

Copper Powder

PRODUCT CODE	: 333906004
QUALITY AND STANDARDS	: IS 440:1964, IS 261:1966, IS 5644:1985, : IS 7438:1985
MONTH AND YEAR OF PREPARATION	: September, 2002
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INTRODUCTION

Copper Powder is the basic raw material for many of the sintered products. These products find their uses in aircrafts, space crafts, parts for guns, porous metal bearings, filter gas diffusers, welding rods, bimetallic strips and electrical parts. The usage of copper powder has increased manifold by virtue of its physical properties, long life high scrap value and wide range of uses. Next to iron and steel, it is widely used in the market.

MARKET POTENTIAL

The indigenous production of copper powder is only around 7000 tonnes per annum as against an estimated demand of about 15000 tonnes per annum. This itself shows the huge demand for the

product in India. Since there are only a few small scale manufacturing units scattered over the country, the market potential for the product is very large.

BASIS AND PRESUMPTIONS

The unit is expected to work for 8 hours a day on single shift basis and 25 days in a month/300 days in a year and the details are worked out consistently. The labour wages, cost of raw material, cost of machinery are based on local market. Interest rate for fixed and working capital is taken @ 14%. Rented covered area of the shed of about 250 sq. metres on a monthly rent of Rs.10,000 has been considered.

IMPLEMENTATION SCHEDULE

The major activities and their implementation schedule are furnished

below. The assessment of the items required for implementation of the project has been considered and accounted from the date of sanction of the loan:

Sl. Activities No.	Period in months
1. Application to financial institutions, submission of documents, certificates for loan and other formalities	1
2. Placement of orders for machinery and equipments and application for power connection	1
3. Procurement of raw materials	1
4. Clearing machinery, installation, electrification etc.	1
5. Trial and commercial production	1
Total	5

TECHNICAL ASPECTS

Process of Manufacture

Even though there are different processes of manufacture like mechanical pulverisation and chemical reduction, the chemical reduction process of manufacture entails non-pollution hazards and higher purity of the product. If the ordinary process of electrolytic copper refining is modified, the copper is deposited on electrodes as a fine powder. By suitable control over the operating conditions, a specific particle size and particle size distribution can be obtained.

Electrolysis takes place in a series of glass lined special vessels having about two cathodes and three anodes per vessel. The size of vessel is about 2.5 ft × 2.5 ft × 2.5 ft deep. The cathodes are made of aluminium sheets and anodes are of copper. The distance between the electrodes is two inches. Sometimes, pure lead is used as anode material. The electrolyte is acid copper sulphate

solution containing about 10 grams per litre of copper sulphate and 20–50 grams of sulphuric acid. Continuously electrical energy is supplied and by means of wooden handled aluminum scraps, the copper powder is detached from the electrodes and allowed to fall down to the bottom periodically. After removal, the powder is centrifuged and washed with water until it is free of copper sulphate. Final drying takes place on trays in an electrically heated oven having forced air circulation system at a temperature of 60°C to 100°C.

Quality Control and Standards

Product is manufactured as per IS:440-1964, IS:261-1966, IS: 5644-1985 and IS:7438-1985.

Production Capacity

The production capacity per annum by this process of manufacture is about 120 M.Tons.

Motive Power

Power requirement is 125 KW.

Pollution Control

Since no pollutants are generated during and after manufacture, no pollution control methods are required.

Energy Conservation

Energy requirement for this method of manufacture is about 15% more than the other processes, the production capacity is higher leading to better profitability.

FINANCIAL ASPECTS

A. Fixed Capital

(i) Land and Building

Covered area of the shed Rs. 10,000 per month of 250 sq metre (Rented)

(ii) Machinery and Equipments

Sl. No.	Item	Qty. (Nos.)	Amount (In Rs.)
1.	Acid resistant glass lined vessels—2.5 ft×2.5 ft. ×2.5 ft	6	48,000
2.	Centrifuge	1	1,00,000
3.	Electrically heated ovens with forced air circulation system pump—60°C to 100°C	1	2,00,000
4.	Rotary cylindrical screening machine	1	1,00,000
5.	M.AS. Water tank, storage bins etc.	1	1,80,000
6.	Weighing machine capacity 500 kg, allied tools and equipments	1	1,00,000
7.	Quality testing laboratory equipments	LS	2,00,000
Total			9,28,000
8.	Electrification and installation charges @ 10% of the cost of the machinery and equipments	LS	92,800
9.	Furniture and other office equipments	LS	1,50,000
Total			11,70,800

