

Sulphur Black Dye

PRODUCT CODE	: 312258003
QUALITY AND STANDARDS	: As per Customer's Specification.
MONTH AND YEAR OF PREPARATION	: January, 2003
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INTRODUCTION

The commercial importance of sulphur black dye is due to its ease of manufacturing. Dye belongs to the group of sulphur dyes. It is soluble in hot aqueous solution of sodium sulphide and the solution is having high degree of properties than many other cotton dyes available in the market. The main drawback of this dye is poor fastness to chlorine. The fastness of dye can be increased by using melamine for formaldehyde resin which forms chloramines derivative with chlorine, sulphur dye has a tendency to develop sulphuric acid on storage. It is suggested to use airtight vessel for storage and cool dry condition is very essential. This dye cannot be stored for a very long time since deterioration is likely to occur.

MARKET POTENTIAL

According to data available for dye stuffs and intermediates the domestic demand for sulphur black dye was 6950

MT during 2000-2001 and likely to increase further in the coming years. Beside, there is a good export potential for the dyes in developed and developing countries. Keeping in view the increase in demand further there is a good scope for the setting up of new units for the manufacturing of sulphur black dye. It is reported that in the small scale sector the production as per 2nd all India Census was worth Rs. 148 lakhs per annum.

BASIS AND PRESUMPTIONS

1. This scheme is prepared on the basis of 10 MT per month production.
2. The unit will run of 3 shifts per day and 300 days per annum.
3. The salary and wages to the Staff and labour are as per prevailing wages act.
4. Interest on fixed and working capital has been calculated at the rate of 14% per annum.

- The cost of land and building, plant and machinery, equipments, Raw materials and the selling price of finished product are as per the prevailing market rate and may vary depending upon various factors.

IMPLEMENTATION SCHEDULE

	Period (in months)
1. Project report preparation	1
2. Building construction	2
3. Financial assistance from financial institution	3
4. Plant and machinery procurement	3
5. Installation	1/2
6. Trial run	1/2
7. Commencement of production	10

TECHNICAL ASPECTS

Process of Manufacture

The dye manufacturing process is controlled and standardized in order to produce homogenous dyestuff with specified dyeing properties. The sulphur dye consists of a mixture of compounds carrying in molecular size sulphur content and other properties. Although sulphur dyes are prepared from varied types of intermediates and other varied conditions, their chemical reactivity and dyeing properties are very similar. The dyeing properties are essentially dependent on the content of sulphur as sulphide or disulphide linkages or thiazole or thiazine ring system.

The process for the manufacture of sulphur black involves heating of dinitro-chloro benzene (dncb) at 100° C with

help of steam in a jacketed mild steel reactor. Caustic dye is then added to it very slowly at 90°–100° C to make dinitro-phenol. Similarly, polysulphide of sodium is prepared in a separate vessel by reacting caustic lye and sulphur at 135° C. The whole mass is then transferred to dinitro phenol solution and heated for 24 hours at 110°C. During the reaction air is passed for 12 hours at 90° C. After completion of the reaction the mass is filtered, washed and solubilized. The sulphur black solution thus obtained is dried in steam heated plates to obtain sulphur black grains.

The filtrate contains about 200 gm/lit. of sodium thio sulphate. The solution is evaporated in evaporators to make the solution viscous and is then sent to crystallize to get sodium thio sulphate in crystal form and packed.

Quality Control and Standards

Most of the units are manufacturing this item as per customer's specification. The product is strictly manufactured to the standard and specification required by the purchaser.

Raw Material

The main Raw Materials required for the manufacture of sulphur black dye are dinitro-chlorobenzene, caustic soda, sulphur and sodium sulphide. All the Raw Materials are indigenously available except the sulphur, which may be obtained through MMTC.

Annual Production Capacity

Item	Quantity	Rate/ MT (Rs.)	Value (Rs.)
Sulphur black Sodium thio	120 MT	82500	99,00,000
Sulphate	120 MT	26000	31, 20,000

FINANCIAL ASPECTS

A. Fixed Capital

(i) Land and Building		(Rs.)
Land – 1000 Sq.Mtr.	600 Sq.Mtr.	6,00,000
Built up area 500 Sq. Mtr.	1000 Sq.Mtr.	5,00,000
	Total	11,00,000

(ii) Plant and Machinery

Sl. No.	Description	Qty.	Value (Rs.)
1.	MS reaction vessel jacketed with stirrer, 5 H.P.	1	200000
2.	MS reaction vessel jacketed with heating coils.	1	225000
3.	MS solubilizing vessel with heating coils, Stirrer with 3 H.P. motor cap 5 KL	1	175000
4.	MS sodium sulphide dissolving tank with heating coils, stirrer complete with 3 H.P. motor cap 3 KL	1	150000
5.	Vaccum filters with vacuum pumps 2 H.P. motor	1	160000
6.	Steam drying pelted	4	150000
7.	Crystallize with 3 H.P. motor	2	100000
8.	Filter press	1	100000
9.	Baby boiler with all accessories	1	250000
10.	Storage tank for sodium thio Sulphate solution	1	75000
11.	Grinder with 2 H.P. motor	1	30000
12.	Rotary air blower with 5 H.P. motor	1	40000
13.	Water pump (monoblock) with 2 H.P.	1	20000
14.	Laboratory equipment	LS	75000
15.	Equipment for pollution control	LS	230000
16.	Pre-operative expenses		200000
	Total		20,00,000
17.	Electrification and installation charges 10% of the cost of plant and machinery		200000
18.	Office furniture and equipment		50000
	Total		22,50,000

$$\begin{aligned}
 \text{(iii) Fixed Capital} &= \text{(i+ ii)} \\
 &= \text{Rs. } 11,00,000 + 22,50,000 \\
 &= \text{Rs. } 33,50,000
 \end{aligned}$$

