Ceramic Capacitors

PRODUCT CODE	:	94389
QUALITY AND STANDARDS	:	IS 5786 (Part I):1978
MONTH AND YEAR OF PREPARATION	:	February, 2003
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Introduction

Ceramic cores for resistors are specialized ceramic material made out of steatite porcelain. These cores are in the form of rods and tubes of various diameters and length. It is manufactured by using highly pure raw materials like calcined alumina with addition of small quantity of pure clay. These are used in consumer electronic products such as radios, televisions and sophisticated electronic instruments.

Market Potential

The demand of the product is increasing day-by-day as development of electronic industry is showing upward trend. Our country has a very big concentration of electronic industries. In view of the fast development in the industrial activity in the field of electronics, the demand for the technical ceramics is ever increasing and creating wide scope for setting up new units.

Basis and Presumptions

i. It has been taken into consideration that the unit will work on single shift basis for 300 days in a year. The firing operations are, however, to be carried out continuously on three shifts basis till particular firing cycle is completed in all respects.

ii. To achieve full production 1 to 2 months trial production is required.

iii. Labour and wages are mentioned as per the prescribed Minimum Wages Act.

iv. Interest rate @ 14% on total capital investment.

v. The cost of land, construction charges, cost of machinery and equipment, raw materials, and consumables, other expenditure etc. indicated in the profile are based on the prices prevailing at the time of preparation and are

subject to necessary changes from time to time based on local conditions.

IMPLEMENTATION SCHEDULE

Sl. No.	Activity	Period (in months)
1.	Registration as SSI, site selection, processing for financial assistance.	6
2.	Procurement of machinery, their installation and trial run.	6
3.	Time required for commercial operation of the plant	6
	Total	18

TECHNICAL ASPECTS

Process of Manufacture

China clay, talc and barium carbonate are the main raw materials required for the manufacture. All the raw materials in powdered form (150 to 200 mesh) are taken in proportion and charged into the ball mill. Wet grinding is carried out by adding sufficient quantity of water. The main objective of ball mill is to get a homogenous mixture. The ground material is discharged into an agitator through an electromagnet and sieve. The slurry is then sent to the filter press where filter cakes with 18-20% water content are obtained. Filter cakes are charged into de-airing pugmill and cores are extruded by fixing the desired die. The shaped cores are dried and fired in an electric or muffle furnace at a temperature of 1300°C after which the cores are trimmed and packed for despatch.

Quality Control and Standards

IS 5798 (Part I) General requirements and methods of test.

Production Capacity

This scheme envisages manufacture of 600 MT of ceramic cores per annum of various diameters.

Pollution Control

The project does not create any noise or water pollution. The latest shuttle is more fuel efficient. The smoke emission will have to be continuously monitored as per rule.

FINANCIAL ASPECTS

A. Fixed Capital

(i) Land and Building	(Rs.)
a) Land 1000 sq. meter @Rs.600 sq. meter	6,00,000
b) Building : Built-up area workshed 400 sq. meters. @ Rs.2500 sq. mtrs.	10,00,000
Storage shed 100 sq. mtrs. @ Rs. 1500 sq. mtrs.	1,50,000
Office, Laboratory and chowkidar's cabin 200 sq. mtrs. @ Rs. 2000 sq. mtrs.	4,00,000
Compound Wall	50,000
Total	22,00,000

(ii) Machinery and Equipments

Description	Rate (Rs.)	Nos.	Total price (Rs.)
Ball mill size 1350 x1200 mm with porcelain lining, pabbles 10 HP motor, starter and accessories	75,000	3	2,25,000
Vibrating screen 10"×18"with 0.5	20,000	2	40,000
HP motor, starter and accessories Electromagnet/ permanent magnetic separator	5,000	3	15,000
Agitator capacity 1000 ltrs. with	35,000	2	70,000

Description	Rate (Rs.)	Nos.	Total price (Rs.)
3 HP electric motor and accessories			
Diaphram pump with 5 HP motor and accessories	60,000	1	60,000
Filter press, Plates 500	75,000	2	1,50,000
De-airing extruder, suitable for drawing rods/tubes of sizes 1mm to 25mm dia cap.50 kgs./hr.	1,00,000	2	2,00,000
Drying oven size 1800x1200x900mm with exhaust fan temp, controlling etc.	50,000	1	50,000
Centreless grinder, capable of trimming rods of 1 mm to 25mm with motor, starter and accessories	50,000	3	1,50,000
Weighing scale, platform type cap. 500 kgs.	12,500	2	25,000
Laboratory equipment for testing of water absorption, shrinkage and other tests		L.S.	50,000
	Total		10,35,000
Dies for various rods, tubes hand tools and other misc. equipments		L.S.	50,000
Office equipment and furniture		L.S.	50,000
Electrification and Installation		L.S.	1,00,000
Shuttle kiln with L.D.O. as fuel blower, burner and other accessories etc.		L.S.	10,00,000
	Total		22,35,000
(iii) Pre-operative expenses			1,00,000
	Total		23,35,000

Total Fixed Capital	(Rs.)
Land and Building	22,00,000
Plant and Machinery	23,35,000
Total	45,35.000

B. Working Capital (Per Month)

(i) Personnel (per month)

