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Chemical Porcelain Ware

PRODUCT CODE	:	94342
QUALITY AND STANDARDS	:	IS 7402 : 1974, 1975 IS 155011 : 1968 IS 3953 : 1966 IS 3990 : 1967 IS 454 : 1971
MONTH AND YEAR OF PREPARATION	:	January, 2003
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Introduction

Chemical Porcelain is a white vetrified dense translucent or glazed body, made of china clay, quartz, felspar, talc, alumina and additives in different shapes of thin walled items such as flat tipped basins, beakers, round rectangular capsules, combustion boats, crucibles, funnels dental dissolving cups, parting disks and discs, pipette vest spotting and dessicator plates, pipes, tubes etc, used in the laboratories of educational institutions, scientific development and industrial research, chemical, fertilizer, petro-chemical establishments etc. Due to their inherent properties like resistance to all reagents except hydrofluoric acid, resistance to thermal shock with low coefficient of expansion, good thermal conductivity and mechanical strength they have wide range of uses.

Market Potential

The demand of chemical porcelain items is ever increasing in view of extensive research and development besides growing industrial activities in the field of chemical, fertilizers and petrochemicals throughout the country. Therefore, there is wide scope for setting up new units.

Basis and Presumptions

Efficiency and working hrs. considered for full capacity utilization	75% efficiency 8hrs. working per day for 300 days a year
Time required for achieving full envisaged capacity utilization	3 months from the commencement of commercial production
Labour wages	Skilled workers

	3, 000
	Semi-skilled/ unskilled 2,400
Interest rate	14%
Margin Money	25%
Pay back period of the project	5 years
Land rate	Rs. 200 per sq. mt.
Construction rate	Rs. 2,500 per sq. mt.

Implementation Schedule

Sl. No.	*Activity*	*Period (in months)*
1.	Time required for preparation of project report	1
2.	Selection of site	½
3.	Registration of SSI	½
4.	Availability of finance	1½
5.	Construction of building	5
6.	Machinery procurement and erection	3
7.	Raw materials procurement	1
8.	Recruitment of labour	1
9.	Trial runs	10

If C.P.M. chart is drawn of the above activities, the total time taken would be about 8 months to implement the project as many activities may be completed simultaneously.

Technical Aspects

Process of Manufacture

The hard mineral powders like Quartz, Felspar etc. are ground to 200 mesh fineness and mixed with China clay, talc etc. in suitable proportions in blungers with requisite quantity of water. The slurry is passed through vibrating screen consisting of magnetic separator and stored in agitator. The slurry is then passed to filter press by diaphragm pump where it is dewatered and the body is formed into cakes. The cakes are passed through de-airing pugmill for thorough pugging and extrusion into dense homogenous plastic mass free from air bubbles. The body is then shaped into required products by pressing, casting depending upon the sizes, shapes and properties of the end product. The shaped articles are dried and biscuited at about 1000°C. After inspection the biscuited ware are suitably glazed for firing at temperature ranging from 1280°C to 1350°C. After unloading from the kiln, these are sorted out, tested and packed for marketing.

Quality Control and Standards

The Bureau of Indian Standards has formulated and published the following specifications on various chemical porcelain for guidance and maintenance of the quality of the product:

IS 5009:1969	Buchner funnels
IS 7402 (Part 1):1974	Filter container
IS 7402 (Part 2):1975	Filter candles
IS 5011:1968	Gooch Crucibles
IS 3953:1966	High temperature Ceramic combustion boats
IS 3990:1967	High temperature Ceramic combustion tubes
IS 454:1971	Perforated plates for desicators

IS 2837 (Part 1):1975 Crucibles
IS 2837 (Part 2):1977 Basins
IS 2839:1979 Methods of tests and quality.

Production Capacity

Production target (per annum)
Quantity : 1200MT
Value : Rs. 1, 41, 99, 000

Motive Power 85HP.

Pollution Control and Energy Conservation

There are no toxic effluents discharged through the waste water. However, to control dust pollution at the place of dry grinding of raw materials and mixing, it is recommended to provide cyclonic dust collector, with connecting chutes and coverage. The oil fired shuttle kiln has to be provided with high stack and modern control systems for attaining high efficiency and low discharge of toxic effluents through the kiln.

FINANCIAL ASPECTS

A. Fixed Capital

(i) Land and Building			(Rs.)
a) Land 2500 sq. mtrs. @ Rs. 200 sq. mts			5,00,000
b) Building			
Working shed 600 sq. mtrs. @ Rs. 2,000 sq. mtrs. (ACC)			12,00,000
Store, office laboratory (RCC) 200 sq. mtrs @ 2,500 sq. mtr.			5,00,000
		Total	22,00,000

