	Ind./ Imd.	Qty.	Price (Rs.)
1.	Ball mill size 4" dia x 4" x 6" length made of M.S. plate with refractory lining and 10 H.P. motor	Indigenous	2	4,00,000
2.	Triple roll mill with hollow chilled cast iron roll of 12' x 26" size with water cooling arrangements and 12.5 H.P. motor	-do-	2	9,00,000
3.	Varnish kettle 250 kgs. Capacity made of S.S.	-do-	2	3,70,000
4.	Planetary mixer made of S.S. capacity 250 lts. With dual speed and 5 H.P. motor.	-do-	2	3,00,000

Sl. No.	Description	Ind./ Imd.	Qty.	Price (Rs.)
5.	Pot mill having 3 No. procelain pot of capacity 2 lts. Each with 2 H.P. motor	-do-	1	50,000
6.	Storage and potting vessel 100 kgs. cap. each.	-do-	10	20,000
7.	Weighing scale platform type with capacity 300 kgs.	-do-	1	50,000
8.	Weighing scale 10kgs. Cap.	-do-	1	12,000
9.	Laboratory equipments as per Annexure-I.	-do-		3,00,000
10.	Other equipment and tools	-do-	LS	50,000
	Total			24,52,000
	Electrification and installation charges @10% cost of machines and equipments			2,45,200
	Total			26,97,200
11.	Furnace for varnish			15,000
12.	Furniture and office equipment			75,000
	Total			27,87,200
	Pre-operative expenses including preparation of project report			75,000
	Total			28,62,200
	or Say			28,62,000

B Working Capital (per month)

(i) Personnel

Sl. No.	Designation	No.	Salary (Rs.)	Total (Rs.)
1.	Manager-cum-Chief Chemist	1	9000	9000
2.	Chemist	1	5000	5000
3.	Supervisor	2	3000	6000
4.	Accountant-cum-Store Keeper	1	3000	3000
5.	Skilled workers	4	4000	16000
6.	Semi-skilled workers	3	3000	9000

Sl. No.	Designation	No.	Salary (Rs.)	Total (Rs.)
7.	Unskilled workers	5	2000	10000
8.	Salesman	2	5000	10000
9.	Clerk-cum-Typist	1	3000	3000
10.	Watchman	1	2000	2000
	Total			73000
	<i>Prerequisites @ 15% salaries</i>			10950
	Total			83,950
	or say			84,000

(ii) Raw-Material Including Packaging Requirement (per month)

Particulars	Ind./ Imp.	Qty. Kg.	Rate (Rs.)	Value (Rs.)
Carbon black	Ind.	900	80	72,000
Victoria blue	Ind.	500	500	2,50,000
Phthlocyanine blue	Ind.	136	800	1,08,800
Phenolic Resin	Ind.	140	90	12,600
Maleic Resin	Ind.	140	100	14,000
Alkyd Resin	Ind.	80	90	7,200
Prussian blue	Ind.	52	200	10,400
Ester gum	Ind.	1500	75	1,12,500
Bitumen	Ind.	482	35	16,870
Calcium carbonate	Ind.	850	16	13,600
Linseed oil	Ind.	610	75	45,750
Stand oil	Ind.	64	90	5,760
Aromax solvent	Ind.	21ltrs.	27/ltr.	567
Aluminium hydrate	Ind.	21	40	840
Machine Oil	Ind.	866ltrs.	20	17,320
Grease	Ind.	130	25	3,250
M.T.O.	Ind.	2600ltrs.	19	49,400
White spirit	Ind.	2000ltrs.	19	38,000
Chrome pigment	Ind.	44	120	5,280
Cobalt drier	Ind.	64	400	25,600
Tin container for 1 Kg. pack	Ind.	8000pcs.	28	2,24,000
	Total			10,33,737

(iii) Utilities (per month)	(Rs.)
Power	52,000
Fuel	10,000
Water	1,000
Total	63,000

(iv) Other Contingent Expenses (per month) (Rs.)	(Rs.)
Rent	16,000
Postage and Stationery	2,500
Telephone	2,500
Consumable stores	10,000
Repairs and maintenance	10,000
Transport charges	15,000
Advertisement and publicity	15,000
Insurance	2,000
Sales expenses	10,000
Misc. expenses	7,000
Total	90,000

(v) Total Recurring Expenditure (per month)	(Rs.)
(i) Personnel	84,000
(ii) Raw material	10,33,737
(iii) Utilities	63,000
(iv) Other contingent expenses	90,000
Total	12,70,737
or say	12,71,000

(vi) Total Working Capital (for 3 months basis)
Rs. 12,71,000 × 3 = 38,13,000

Total Capital Investment

(i) Fixed Capital	28,62,000
(ii) Working Capital	38,13,000
Total	66,75,000

Machinery Utilisation

In the project profile the production capacity has been taken on the basis of 75% utilization of the main machinery.