Description	Nos.	Salary/ month	Total (Rs.)
Works Manager	1	7,000	7,000
Technical supervisor	2	4,500	9000
Accountant/cashier	1	4,000	4,000
Operator	6	2,500	15,000
Semi-skilled workers	8	2,000	16,000
Un-skilled workers	5	1,800	9,000
Watchman/Peon	2	1750	3,500
		Total	63,500
Perquisites@15%			9,525
		Total	73,025
		or Say	73,000

(ii) Raw Material (per month)

Description	Qty.	Rate (Rs.)	Amount (Rs.)
High Alumina calcined	10MT	5,000	50,000
China clay	29MT	2,000	58,000
Ball clay	3MT	1,200	3,600
Calcite	3MT	1,400	4,200
Steatite	9MT	1,500	13,500
Binders, packing materials	L.S.		2,000
	Total		1,31,300

(iii) Utilities (per month)	(Rs.)
Average consumption of 10,000 units/months @Rs. 3/ units	30,000
L.D.O. 10,000 ltrs. @Rs. 15 ltrs	1,50,000
Total	1,80,000

(iv) Other Contingent Expenses	(Rs.)
Postage and Stationery	1,000
Telephone	2,500
Consumables stores	3,000
Repair and Maintenance	3,000
Transportation charges	2,500

Other Contingent Expenses	(Rs.)
Advertisement and Publicity	2,000
Sales expenses	4,000
Insurance	2,000
Total	20,000

(v) Total Recurring Expenditure (per month)	Rs.
Salaries	73,000
Raw materials	1,31,300
Utilities	1,80,000
Other contingent expenses	20,000
Total	4,04,300
or Say	4,04,000
Total Working Capital (on 3 months basis)	12,12,000

MACHINERY UTILIZATION

The firing is the bottleneck in this industry. The capacity utilization is considered to be 75% of the total installed capacity.

C. Total Capital Investment

Total fixed capital	Rs. 45,35,000
Total working capital	Rs. 12,12,000
Total	Rs. 57,47,000

FINANCIAL ANALYSIS

(1) Cost of Production (per annum)	Rs.
Total recurring cost	48,48,000
Depreciation on building @ 5%	80,000
Depreciation on machinery and equipment @ 10%	1,03,500
Depreciation on furnace @ 20%	2,00,000
Depreciation on moulds and fixtures @ 25%	12,500
Total interest @ 14% on fixed capital	8,04,580
Total	60,48,580

(2) Turnover (per year)

Item	Qty.	Rate	Value (Rs.)
Technical ceramics (resistor corer)	600 MT	12,000 MT	72,00,000

(3) Net Profit (per year)

= Turnover – cost of production

= Rs. 72,00,000 – 60,48,580

= Rs. 11,51,420

(4) Net Profit Ratio

$$= \frac{\text{Net profit per year x 100}}{\text{Turnover per year}}$$

$$= \frac{11,51,420 \times 100}{72,00,000}$$

= 16%

(5) Rate of Return

$$= \frac{\text{Net Profit per year x 100}}{\text{Total Investment}}$$

$$= \frac{11,51,420 \times 100}{57,47,000}$$

= 20%

(6) Break-even Point

Fixed Cost	(Rs.)
Total Depreciation	3,96,000
Total Interest	8,04,580
40% of salary and wages	3,50,400
40% of other Contingent expenses	86,400
Insurance	24,000
Total	16,61,380

B.E.P.

$$= \frac{\text{Fixed Cost x 100}}{\text{Fixed cost + Net Profit}}$$

$$= \frac{16,61,380 \times 100}{16,61,380 + 11,51,420}$$

= 59%

Addresses of Machinery Suppliers

1. M/s. Lokmanya Engg. Works
   26, Bharatkhand Cotton Mill
   Compound, Naroda Road,
   Ahmedabad-380016.
2. M/s. Jivanlal Shiv Panchal
   Opp. Old Civil Hospital,
   Gheekanta Road,
   Ahmedabad.
3. M/s. Modern Engg. and
   Fabrication Works
   Behind Kubeshwar Mahadev,
   Saijpur (Ambravadi),
   Ahmedabad
4. M/s. Bombay Furnace (P) Ltd.
   5, Sodium House,
   Veer Nariman Road,
   Mumbai-400 020.
5. M/s. Associated Industrial
   Furnace Pvt. Ltd.
   F-19, Sector XI,
   NOIDA, Ghaziabad (U.P.)
6. M/s. Electrotherma Furnace (P) Ltd.
   32, B-II Phase,
   Pooja Industrial Area,
   Bangalore.
7. M/s. Sharma Kiln Technology
   Kothmala Flat, Harekrishna
   Complex, Near Paldi,
   Ahmedabad-380 007.

Raw Material Suppliers

1. M/s. Colkem India Ltd.
   Noble House, Swaroop Nagar,
   Udaipur-313001
   (Rajasthan)
2. M/s. Gujarat Minerals
   Opp. S.T. Stand,
   Vejalpur-363 721, Taluka Kalol,
   Distt. Panchmahal
   (Gujarat)
3. M/s. Ashok Minerals and
   Grinding Ind.
   F-237-238, MIA, Modri,
   Udaipur,
   (Rajasthan)
4. M/s. Sonpura Mines and Mineral
   Suppliers
   Ravi Sarkar Pranshankar Road,
   Thangadh-363 530
   (Gujarat)
5. M/s. Tehla Ram and Sons
   Rathkhana, Bikaner,
   (Rajasthan)