

Burnt Lime (With Oil Firing and Pollution Control System)

PRODUCT CODE	: 21126, 21127 and 21131
QUALITY AND STANDARDS	: IS 1886 : 1961 IS 712 : 1973 IS 1624 : 1974
PRODUCTION CAPACITY	: Quantity : 9, 000 M.T. (per annum) Value : Rs. 2, 02, 50, 000
MONTH AND YEAR OF PREPARATION	: January, 2003
PREPARED BY	: Small Industries Service Institute 10, Pologround, Industrial Estate Indore – 452 015 (M.P) PBX: 421540, 421659 Fax: (0731) 420723 Modem: (0731) 421047 E-mail : sisiind@bom4.vsnl.net.in

INTRODUCTION

Burnt Lime also called as quick lime or unslaked lime is made out of lime stone deposits which are wide spread throughout the country. The burnt lime is extensively used as a mortar in the construction of building by mixing in with suitable proportion of sand and surkhee of burnt clay as aggregate. It is also used for white washing of houses and building. Iron and steel plants, and foundries use lime as a fluxing agent in considerable quantity. Some drugs and pharmaceuticals, paper industry, pesticides formulations and other chemical processing industries are using the unslacked lime.

MARKET POTENTIAL

There is rapid development taking place in the construction of buildings in rural and urban areas housing development programmes and industrialisation activities throughout the country, burnt lime has a good demand. The main application of lime, used as a mortar in the construction of building, by mixing it in suitable ratio with sand and surkhee of burnt clay, white washing of house and buildings, iron and steel industries, fluxing agent in foundries, drugs paper and pharmaceuticals industries, some chemical industries are also using the lime as a chemical processing agent. The demand for this

product is also increasing day-by-day. In the view of this, there is a very good scope for setting up some new units.

BASIS AND PRESUMPTIONS

- i. The Proposed unit will carry out lime calcination about 30 Tonne/day (30 TPD), on single shifts basis, having 300 working days in a year.
- ii. Annual expenses such as salary and wages other contingent expenses have been calculated for 12 months.
- iii. It is expected that the unit will achieve its full capacity during the first year of operation itself.
- iv. The wages proposed in this profile are per the prevailing wages practice. The staff and labour have been taken on the basis of minimum applicable.
- v. Normal rate of interest of about 14% is considered both for recurring and non-recurring investment.
- vi. Margin money is generally @ 10-25% and however it varies according to the location and the project and the rules of financial institutions.
- vii. The normal operative period it estimated to be more than 15 years considering the present level Technology. The usual repayment period of loan is about three years.
- viii. The term loan varies from one financial institution to another and general minimum gestation period is 6 months and it could be extended upto two years. Maximum period for repayment of loan would be less than four years including gestation period.
- ix. The production capacity of the plant and machinery would be 60% in the first year, 70% in the second year and 80% in the third year respectively.
- x. The land value and construction cost has been taken on average basis, as it varies from place to place.
- xi. The cost of machinery and equipment as proposed in the project profile may vary from place to place consulting the local machinery suppliers and traders and varies from place to place at the time of preparation of this project.

IMPLEMENTATION SCHEDULE

Sl. No.	Activity	Period		
		Starting		Completion
1.	Survey, for collection of data in respect of demand, raw material, including power, fuel, available of technology, pollution control	0	to	2nd month
2.	Arrangement of margin money	2nd	to	3rd month
3.	Preparation of project document and registration	2nd	to	3rd month

Sl. No.	Activity	Period		
		Starting		Completion
4.	Financial assistance	4th	to	6th month
5.	Selection of site and development of land	4th	to	6th month
6.	Clearance for pollution electricity, fuel and water, tie up for availability	5th	to	7th month
7.	Construction/selection of machine identification	6th	to	7th month
8.	Placement of order for machinery	6th	to	9th month
9.	Transportation and installation of machinery and equipments	6th	to	10th month
10.	Selection of raw material and replacement of orders	8th	to	11th month
11.	Receipt of raw material	9th	to	11th month
12.	Installation of machinery etc.	10th	to	11th month
13.	Trial production			12th month

