

PRINTING INK

1. 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.

2. PRODUCT & ITS APPLICATION:

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

1. Pigments - for coloring of ink. 2. Vehicles - to transport the pigment to the plate of printing machine. 3. Binders and extenders and plasticizers - are used to produce printing ink of specific uses. Printing ink is divided into three main classes:

1. Typographic printing ink.
2. Plano graphic 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.

3. DESIRED QUALIFICATIONS FOR PROMOTER:

Graduate in any discipline.

4. INDUSTRY LOOK OUT AND TRENDS

One of the prime drivers for the global printing inks market is the rising demand from the packaging sector. The packaging sector has attained unprecedented

importance in recent years due to the steady growth of ecommerce and rising demand for international shipping of non-consumer goods. Paperboard packaging has become important in the packaging sector due to its sturdy nature, and the global printing inks market has benefited immensely from the consistent demand for printing on packaging equipment. Rapid globalization has also resulted in growing demand from the global printing inks market and is likely to remain a key driver for the market in the coming years.

On the other hand, the printing inks market is restrained by the decline of the publishing industry in recent years, as digital publishing has become more popular due to its greater convenience to users. This has led to a reduction in the demand for printing inks from the publishing industry and is likely to hinder the printing inks market's growth in the coming years. The rising number of newspapers focusing on digital subscriptions in addition to or even in place of conventional paper printing is a key factor in this and could damage the printing inks market significantly in the coming years.

5. MARKET POTENTIAL AND MARKETING ISSUES, IF ANY:

India is among the fast growing printing ink markets globally spurred by the rapid expansion of the domestic print markets. Backed by a strong demand from key end user segments such as package printing, newsprint, publishing and other commercial printing, the printing ink market in India has registered strong growth in the recent years. The printing ink industry is fragmented with over 550 manufacturers and a large number of players in the un-organized sector.

Printing ink sector in India is estimated at 3, 60,000 tons for 2019-20, valued at around INR 55 billion; the market witnessed a growth of around 7.5% per annum during the last 10 years. Printed packaging accounts for around 27% of the demand for printing inks in India followed by newspapers at 20%. Commercial printing/ promotional and printed advertising together account for around 19% of the demand. Other key end user segments for printing inks include books and stationery. With the print sector forecast to grow at around 8% per annum, over

the next 5 years, printing ink segment is expected to grow strongly during the same period.

Micro Inks (Huber group), DIC India, Sakata, Siegwerk, Flint and Toyo are the leading manufacturers of printing ink in India. The printing ink sector witnessed consolidation during the last 10 to 15 years. Some of the notable acquisitions-collaborations in the Indian ink industry during this period are: Huber Group – Micro Inks, Dai Nippon – Coates of India, Siegwerk –SICPA, Flint Group – Inco wax, etc.

More recently, some players have embarked on capacity expansions In 2013, Flint Group inaugurated new liquid ink plant in Vadodara In 2012, Siegwerk India increased its printing ink production capacity at its plant in Bhiwadi, Rajasthan, to 20,000 tons per annum from 10,000 tons per annum In 2011, DIC India undertook capacity expansion at the company’s facility in Ahmedabad; the expansion increased the unit’s capacity to 14,400 tons per annum from 6,000 tons per annum.

The top six players comprising domestic players and established multinational players account for around 75% of the market. Printing inks has a well-entrenched presence of multinational players who have entered the market either through a direct subsidiary or through Joint Ventures with existing domestic players. Going forward, the printing ink market is set to benefit from rapid urbanization, increasing literacy rates and growth of FMCG sector.

6. RAW MATERIAL REQUIREMENTS:

Raw-Material Including Packaging Requirement (per month)

Sr. No.	Particulars	Ind./Imp	Qty. Kg.	Rate(Rs.)	Value (Rs.)
1	Carbon black	Ind.	900	80	72,000

