

## Plaster of Paris

PRODUCT CODE	: 21304 and 21305
QUALITY AND STANDARDS	: IS 2333:1992 IS 1288:1982 IS 4738:1998 IS 2547 (Part 1):1976 IS 2547 (Part 2):1976
PRODUCTION CAPACITY	: Quantity: 900 MT. Value : Rs. 27,00,000
MONTH AND YEAR OF PREPARATION	: January, 2003
PREPARED BY	: Small Industries Service Institute, Rajajinagar: Bangalore-560 044. Phone Nos.: 3351581-82 Fax No. : 3351583/3204018 E-Mail: sisibng@bgl.vsnl.net.in

### INTRODUCTION

Plaster of paris which is calcium sulphate with half molecule of water of crystallisation ( $\text{CaSO}_4 \cdot \frac{1}{2} \text{H}_2\text{O}$ ) possess outstanding property of setting and subsequent hardening when mixed with water. Plaster of paris is extensively used in ceramic industry for the preparation of models, moulds and plaster of toys. It is also used as a main raw material in the manufacture of toys and statues, chalk crayons, gypsum plaster boards, decorative picture frames, besides a wide range of applications in the interior decoration of buildings and other establishments.

### MARKET POTENTIAL

There is a growing industrial activity in the field of whiteware, such as pottery,

sanitaryware, chemical and electrical porcelains, requiring large quantities of plaster of paris for making moulds and preparation of moulds. The demand for the product is ever increasing. There is also considerable demand for the plaster of paris arising from a large number of shops and establishments engaged in making statues and interior decoration as well as decorative plaster boards for false ceiling etc., which is in turn creating a good scope for setting up new units.

### BASIS AND PRESUMPTIONS

1. It has been taken into consideration that the unit will work on single shift basis for 300 working days in a year.
2. Labour and wages mentioned as per the prescribed minimum wages.

3. Interest rate at @ 14% is considered in the project profile for recurring and non-recurring investment.
4. Margin money will vary from 10-25% depending upon the location and scheme adopted by the entrepreneur, i.e. self-employment or commercial scheme.
5. The costs of machinery and equipment, raw materials and consumables, other contingent expenses etc., indicated in the profile are based on those prevailing at the time of preparation. Therefore, there are subject to necessary changes from time to time based on the local conditions.
6. The break-even point is calculated on full capacity utilisation basis.
7. The unit requires 1 to 2 months trial production to achieve full capacity.

### IMPLEMENTATION SCHEDULE

It is possible to implement this project within 6 months. The following is the time schedule required for implementation:

Sl. No.	Activity	Period (in months)
1.	Project report preparation, acquisition of shed and provisional registration	2
2.	Procurement of machinery and equipment	2
3.	Installation of machinery and trial production	1
4.	Procurement of raw materials and commercial production	1

### TECHNICAL ASPECTS

#### Process of Manufacture

The raw material gypsum is sorted and washed with water for removal of sand and other impurities. The lumps thus obtained are then dried and powdered in pulverizer. The dried gypsum powder is calcined in a rotary drum-calciner using light diesel oil as fuel. The low pressure burner is used for calcination at a temperature of 160°C to 180°C. The process of calcination is done over a period of about 2 hours, so that one and half molecules of water is removed to convert the gypsum ( $\text{CaSO}_4 \cdot 2 \text{H}_2\text{O}$ ) into plaster of paris ( $\text{CaSO}_4 \cdot \frac{1}{2} \text{H}_2\text{O}$ ). After cooling the product (plaster of paris) is further pulverised to a fineness of 150 mesh and packed in air tight polythene lined gunny bags to avoid the plaster of paris from absorption of moisture. For manufacture of surgical grade plaster of paris, a mineral silinite which is considered to be a purer variety of gypsum is used.

#### Quality Control and Standards

The Bureau of Indian Standards has formulated and published the following specifications for maintaining quality of the product and testing purpose.

IS 2333:1992	Plaster of paris for ceramic industry
IS 1288:1982	Methods of tests for mineral gypsum
IS 4738:1998	Bandage plaster of paris
IS: 2547 (Part 1):1976	Gypsum building plaster including

premixed light weight plaster

IS 2547 (Part 2):1976 Gypsum building plaster including premixed light weight plaster

Production Capacity (per annum)

Qty. : 900 MTs.

Value : Rs. 27,00,000.

Motive Power 10 HP.

Pollution Control

The product does not create any noise or water pollution. The air pollution will have to be continuously monitored. Masks can be used by the workers while making powder (grinding).

Energy Conservation

General precautions saving energy particularly, the electricity and fuel are required to be followed by adopting energy conservation techniques not only to conserve the power and fuel but also to save considerable expenditure on their consumption in own interest.