TECHNICAL ASPECTS

Process of Manufacture

The limestone mined from quarry or rivers should be free from all defects and impurities, once washed and cleaned again for removal of dust particles. These stone blocks are crushed manually or by jaw crusher in sizes of 3 to 6 inches. Oil fired vertical shaft kiln (VSK) refractory lining inside portion having about 33 metre conical vertical chimney, is used for the firing or calcination of lime stone at a temperature of about 900° C. The chimney of VSK is so arranged that the speed of exhaust gases and fumes in the chimney may travel @ 9 to 12m/sec. The diameter of chimney is so calculated that the lower/bottom portion of chimney is one third of the total stack of chimney. Skip bucket with rope, which is driven by electric motor, is arranged for loading of stone

pieces for firing of calcination. These stone pieces are loaded from the top of kiln, this process is done regularly as per the requirement of stone calcination. A cyclone or dust catcher is also arranged with a scrubber which collect about 50 to 80% dust particles and removed with scrubber. Approx. 4 kg. 6 kg. sludge/hr. is removed by this process which can be discharged to land fill. The firing is done with the help of burner. The firing is initiated from the bottom section of kiln and after a suitable interval the calcined lime is unloaded through the outlets provided at the bottom section of kiln. Property calcined lime is sorted out in different grades like A, B and C grade. Semi burnt lime stones are charged again in the kiln for calcination. The dust, clinkers ash and other harmful materials are removed from the finished product properly sorted lime is packed and stored for sale.

Quality Control and Standards

The Bureau of Indian Standards has formulated and published the following specifications for the necessary guidance and maintenance for the quantity of different types of lime product.

IS 1861:1961 Lime in vertical mixed feed type kilns and its manufacture

IS 712:1973 Methods of testing for building lime

IS 1624:1974 Fields testing and building lime and mortars

Production Capacity (per annum)

The production capacity envisaged in this project is about 8, 000 MT, valued at Rs. 1, 35, 38, 428 per annum.

Motive Power

Approximate 36000 KWH per annum power will be required.

Pollution Control

The project does not create any noise or water pollution, proper dust collector or cyclones arranged with a dust scrubber system to control 50% to 80% dust. The oil fired vertical shaft kiln having 33 meters height of removes all types of flue gases and smokes very easily and does not create any dust/air pollution. However, necessary clearance or NOC is to be obtained from the state pollution Control Board. Eye goggles and hand gloves may be used during the working hours.

Energy Conservation

Properly insulated and refractory lined furnace fuel on account of energy conservation. The oil fired furnace has better combustion control facilities which helps in saving energy from 30%

to 40% when compared to conventional coal fired shaft furnaces.

- i) Machinery and equipments should be lubricated properly at regular intervals as per the schedule.
- ii) All the plugs may be kept off, when the electricity is not required.
- iii) The belts on pulleys may be tightened properly during the working process.
- iv) The layout of the plant should be maintained systematically.

FINANCIAL ASPECTS

A. Fixed Capital

(i) Land and Building	(Rs.)
Land area-one acre	6,50,000
Office and work shed area-300 sq. mtrs.	2,95,000
Store, Workshop, Laboratory area about 100 sq. mtrs.	2,75,000
Boundary wall, MS Gate, vehicle's stand, time office etc.	80,000
Total	13,00,000

(ii) Machinery and Equipments (All Indigenous)

Sl. No.	Description	Qty. (No.)	Value (Rs.)
<i>(a) Production Unit</i>			
1.	Oil fired vertical shaft kiln with Refractory lining inside portion of kiln having 33 metre height chimney made of steel Fabricated plate form type having all arrangement with skip bucket and burners etc. Capacity-30 Tonne per day	1 No.	5,00,000
2.	Jaw crusher for crushing the stone or pebbles with 10 HP motor and starter etc.	1 No.	75,000
3.	Rotary self-driven for sieving the lime having different mesh sizes with 1.5 HP motor and starter etc.	1 No.	40,000

Sl. No.	Description	Qty. (No.)	Value (Rs.)
4.	Wheel barrow for handling of raw material and finished product	4 Nos.	60,000
5.	Balance for weighing upto 500kg.	2 Nos.	6,000
6.	Overhead water tank; capacity 1000 litres. Water storage having well boring jet with 2 HP motor and starter, and pipe line fitting etc.	1 No.	30,000
7.	Beg sewing machine	1 No.	30,000
8.	Generator set capacity 10 kVA	1 No.	50,000
9.	Other tools, fixtures, dies, hand tools, racks etc.	L.S.	20,000
	<i>(b) Testing Equipments</i>	L.S.	10,000
	<i>(c) Pollution Control Equipments</i>		
	Exhaust Fan	5 Nos.	15,000
	Dust cotcher	1 No.	40,000
	Scrubber	1 No.	1,80,000
	Ducting	L.S.	15,000
	Fencing for plantation	L.S.	30,000
	Hand gloves, eye goggles etc.	L.S.	10,000
	<i>(d) Energy Conservation Equipments</i>	L.S.	10,000
	<i>(e) Electrification and Installation @ 10% on machinery and equipments</i>		1,12,000
	<i>(f) Cost of office furniture and equipment like working tables, chair, Almirah and cash box etc.</i>	L.S.	50,000
	Total cost of machinery and equipments (a+b+c+d+e+f)		12,83,000
	(iii) Pre-operative Expenses		50,000
	Total Fixed Cost (i+ii+iii)		26,33,000