2	Victoria blue	Ind.	500	500	2,50,000
3	Phthlocyanine blue	Ind.	136	800	1,08,800
4	Phenolic Resin	Ind.	140	90	12,600
5	Maleic Resin	Ind.	140	100	14,000
6	Alkyd Resin	Ind.	80	90	7,200
7	Prussian blue	Ind.	52	200	10,400
8	Ester gum	Ind.	1500	75	1,12,500
9	Bitumen	Ind.	482	35	16,870
10	Calcium carbonate	Ind.	850	16	13,600
11	Linseed oil	Ind.	610	75	45,750
12	Stand oil	Ind.	64	90	5,760
13	Aromax solvent	Ind.	21 ltr	27/ ltr	567
14	Aluminium	Ind.	21	40	840
15	Hydrate Machine Oil	Ind.	866 ltr	20	17,320
16	Grease	Ind.	130	25	3,250
17	M.T.O.	Ind.	2600 Ltr	19	49,400
18	White spirit	Ind.	2200 ltr	19	38,000
19	Chrome pigment	Ind.	44	120	5,280
20	Cobalt drier	Ind.	64	400	25,600
21	Tin container for 1 Kg.pack	Ind.	8000pcs	28	2,24,000
	Total				10,33,737

7. MANUFACTURING PROCESS:

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, and 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 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 IS 5046 printing ink
2. Printing ink for general IS 2105 purpose
3. Halftone IS 7771
4. Newsprint ink black IS 8744
5. Offset ink black general IS 6830 purpose

The methods of testing of printing ink have been laid down in the IS 6931:72.

8. MANPOWER REQUIREMENT:

The enterprise requires 8 employees as detailed below:

Sr. No.	Designation of Employees	Monthly Salary ₹	Number of employees required				
			Year-1	Year-2	Year-3	Year-4	Year-5
1	Machine Operators @ 12000	12,000	1	1	1	1	1
2	Helpers @ 8000	24,000	3	3	3	3	3
1	Production supervisor @15000	15,000	1	1	1	1	1
2	Accounts/Stores Asst @12500	25,000	2	2	2	2	2
3	Office Boy @9000	9,000	1	1	1	1	1
	Total	85,000	8	8	8	8	8

9. IMPLEMENTATION SCHEDULE:

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

Sr. No.	Activity	Time Required (in months)
1	Acquisition of premises	1.00
2	Construction (if applicable)	

3	Procurement & installation of Plant & Machinery	2.00
4	Arrangement of Finance	2.00
5	Recruitment of required manpower	1.00
	Total time required (<i>some activities shall run concurrently</i>)	3.00

10. COST OF PROJECT:

Fixed Capital

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

The project shall cost ₹ 69.80 lacs as detailed below:

Sr. No.	Particulars	₹ in Lacs
1	Land	-
2	Building	-
3	Plant & Machinery	27.50
4	Furniture, Electrical Installations	3.30
5	Other Assets including Preliminary / Pre-operative expenses	1.00
6	Working Capital	38.00
	Total	69.80

11. MEANS OF FINANCE:

Bank term loans are assumed @ 75 % of fixed assets. The proposed funding pattern is as under:

Sr. No.	Particulars	₹ in Lacs
1	Promoter's contribution	17.50
2	Bank Finance	52.30

	Total	69.80
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12. WORKING CAPITAL CALCULATION:

The project requires working capital of ₹ 38.00 lacs as detailed below:

Sr. No.	Particulars	Gross Amt	Margin %	Margin Amt	Bank Finance
1	Inventories	10.00	25	2.50	7.50
2	Receivables	25.00	25	6.25	18.75
3	Overheads	3.00	100	3.00	-
4	Creditors	-		-	-
	Total	38.00		11.75	26.25

13. LIST OF MACHINERY REQUIRED:

A detail of important machinery is given below:

Sr. No.	Particulars	UOM	Qty	Rate (₹)	Value (₹ in Lacs)
	Plant & Machinery / equipments				
a)	Main Machinery				
i.	Ball mill size 4"dia ×4"× 6" length made of M.S. plate with refractory Lining and 10 H.P. motor	Nos	2		4.50
ii.	Triple roll mill with refractory Lining and 10 H.P. motor	Nos	2		10.50
Sr. No.	Particulars	UOM	Qty	Rate (₹)	Value (₹ in Lacs)
iii.	hollow chilled cast iron roll of 12'× 26"size with water cooling arrangements and 12.5 H.P. motor		2		4.00
	Varnish kettle 250 kgs. Capacity made of S.S.		3		1.50
	Pot mill having				
b)	Ancillary machinery				

i.	Planetary mixer made of S.S. Capacity 250 lts. With dual speed and 5 H.P. motor	Nos	2		2.50
	Procelain pot of capacity 2 lts. Each with 2 H.P. motor		2		1.50
ii.	Storage and potting Weighing scale platform type	LS			3.00
	<i>sub-total Plant & Machinery</i>				27.50
	Furniture / Electrical installations				
a)	Office furniture	LS	1.00		1.00
b)	Stores Almirah	LS	1.00		0.30
c)	Computer & Printer	Nos	2.00	1,00,000	2.00
	<i>sub total</i>				3.30
	Other Assets				
a)	Rent Deposits		2.00	50,000	1.00
	<i>sub-total Other Assets</i>				1.00
	Total				31.80