## FINANCIAL ASPECTS

### A. Fixed Capital

#### (i) Land and building (Rs.)

Covered area: 2000 sq.ft. 5,000 per month  
with provision for stores, office etc., with equal open area (Rented)

#### (ii) Machinery and Equipments

Description	Qty. Nos.	Amount (Rs.)
Rotary cylindrical drum calciner capacity 2 MTs (Locally fabricated)	1 No.	65,000

Description	Qty. Nos.	Amount (Rs.)
Attsition type disc pulveriser 1/2 MT/hour with motor and other accessories	1 No.	70,000
Computer system, office furniture and equipment	-	60,000
Burner and other equipment	-	10,000
Installation and electrification charges @ 10%	-	20,500
Total		2,25,500
(iii) Pre-operative expenses such as project cost, electricity, deposits etc.		15,000
Fixed capital		
Machinery + pre-operative expenses		2,40,500
2,25,500 + 15,000 =		

### B. Working Capital (Per Month)

#### (i) Staff and Labour (per month)

Designation	No.	Salary/month (Rs.)	Total salaries (Rs.)
Manager	1	5,000	5,000
Computer operator	1	5,000	5,000
Technologist/Chemist	1	3,400	3,400
Skilled workers	3	2,000	6,000
Un-skilled workers	5	1,600	8,000
Peon/Watchman	2	1,500	3,000
Total			30,400
+ 15% perquisites			4,560
Total			34,960

#### (ii) Raw Materials (per month)

Particulars	Qty.	Rate (Rs.)	Value (Rs.)
Gypsum	107 MTs.	1000/MT	1,07,000
Woven bags polythene cover lined for packing	1500	5/bag	7,500
Total			1,14,500

(iii) Utilities (per month)	(Rs.)
Power 1600 units @ Rs.4/unit	6,400
Water	200
Light diesel oil –1500 litres @ Rs.14/litre	21,000
Total	27,600

(iv) Other Contingent Expenses (per month) (Rs.)	
Rent	5,000
Postage, stationery and telephone	2,000
Repairs and maintenance	500
Transport charges	1,000
Other misc. expenses	2,000
Total	10,500

(v) Working Capital (per month)	(Rs.)
Staff and labour	34,960
Raw materials	1,14,500
Utilities	27,600
Other contingent expenses	10,500
Total	1,87,560

(vi) Working Capital (for 3 months) 5,62,680

### C. Total Capital Investment

Fixed capital	Rs. 2,40,500
Working capital for 3 months	Rs. 5,62,680
Total	Rs. 8,03,180

## FINANCIAL ANALYSIS

(1) Cost of production (per annum)	(Rs.)
Total recurring expenses	22,50,720
Depreciation on machinery and equipment @ 10%	8,000
Depreciation on calciner, computer system and office furniture @ 20%	25,000
Interest on total capital investment @ 14%	1,12,445
Total	23,96,165

(2) Turnover (per annum)	(Rs.)
Sale of 900 MTs. of plaster of paris @ Rs.3000/MT	27,00,000

(3) Net Profit (per year) (Before Income tax)

$$\begin{aligned}
 &= \text{Turnover} - \text{Cost of production} \\
 &= \text{Rs. } 27,00,000 - 23,96,165 \\
 &= \text{Rs. } 3,03,835
 \end{aligned}$$

(4) Net Profit Ratio

$$\begin{aligned}
 &= \frac{\text{Net profit per year} \times 100}{\text{Turnover per year}} \\
 &= \frac{3,03,835 \times 100}{27,00,000} \\
 &= 11.25 \%
 \end{aligned}$$

(5) Rate of Return

$$\begin{aligned}
 &= \frac{\text{Net profit per year} \times 100}{\text{Total capital investment}} \\
 &= \frac{3,03,835 \times 100}{8,03,180} \\
 &= 37.83 \%
 \end{aligned}$$

(6) Break-even Point

(i) Fixed cost	(Rs.)
Depreciation on machinery and equipment	8,000
Depreciation on calciner, computer system and office furniture	25,000
Interest on total capital investment	1,12,445
Rent	60,000
40% of salary and wages	1,67,808
40% of other contingent expenses	26,400
Total	3,99,653

(ii) Net profit (per year) 3,03,835

$$\begin{aligned}
 \text{B.E.P.} &= \frac{\text{Fixed cost} \times 100}{\text{Fixed cost} + \text{Profit}} \\
 &= \frac{3,99,653 \times 100}{3,99,653 + 3,03,835} \\
 &= \frac{3,99,65,300}{7,03,488} \\
 &= 56.8\%
 \end{aligned}$$

### Addresses of Machinery and Equipment Suppliers

1. M/s. Amic Industries  
10, BT Road,  
Kolkata-36.

2. M/s. Durgapur Engineering Co. Ltd.  
Marshal House,  
33/1, Netaji Subhas Road,  
Kolkata-700001.
3. M/s. Wesman Engineers Co. (P) Ltd.  
1/2, Allerby Road,  
Kolkata-20.
4. M/s. Continental Thermal  
Engineers  
806, II Stage, 4th Main,  
A Block, Rajajinagar,  
Bangalore-10.
2. M/s. Shri Venkateswara Products  
Vadaku Venganallur,  
Opp. Raju's College,  
Mudangiar Road,  
Rajapalyam, (Tamil Nadu.)
3. M/s. Andhra Pradesh Mining  
Corporation  
6-3-672, Punjagutta,  
Hyderabad-82.
4. M/s. Madras Mineral Suppliers  
No.2/10, Toovipuram,  
Tuticorin-3  
(Tamil Nadu).

#### Raw Material Suppliers

1. M/s. Mysore Minerals  
39, MG Road,  
Bangalore-1.
5. M/s. TAMIN  
9, Anderson, Habibulla Avenue,  
Chennai-4.