B. Working Capital (per month)**(i) Raw Materials**

Sl. No.	Item	Qty. (Nos.)	Rate (In Rs.)	Amount (In Rs.)
1.	Copper Sulphate	25 MT	110 kg.	27,50,000
2.	Aluminium Sheet and Copper/Pure lead sheets	—	—	1,50,000
3.	Packing materials	—	—	50,000
4.	Other miscellaneous and consumable stores	—	—	50,000
Total				30,00,000

(ii) Salaries and Wages (per month)

Sl. No.	Designation	No.	Salary (In Rs.)	Amount (In Rs.)
1.	Works Manager	1	6,000	6,000
2.	Chemist	2	5,000	10,000
3.	Production Supervisor	2	3,000	6,000

4.	Skilled Workers	3	2,500	7,500
5.	Semi-skilled Workers	3	2,000	6,000
6.	Helpers	4	1,500	6,000
7.	Accountant	1	3,000	3,000
8.	Clerk/Typist	2	3,000	6,000
9.	Sales Officer	1	3,000	3,000
10.	Peon	2	2,000	4,000
11.	Watchman	2	1,500	3,000
Total			60,500	
<i>Perquisites @ 15%</i>			9,075	
Total			69,575	
Say			69,000	

(iii) Other Contingent Expenses (per month)

Sl. No.	Description	Amount (In Rs.)
1.	Rent	10,000
2.	Power and Water	80,000
3.	Postage and Stationery	1,500
4.	Advertisement and Publicity	1,500
5.	Transport Charges	8,000
6.	Sales Expenses	3,000
7.	Miscellaneous Expenses	5,000
Total		1,09,000
Say		1,10,000

(iv) Working Capital (per month)

Sl.No	Description	Amount (In Rs.)
1.	Raw Materials	30,00,000
2.	Salaries and Wages	69,000
3.	Other Expenses	1,10,000
Total		31,79,000

(v) Working Capital (for 3 Months) (Rs.)

Working Capital for 3 months	95,37,000
Say	95,40,000

C. Total Capital Investment

a. Fixed Capital	Rs. 11,70,000
b. Working Capital for 3 months	Rs. 95,40,000
Total	Rs. 1,07,10,000
Say	Rs. 1,07,00,000

FINANCIAL ANALYSIS

(1) Cost of Production (per annum)

Sl. No.	Item	Amount (In Rs.)
a.	Recurring Expenses	3,81,48,000
b.	Depreciation on Machinery @10%	92,800
c.	Depreciation on Office Equipments, Hand Tools, Fixtures etc. @ 20%	30,000
d.	Interest on Capital Investment @ 14%	14,98,000
	Total	3,97,68,800
	Say	3,98,00,000

(2) Total Sales (per annum)	(Rs.)
By the sale of 120 M.Tons of Copper Powder @ Rs.395 kg.	4,74,00,000

(3) Profitability (per annum)	(Rs.)
4,74,00,000 – 3,98,00,000	= 76,00,000

(4) Net Profit Ratio

$$= \frac{76,00,000 \times 100}{4,74,00,000}$$

$$= 16\%$$

(5) Rate of Return

$$= \frac{76,00,000 \times 100}{1,07,00,000}$$

$$= 71\%$$

(6) Break-even Point

Fixed Cost (per annum)	(Rs.)
1. Rent	1,20,000
2. Interest on Capital Investment	14,98,000
3. Depreciation on Machinery and Office Equipment	92,800
4. 40% of Salaries and Wages	30,000
5. 40% of other expenses	3,31,000
6. Excluding rent	4,80,000
Total	25,51,800
Say	25,52,000

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

$$= \frac{25,52,000 \times 100}{25,52,000 + 76,00,000}$$

$$= 33\%$$

Addresses of Machinery and Equipment Suppliers

1. M/s. Batliboi and Co.
261, R.N. Mukherjee Road,
Kolkata-1
2. M/s. Rank and Company
A-95/13, Wazirpur Industrial
Estate,
Delhi
3. M/s. Gujarat Machinery Mfg. Ltd.
34, Churchgate Chambers,
Veer Nariman Road,
Mumbai-23
4. M/s. Bhuwaneswari Co.
4-3-313, Rashtrapati Road,
Secunderabad (A.P.)

Addresses of Raw Material Suppliers

1. M/s. R.N Shaw's Sons
27/3, Shakti Nagar,
Delhi-110007
2. M/s. Dharinsi Morarji Chemical
Co. Ltd.
317-21, Prospects Chambers,
Dr. R.N. Road, Fort,
Mumbai
3. M/s. DCM Chemical Works
P.Box No. 1211,
Najafgarh Road,
New Delhi
4. M/s. Industrial Chemical Works
23, Filter Bed Road,
Vellore-632001