B. Working Capital (per month)

(i) Salary to Staff and Labour

Designation	No.	Salary (Rs.)	Value (Rs.)
1. Manager	1	5000	5000
2. Chemist	1	3000	3000
3. Skilled workers	4	2500	10000
4. Unskilled workers	4	1750	7000
5. Electrician	1	2000	2000
6. Boiler attendant	1	2000	2000
7. Clerk-cum-typist	1	3000	30000
8. Watchman	1	1500	1500
	Total		33500
	Perks 20%		6700
	Total		40200
	Or say		40000

(ii) Raw Material

1. Dinitrochloro benzene	5.5MT	4000 MT	220000
2. Caustic soda lye	16MT	5000 MT	240000
3. Sulphur	7 MT	5800 MT	40600
4. Sodium sulphide	3MT	30000 MT	90000
5. Steam coal	35 MT	4000MT	140000
6. Packing material			7400
	Total		7,38,000

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

(i) Power	10,000 KWH	2,50 KWH	25000
(ii) Water	1600 KL	50 KL	800

(iv) Other Contingent Expenses (Rs.)

1. Postage and Stationery	2000
2. Telephone	1000
3. Consumable stores	5000

4. Repair and Maintenance	5000
5. Transport and travelling	5000
6. Insurance	1000
7. Miscellaneous Expenses	2000
Total	21,000

(v) Working Capital Requirement (per month)

$$\begin{aligned}
 &= (i + ii + iii + iv) \\
 &= \text{Rs. } 40000 + \text{Rs. } 738000 + \\
 &\quad \text{Rs. } 25800 + \text{Rs. } 21000 \\
 &= \text{Rs. } 8,25,000
 \end{aligned}$$

(vi) Working Capital Requirement (for 3 Months)
 Rs. 8,25,000 × 3 = Rs. 24,75,000

C. Total Capital Investment

(1) Total Cost of Projection	(Rs.)
(i) Fixed Capital	3350000
(ii) Working capital 3 months	24,75000
Total	5825000

FINANCIAL ASPECTS

(1) Annual Cost of Production (per annum) (Rs.)	
1. Recurring expenses	9900000
2. Depreciation on building @ 5%	25000
3. Depreciation on plant and machinery equipment @ 10%	2,03,000
4. Interest on Total Capital Investment @14%	81,5500
Total	10943500

(2) Annual Sale

Item	Quantity	Rate/MT (Rs.)	Value (Rs.)
Sulphur black	120 MT	82500/MT	99,00,000
Sodium	120 MT	26000/MT	31,20,000
Total			130,20,000

(3) Annual Profit

$$\begin{aligned}
 \text{Profit} &= \text{Annual Sale} - \text{Annual Cost of Production} \\
 &= \text{Rs. } 130,20,000 - 10944000 \\
 &= \text{Rs. } 2076000
 \end{aligned}$$

(4) Profit % on Sale

$$\begin{aligned}
 &= \frac{20,76000 \times 100}{13020000} \\
 &= 15.94\%
 \end{aligned}$$

(5) Return on Investment

$$\begin{aligned}
 &= \frac{2076000 \times 100}{5825000} \\
 &= 35.60\%
 \end{aligned}$$

Fixed Cost	(Rs.)
40% of salary	192960
40% of utilities	123840
40% of other contingent expenses	100800
Interest on total capital investment @ 4% (per annum)	81,5500
Depreciation on machinery @10%	203000
Depreciation on building @5%	25000
Total	1461100
Or say	1461000

$$\begin{aligned}
 \text{B.E.P.} &= \frac{\text{Fixed Cost} \times 100}{\text{Fixed} + \text{Annual Profit}} \\
 &= \frac{1461000 \times 100}{1461000 + 2076000} \\
 &= \frac{1461000 \times 100}{3537000} \\
 &= 41.30\%
 \end{aligned}$$

Addresses of Machinery Suppliers

1. M/s. Standard metal Engg. works
21/13, Block-A,
Naraina Industrial Area,
New Delhi-110028
2. M/s. Rank and Co.
A-11, Wazirpur Industrial Area,
New Delhi
3. M/s. Farichem
98, Okhla Industrial Estate,
New Delhi-110020
4. M/s. Mechanicals
15, Okhla Industrial Estate,
New Delhi-110020

Addresses of Raw Material Suppliers
(Sulphur imported through MMTC)

Caustic

1. M/s. Shri Ram Chemicals and Fertilizers
New Delhi
2. M/s. Modi Chemicals Industries
Modi Nagar,
Ghaziabad.
3. M/s. Gujarat Alkali
Chemicals,
Vadodara.

Sodium Sulphide

1. M/s. Didwara Chemicals

Didwara,
Rajasthan

2. M/s. Kota Chemicals
10-A, Ind. Estate,
Kota-324007.

Dinitrochloro Benzene

1. M/s. Monali Chemicals
E-9, Jethwa Nagar,
4th Floor, VL Road,
Opp. Kandivili Station (W),
Mumbai-400067
2. M/s. Chemic Organic Chemicals
(I) Pvt. Ltd.
Hemu Plaza Vile Parle (W),
Mumbai-400056