(ii) Machinery and Equipments

Description	Nos.	Rate	Value (Rs.)
Ball mill 6'x 4 1/2' with porcelain lining, 10HP electric motor starter etc.	2	90,000	1,80,000
Ball mill 4'x 4 1/2' with porcelain lining 10HP electric motor starter etc.	2	60,000	1,20,000
Blunger with 5HP electric motor starter and accessories	2	70,000	1,40,000
Agitator size 5'L x 5' W x 5'D complete with 3 HP motor starter and accessories	2	50,000	1,00,000
Filterpress, chamber dia 300mm with 50 plates	1	1,50,000	1,50,000
Diaphragm pump 6" strokes 2" suction and 1 1/2 delivery with 5HP motor	1	50,000	50,000
Vibrating screen 2' x 1.5 size with 1HP motor starter etc.	2	15,000	30,000
Hydraulic press with accumulator, pipefitting, pressure gauge and accessory etc.	1	2,50,000	2,50,000
Toggle press Hand operated	7	30,000	2,10,000
Disintegrator, 18" size with 7.5HP motor, starter etc.	1	1,00,000	1,00,000
		Total	13,30,000
Electrification and Installation charges @ 10%			1,33,000
		Total	14,63,000
Tools, dies and moulds etc.		LS	1,00,000
Pollution control equipment		LS	1,00,000
Office Furniture			2,00,000
Laboratory testing equipment			1,50,000
		Total	20,13,000

Kilns	(Rs.)
Tunnel Kiln, oil fired, fiberlined (HTZ 128 modules) capacity 3.5 MT/day with equipments and storage tank	12,00,00
Total cost of machinery and equipments	32,13,000
(iii) Pre-operative Expenses	80,000

Total Fixed Capital	(Rs.)
a) Land and building	22,00,000
b) Plant and machinery	32,13,000
c) Pre-operative expenses	80,000
Total	54,93,000

B. Working Capital (Per Month)

(i) Personnel (per month)

Designation	Nos.	Salary (Rs.)	Total (Rs.)
Manager/Ceramist	1	8,000	8,000
Supervisors	2	5,000	10,000
Accountant	1	4,000	4,000
Clerk-cum-typist	1	3,500	3,500
Skilled workers	10	2,500	25,000
Semi-skilled/unskilled workers	20	2,000	40,000
Peons	2	1,500	3,000
Watchman	2	1,500	3,000
Perquisite @ 15%			14,475
	Total		1,10,975

(ii) Raw Materials (per month)

	Qty.	Rate	Value (Rs.)
Ball Clay	20MT	1,250	25,000
China Clay	50MT	800	40,000
Felspar	20MT	1,200	24,000
Quartz	20MT	1,000	20,000
Zinc/Zirconium chemical	3MT	40,000	1,20,000
Packing materials	LS	50,000	50,000
	Total		2,79,000

(iii) Utilities (per month)		(Rs.)
Power	70HP	60,000
L.D.O./ Kerosenes	21,000 ltrs Rs. 12/ltr.	2,52,000
	Total	3,12,000

(iv) Other Contingent Expenses (per month)	(Rs.)
Postage and Stationery	1,500
Telephone	2,000
Repairs and Maintenance	2,500
Transportation charge	3,000
Other overhead exp.	1,000
Insurance	2,000
Total	12,000

(v) Total Working Capital (per month)	(Rs.)
Staff and labour	1,10,975
Raw Materials	2,79,000
Utilities	3,12,000
Other Contingent expenses	12,000
Total	7,13,975
Working Capital (for 3 months)	21,41,925

C. Total Capital Investment

Fixed capital	Rs. 54,13,000
Working capital	Rs. 21,41,925
Total	Rs. 75,54,925

FINANCIAL ANALYSIS

(1) Cost of Production (per year)	(Rs.)
Total recurring cost	85,67,700
Depreciation on building @ 15%	85,000
Depreciation on machinery and equipment @ 10%	1,71,300
Depreciation on Kiln @ 20%	2,40,000
Depreciation on office equipment @ 20%	40,000
Depreciation tools, dies and moulds @ 25%	25,000
Interest on total investment @ 14%	10,57,690
Total	1,01,86,690

(2) Turnover (per year)

Item	(Rs.)
Chemical Porcelain ware 1200MT @ Rs. 11,832/MT	1,41,99,000
or Say	1,42,00,000

(3) Profitability

= Sales – cost of production

= Rs. 1,42,00,000 – 1,01,86,690

= Rs. 40,13,310

(4) Profit on Sales

$$= \frac{40,13,310 \times 100}{1,42,00,000}$$

= 28.26%

(5) Rate of Return

$$= \frac{40,13,310 \times 100}{75,54,925}$$

= 53.12%

(6) Break-even Point

Fixed Cost	(Rs.)
Total depreciation	5,61,300
Total interest	10,57,690
40% of salary	5,32,680
40% of other Contingent expenses	48,000
Insurance	24,000
Total	22,23,670

B.E.P.

$$= \frac{\text{Fixed cost} \times 100}{\text{Fixed cost} + \text{Profit}}$$

$$= \frac{22,23,670 \times 100}{22,23,670 + 40,13,310}$$

= 35.65%

Addresses of Machinery Suppliers

1. M/s. Lokmanya Eng. Works
   26/Bharatkhand Cotton Mill Compound,
   Narod Road, Ahmedabad.
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 (Ambavadi),
   Naroda Road, Ahmedabad
4. M/s. Sharma Kiln Technology
   Kothawala Flat, Harekrishna Complex, Near Paldi,
   Ahmedabad - 380007

Raw Material Suppliers

1. M/s. Gujarat Minerals
   Opp. S. T. Stand, Vejalpur - 363 721, Tal. Kalol,
   Dist. Panchmahal (Gujarat)
2. M/s. Ashok Minerals and Grinding Ind.
   F-237-238, MIA, Madri, Udaipur, (Rajasthan)
3. M/s. Sompura Mines and Mineral Suppliers
   Ravishankar Pyrnashankar Road, Thangadh, Bikaner, (Rajasthan.)