FINANCIAL ANALYSIS

1. Cost of Production (per year) (Rs.)	
Total recurring expenditure 12,71,000×12	1,52,52,000
Depreciation on machinery and equipment @ 10%	2,69,720
Depreciation on furniture and Office Equipment @ 20%	15,000
Depreciation on furnace @ 30%	4,500
Interest on total investment @ 14%	9,34,500
Total	1,64,75,720

2. Turnover (per year)

Item	Qty./ kg.	Rate (Rs.)/Kg.	Value (Rs.)
Cheap Quality	30000	110	33,00,000
Black ink jobbing	25000	175	43,75,000
Black ink medium quality	20000	300	60,00,000
(Blue) Ink Super Gloss	5000	550	27,50,000
Blue Ink	5000	350	17,50,000
Lemon yellow	5000	250	12,50,000
Total			1,94,25,000

3. Net Profit (per year) Before Income Tax

$$\begin{aligned}
 &= \text{Turnover} - \text{Cost of Production} \\
 &= \text{Rs. } 1,94,25,000 - 1,64,75,720 \\
 &= \text{Rs. } 29,49,280
 \end{aligned}$$

4. Net Profit Ratio

$$\begin{aligned}
 &= \frac{\text{Profit (per year)} \times 100}{\text{Turnover (per year)}} \\
 &= \frac{29,49,280 \times 100}{1,94,25,000} \\
 &= 15.18\%
 \end{aligned}$$

5. Rate of Return

$$\begin{aligned}
 &= \frac{\text{Net profit} \times 100}{\text{Total investment}} \\
 &= \frac{29,49,280 \times 100}{66,75,000} \\
 &= 44.18\%
 \end{aligned}$$

6. Break-even Point

(i) Fixed cost (Rs.)	
Depreciation (on machine and equipment, furniture, Office equipment, furnace)	2,89,220
Rent	1,92,000
Interest	9,34,500
Insurance	24,000
40% of salary and wages	4,03,200
40% of other contingent expenses (excluding rent and insurance)	3,45,600
Total	21,88,520

(ii) Net Profit (per year) Rs. 29,49,280

$$\begin{aligned}
 \text{B.E.P.} &= \frac{\text{Fixed cost} \times 100}{\text{Fixed cost} + \text{Net profit (per year)}} \\
 &= \frac{21,88,520 \times 100}{21,88,520 + 29,49,280} \\
 &= 42.60\%
 \end{aligned}$$

Additional Information

The raw-materials and their requirements are worked out on the basis of the formulation of the items mentioned which have scope for regular market. Other types of printing ink can also be manufactured with the machinery provided. Model formulations are given in Annexure-II.

Addresses of Plant and Machinery Manufacturers and Suppliers

1. M/s. Kusum Engg. Co. Ltd.
25, Swallow Lane,
Kolkata -1.
2. M/s. Oriental Machinery Supplying
Agency Limited
25, R. M. Mukherjee Road,
Kolkata - 700001.
3. M/s. Amic Industries Pvt. Ltd.
10, St. Road,
Kolkata - 700056.

4. M/s. Pioneer Engg. Co.
57, Apollo St. Fort,
Mumbai -400001.
5. M/s. D. K. Engineering Works
8, Panchananlata, New Road,
Kolkata - 700056.
6. M/s. A.P.V. Engineering Co. Ltd.
Dum Dum Road,
Kolkata - 700001.
7. M/s. National India Engg. Co. Pvt.
Ltd.
7/10, Hornimen Circle,
Mumbai-400001.
8. M/s. Gidwaney Bros.
73, N.S. Road,
Kolkata - 700001.
9. M/s. Liluah Iron Works
11, Chowringhee Road,
Kolkata -700006.

Addresses of Laboratory Equipment Suppliers

1. M/s. Associated Instruments Mfg.
(India) Ltd.
Gillander House,
8, M.S. Road,
Kolkata - 700001.
2. M/s. Adair Dutta and Co.
B.B.D. Bag,
Kolkata - 700001.
3. M/s. Sheen Instruments Limited
C/o M/s S.B.M. Chemical and
Instruments Pvt. Ltd.
701-D, Poonam Chambers,
Shivsagar Estate,
Dr. Annie Besant Road,
Mumbai - 400018.
4. M/s. United Ink and Varnish Co.
Ltd.
Subhash Road,
Vile Parle (East),
Mumbai - 400057.