14. PROFITABILITY CALCULATIONS:

Sr. No.	Particulars	UOM	Year-1	Year-2	Year-3	Year-4	Year-5
1	Capacity Utilization	%	70%	80%	90%	90%	90%
2	Sales	₹. In Lacs	136.50	156.00	175.50	175.50	175.50
3	Raw Materials & Other direct inputs	₹. In Lacs	115.50	132.00	148.50	148.50	148.50
4	Gross Margin	₹. In Lacs	21.00	24.00	27.00	27.00	27.00
5	Overheads except interest	₹. In Lacs	17.50	17.50	18.50	19.50	20.00
6	Interest @ 10%	₹. In Lacs	5.50	5.50	4.50	3.65	2.50
7	Depreciation	₹. In Lacs	2.85	2.85	1.90	1.60	1.30
8	Net Profit before tax	₹. In Lacs	-04.85	-1.85	2.10	2.25	3.20

The basis of profitability calculation:

The growth of selling capacity will be increased 10% per year. (This is assumed by various analysis and study; it can be increased according to the selling strategy.)

Energy Costs are considered at Rs 7 per Kwh and fuel cost is considered at Rs. 65 per litre. The depreciation of plant is taken at 10-12 % and Interest costs are taken at 14 -15 % depending on type of industry.

15. BREAKEVEN ANALYSIS:

The project shall reach cash break-even at 76.66 % of projected capacity as detailed below:

Sr. No.	Particulars	UOM	Value
1	Sales at full capacity	₹. In Lacs	195.00
2	Variable costs	₹. In Lacs	192.50
3	Fixed costs incl. interest	₹. In Lacs	23.00
4	BEP = $FC/(SR-VC) \times 100 =$	% of capacity	76.66

16. STATUTORY / GOVERNMENT APPROVALS

As per the allocation of business rules under the Constitution, labour is in the concurrent list of subjects. It is dealt with by the MOLE at the Central and Departments of Labour under State Governments in respective States / UTs. The MOLE has enacted workplace safety and health statutes concerning workers in the manufacturing sector, mines, ports and docks and in construction sectors.

Further, other Ministries of the Government of India have also enacted certain statutes relating to safety aspects of substances, equipment, operations etc. Some of the statutes applicable in the manufacturing sector are discussed below:

The Static and Mobile Pressure Vessels (Unfired) Rules, 1981

These (SMPV) Rules are notified under the Explosives Act, 1884. These rules regulate storage, handling and transport of compressed gases. These rules stipulate requirements regarding construction and fitments, periodic testing, location, fire protection, loading and unloading facilities, transfer operations etc. in respect of pressure vessels whose water capacity exceeds one thousand litres. These rules are enforced by the Chief Controller of Explosives under the Ministry of Industry and Commerce, Govt. of India (PESO).

The Manufacture, Storage and Import of Hazardous Chemicals Rules (MSIHC), 1989

These MSIHC Rules are notified under the Environment (Protection) Act, 1986. These rules are aimed at regulating and handling of certain specified hazardous chemicals. The rules stipulate requirements regarding notification of site, identification of major hazards, taking necessary steps to control major accident, notification of major accident, preparation of safety report and on-site emergency plan; prevention and control of major accident, dissemination of information etc. These rules are notified by the Ministry of Environment and Forests (MOEF) but enforced by the Inspectorates of Factories of respective States / UTs in the manufacturing sector.