B. Working Capital (per month)

(i) Staff and Labour (per month)

Description	Nos.	Salary (Rs.)	Total (Rs.)
<i>(a) Administrative Staff</i>			
Manager-Cum-Technical Expert	1	7,000	7,000
Supervisor	1	4,000	4,000
Clerk-Cum-Cashier	1	3,500	3,500
Store Keeper	1	3,000	3,000

(b) Technical (Skilled and Unskilled Workers)

		Salary (Rs.)	Total (Rs.)
Skilled workers	4	3,000	12,000
Semi-skilled workers	4	2,500	10,000
Unskilled workers	6	2,200	13,200
Peon	1	2,000	2,000
Chowkidar	1	2,000	2,000
	Total		56,700
	+15% perquisites on salary		8,505
	Total		65,205

(ii) Raw Material (per month)

Sl. No.	Particular	Qty. (MT)	Rate (Rs.)	Value (Rs.)
	Lime stone blocks (including transport charges)	800 M.T.	250	2,00,000
	Packing material like gunny bags etc.	L.S.	L.S.	5,000
	Total			2,05,000

(iii) Utilities (per month)

Sl. No.	Particular	Qty.	Rate (Rs.)	Value (Rs.)
i.	Power	3000 kWh	3.75	11,250
ii.	Fuel/Furnace oil	75 KL.	7,000	5,25,000
iii.	Water	L.S.	L.S.	850
	Total			5,37,100

(iv) Other Contingent Expenses (per month) (Rs.)

Postage and Stationery	1,000
Advertisement and Publicity	3,000
Repair and Maintenance	500
Telephone	500
Consumable store	500
Travelling and Local expenses	1,000
Sales expenses	3,000
Insurance	3,000
Misc. expenses	1,500
Total	14,000

(v) Total Working Capital (per month) (Rs.)

Staff and Labour	65,205
Raw material	2,05,000
Utilities	5,37,100
Other Contingent expenses	14,000
Total	8,21,305
Working Capital for 3 months	24,63,915

C. Total Capital Investment

Fixed capital	Rs. 26,33,000
Working capital for 3 months	Rs. 24,63,915
Total	50,96,915

FINANCIAL ANALYSIS**(1) Cost of Production (per annum) (Rs.)**

Total recurring cost per annum	98,55,660
Depreciation on building @ 5%	32,500
Dep. on kiln @ 20%	1,00,000
Dep. on machinery and equipments. @ 10%	71,700
Dep. on tools fixture, dies, racks @ 25%	5,000
Dep. on office furniture and equipments. @ 20%	10,000
Interest on total capital investment @ 14%	7,13,568
Total	1,07,88,428

(2) Turnover (per annum)

Sl. No.	Product	Qty. (MT.)	Rate (Rs.)	Value (Rs.)
	Burnt Lime	8000	1692	1,35,36,000

(3) Net Profit (per annum)

$$= \text{Total Turnover} - \text{Cost Production}$$

$$= \text{Rs. } 1,35,36,000 - 1,07,88,428$$

$$= \text{Rs. } 27,47,572$$

(4) Net Profit Ratio (per annum)

$$= \frac{\text{Net Profit} \times 100}{\text{Total Turnover}}$$

$$= \frac{27,47,572 \times 100}{1,35,36,000}$$

$$= 20.3\%$$

(5) Rate of Return (per annum)

$$= \frac{\text{Net Profit} \times 100}{\text{Total capital investment}}$$

$$= \frac{27,47,572 \times 100}{50,96,915}$$

$$= 53.91\%$$

(6) Break-even Point

Fixed Cost (per annum)	(Rs.)
Total depreciation	2,19,200
40% of Staff and Labour	3,12,984
40% of utilities and Other Contingent expenses (excluding insurance)	26,30,880
Insurance	36,000
Interest @ 14%	7,13,568
Total	39,12,632

B.E.P.

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

$$= \frac{39,12,632 \times 100}{39,12,632 + 27,47,572}$$

$$= 58\%$$

Addresses of Machinery
and Equipment Suppliers

1. M/s. Khadi and Village Industries
Commission
No. 6, Dr. D.V. Gundappa Road,
Gandhi Bazar,
Basavanagudi,
Bangalore-4
(Kiln)
2. M/s. Amic Industries
10, B. T. Road,

Kolkata – 56
(M/C)

3. M/s. Keshab Machineries Pvt. Ltd.
Bose Park,
Sukchar,
24 Parganas
(West Bengal)

Raw Material Suppliers

All the raw materials are locally
available.