Addresses of Raw Material Suppliers

(A) Vehicles and Resin

1. M/s. Bajaj Oil Mills
193, G.T. Road, Howrah.
(West Bengal).
2. M/s. Imperial Oil Mills
9, Jagmohan Malik St.,
Kolkata - 1.
3. M/s. Swaika Oil Mills
Pollock House,
183, Brabourne Road,
Kolkata - 700001.
4. M/s. Goddless Walls Pvt. Ltd.
Forbes Buildings, Hone St.,
Mumbai-400001.

(B) Pigments and Extenders

1. M/s. Associated Pigments Ltd.
14, N.S. Road,
Kolkata - 700001.
2. M/s. Pigment and Chemical
Industries Private Limited
32, Armenian St.,
Kolkata -700001.
3. M/s. Rickett and Coleman of India
Ltd.
10, Chowringhee Road,
Kolkata - 700013.
4. M/s. Imperial Chemical Industries
(I) Private Limited
Kolkata - 700001.
5. M/s. Chamicolour Private Limited
Kasturi Building,
Jamshed Ji Tata Road,
Mumbai - 400001.
6. M/s. Goodlas Nerolac Paints Pvt. Ltd.
Mumbai - 400001.
7. M/s. T. Roberts India Pvt. Ltd.
14, N.S. Road,
Kolkata - 700001.

8. M/s. Sudarshan Chemical Industries Private Limited
27, Shakershet Road,
Pune.
9. M/s. Philips Carbon Black Limited
Udyog Bhavan,
Ballard Estate,
Mumbai - 400007.
10. M/s. United Aniline and Chemical Co. Private Limited
56, Rosemary Lane,
Howrah(West Bengal)
11. M/s. V.G. Colour Industries
Mumbai - 400007.

(C) *Driers*

1. M/s. General Pigments and Chemicals Private Limited
Vihar lake Road,
Saki Naka, Kurla,
Mumbai - 400001.
2. M/s. Gandhi Parekh Investment Corp. Agra Road,
Ghatkopar,
Mumbai -400001.
3. M/s. Calcutta Paints and Driers Pvt. Ltd.
P-8, Dalimotala Lane,
Kolkata - 700006.
4. M/s. Calcutta Industrial Chemicals and Minerals Co. Pvt. Ltd.
43, Lenin Sarani,
Kolkata - 700013.

(D) *Turpentine and Resin*

1. M/s. Indian Turpentine and Resin Co.
Bareilly, U.P.
2. M/s. Turpentine Subsidiary India Limited
Bareilly, U.P.

Annexure-I

List of Laboratory Equipment

1. Hegman Grinding Gauges
2. Ford Flow cup Viscometer
3. U-Tube viscometer
4. Colorimeter
5. Wet Film Thickness Gauge
6. Glossometer
7. Tackometer
8. Adjustable Film applicator
9. Checker Board
10. Centrifuge
11. Flow gauge
12. Weight per litre cup
13. Attritor (small size)
14. Sieves
15. Hydrometer
16. Able refractometer
17. Able flash point apparatus
18. Pensky Martin flash point apparatus
19. Colour matching examination table.

Annexure-II

List of Formulations of Printing Ink

1. Lemon Yellow Printing Ink

Middle chrome pigment	10%
Ppt. calcium carbonate	45%
Penta ester Gum	15%
M.T.O.	29%
Cobalt drier	1%
2. Jobbing Black Ink

Carbon Black	15%
Bitumen	21%
Penta Ester gum	5%

MTO(Mineral Turpentine Oil)	58%	Cobalt drier	2%
Cobalt drier	1%	Aluminium Hydride	5%
3. Colour Ink (Blue)		5. Medium Quality Prints (Blue)	
Phthalocyanine blue	14%	Victoria Blue	12%
Phenolic Resin	10.5%	Calcium Carbonate	35%
Maleic Resin	10.5%	Linseed Oil	10%
Alkyd Resin	7.5%	Phenolic Resin	2.25%
Alkali free Linseed oil	45.5%	Maleic Resin	2.25%
Stand oil	10.0%	Alkyd Resin	0.50%
Cobalt drier	2.0%	Ester gum Resin	13%
4. Super Gloss Ink (Blue)		M.T.O.	24%
Phthalocyanine Blue	18%	Cobalt drier	1%
Phenolic Resin	9%	6. Cheap Quality Black Ink	
Maleic resin	9%	Carbon Black	20%
Alkyd Resin	8%	Machine Oil	33%
Linseed oil	39%	Resin	40%
Aromex	5%	Grease	5%
Stand Oil	5%	Prussian Blue	2%