The Factories Act, 1948 and State Factories Rules

The Factories Act, 1948 is very comprehensive legislation dealing with the matters of safety, health and welfare of workers in factories. The Act places duties on the occupier to ensure safety, health and welfare of workers at work. Some of the salient provisions of the Act include:

- Guarding of machinery
- Hoists and Lifts; Lifting Machines and Appliances
- Revolving Machinery
- Pressure Plant
- Excessive Weight

- Protection of Eyes
- Precautions against dangerous fumes, gases etc.
- Explosive or inflammable dust, gas etc.
- Precautions in case of fire
- Safety of buildings and machinery
- Permissible limits of exposure of chemical and toxic substances
- Entrepreneur may contact State Pollution Control Board where ever it is applicable.

17. BACKWARD AND FORWARD INTEGRATIONS

Chemical companies often become integrated and undergo other activities outside the chemical industry. Increased competition prompts many companies to reduce supply chain costs by looking outside the chemical sector at suppliers and customers. While most companies within the chemicals sector primarily produce chemicals, some companies also conduct other manufacturing activities. The exact proportion of chemicals sector companies that are integrated with other sector activities is unknown, but many companies actively seek vertical integration. Many manufacturers pursue vertical integration to secure suppliers and customers for their products.

Mergers and acquisitions are a common way for companies to undertake new chemical ventures. By purchasing their chemical suppliers, some manufacturers secure future chemical feedstock for their products or other chemicals that they use in manufacturing. The company making the purchase obtains valuable expertise and equipment. Some mining and petrochemical production is more cost-effective when integrated within a chemical company.

Energy and feedstock costs are often a significant expense for chemical companies. Integrating chemical production with activities that secure supplies of

chemical feedstock and energy is relatively common as chemical companies grow. Chemical companies are located near mines, oil fields, ammonia factories and water supplies. This reduces transportation costs and increases the reliability of supplies by reducing the distance between feedstock and the factory.

Some companies, such as Sino-Coking Coal and Coke Chemical Industries Incorporated, own their mines. BHP Billiton operates a broad range of mines and is primarily a mining company. It does, however, also produce petrochemical feedstock for the chemical industry and therefore operates within the chemical industry as well. These companies technically operate within both the chemical and mining industries in their normal business operations.

Integrating a chemical company with other activities provides several direct benefits for the company and is becoming increasingly common. High energy costs necessitate greater control of energy resources and minimal reliance on expensive transportation. Chemical companies experience volatile profitability due to fluctuations in feedstock and energy expenses. Some companies control this volatility through careful supply chain management and by charging supply surcharges. Actively researching and developing alternative feedstock and energy supplies helps the company reduce costs.

Vertical integration supports these activities by eliminating redundant activities at multiple companies and increasing efficiency. By consolidating activity among multiple, similar operations, chemical companies achieve cost savings that contribute to higher profitability. End products are often very profitable, and some chemical companies purchase their former customers to take advantage of the marked-up prices of products further along in the supply chain.

Integration may become more common for many chemical companies as competition strengthens and traditional feedstock becomes more expensive. Market demand for chemical feedstock increases as emerging market economies grow and result in increased consumer spending around the world.

18. TRAINING CENTERS AND COURSES

There is no such training required to start this business but, basic chemical bachelor's degree is plus point for enterpriser. Promoter may train their employees in such specialized institutions to grow up the business. There are few specialised Institutes provide degree certification in chemical Technology, few most famous and authenticate Institutions are as follows:

1. Department of chemical LD college of engineering
No.120, Circular Road, University Area, Navrangpura,
Opposite Gujarat University, Ahmedabad, Gujarat 380015
2. MIT College of chemical Engineering, Pune
Gate.No.140, Raj Baugh Educational Complex,
Pune Solapur Highway,
Loni Kalbhor, Pune - 412201
Maharashtra, India

Udyamimitra portal (link : www.udyamimitra.in) can also be accessed for handholding services viz. application filling / project report preparation, EDP, financial Training, Skill Development, mentoring etc.

Entrepreneurship program helps to run business successfully is also available from Institutes like Entrepreneurship Development Institute of India (EDII) and its affiliates all over India.

Disclaimer:

Only few machine manufacturers are mentioned in the profile, although many machine manufacturers are available in the market. The addresses given for machinery manufacturers have been taken from reliable sources, to the best of knowledge and contacts. However, no responsibility is admitted, in case any inadvertent error or incorrectness is noticed therein. Further the same have been given by way of information only and do not carry any recommendation.

Source:- Udyami Mitra/Sidbi