

## **MINERAL GRINDING**

### **1. INTRODUCTION**

Varieties of mineral resources are located in various parts of the country. The details on available minerals, their chemical analysis, probable results and current utilization pattern data may be available from the respective state Geology & Mining dept. In this project file, mineral grinding of mainly used minerals is covered for preparation of project profile. The main minerals covered are bauxite, soap stone, calcite, kaolin, ball clay and china clay. The grinding of minerals is done using locally available equipment such as pulverize, material handling equipment, sieving machines, packing machines, etc. It is assumed that the average production capacity will be 3000 MT per annum.

### **2. PRODUCTS AND ITS APPLICATION**

The grinding of natural minerals results in powder of different particle sizes, mainly measured as mesh size. Such powder minerals according to specifications and particle size are widely used in ceramic, glass, chemical, refractory, paint, plastic, rubber and large number of other industries such as paper and washing material manufacturing.

The powdered minerals are also exported outside India depending on the price parity, freight and chemical constituents. As India is having almost all major minerals, it is mostly self-sufficient except specialty minerals such as phosphoric and potash.

### **3. DESIRED QUALIFICATION FOR PROMOTER**

Mineral grinding is a simple process and not much technical complexity involved. Therefore, motivated person with good communication skill to sell end products to industries will be a preferred promoter. However, some experience in mineral products will help in understanding raw materials & applications.

#### **4. MARKET POTENTIAL AND MARKETING ISSUES, IF ANY**

The market for powdered minerals is almost everywhere in the country as most of the industries are using one or another kind of mineral. It is important to do market survey of local area to identify minerals used by the industries. The market will vary according to the concentration of the particular type of industry such as ceramic and glass. . In fact, it is important to link available local minerals with market as transportation of minerals is cost effective only if grinding and consumption are in nearby areas. Most minerals are high in volume and low in cost. Therefore, economical radius of transporting raw material and finished product become very important.

With rapid industrialization and rising exports of finished products, demand for powdered minerals is ever increasing. The main exportable minerals are bauxite, soap stone, iron ore and kaolin

#### **5. RAW MATERIAL REQUIREMENTS**

The main raw materials are in the form of mineral lumps obtained from respective mines. For the purpose of this profile, bauxite is taken as raw material and this can be changed according to the available mineral in the local area. Most of mineral grinding activity is carried out with multiple minerals. This can be done by changing raw material as most of the plant & machinery remain same. Therefore, one can utilize locally available minerals for grinding and sell in the nearby market. It is important to note that the same mineral has different chemical analysis in different locations. The price is also varying based on percentage of element required for end application.

To assess the availability of raw material, it is important to get information from State Directorate of Geology & Mining and also from existing mine owners of respective minerals,

## 6. MANUFACTURING PROCESS

It is simple but needs careful handling of equipment in order to prevent breakdown. Various minerals are assorted in batches. Then it is fed to the grinding unit where lumps are converted into powder. The particle size obtained as a result of grinding will depend on the screen used to sieve mineral. The grinding efficiency will depend on the hardness of the mineral. Therefore, production will vary according to hardness. The softer mineral such as soap stone will give high production compared to bauxite in the same machine.

After powdering minerals, it is passed through vibratory screens, magnetic separator and sieving using cyclone separator to obtain different particle sizes of the product. Higher mesh size will fetch higher price. Powdered minerals are normally packed in HDPE woven bag. Sometimes, used bag are also used for packing to reduce cost if that is acceptable to the buyer.

## 7. MANPOWER REQUIREMENT

At full capacity, following manpower will be required for day-to-day operation of the plant and office work:

### Manpower Requirement

| Sr. No. | Designation of Employees | Monthly Salary<br>₹ | Number of employees required | Value<br>Rs. in lacs |
|---------|--------------------------|---------------------|------------------------------|----------------------|
| 1       | Supervisor               | 12,000              | 1                            | 1.44                 |
| 2       | Skilled man power        | 5,000               | 5                            | 3.00                 |
| 3       | Sales Man                | 7,000               | 1                            | 0.84                 |
| 4       | Accountant               | 7,000               | 1                            | 0.84                 |
| 5       | Office boy               | 3,500               | 1                            | 0.42                 |
| 6       | Unskilled man power      | 4,000               | 8                            | 3.84                 |
|         | <b>Total</b>             |                     | 17                           | 10.38                |

## 8. IMPLEMENTATION SCHEDULE

The time required to implement 3000 MT/annum mineral grinding unit will be six months from the date of arranging the finance. It is desirable to identify land at early stage as requirement of open land is more for such activity to store raw materials.

## 9. COST OF PROJECT

The cost of project as per market rate of factory building, machinery, miscellaneous items, working capital margin and preliminary and pre-operative expenses works out as under.

### Cost of Project

| Sr. No. | Particulars                         | ₹ in Lacs    |
|---------|-------------------------------------|--------------|
| 1       | Land                                | 10.00        |
| 2       | Building                            | 25.00        |
| 3       | Plant & Machinery                   | 35.75        |
| 4       | Furniture, Electrical Installations | 4.00         |
| 5       | Other Assets                        | 0.50         |
| 6       | Margin for Working Capital          | 4.89         |
|         | <b>Total</b>                        | <b>80.14</b> |

## 10. MEANS OF FINANCE

Based on the present norms of the bank, means of finance is worked out as under.

### Means of Finance

| Sr. No. | Particulars             | ₹ in Lacs           |
|---------|-------------------------|---------------------|
| 1       | Promoter's contribution | 24,04,200.00        |
| 2       | Bank Finance            | 56,09,800.00        |
|         | <b>Total</b>            | <b>80,14,000.00</b> |

## 11. WORKING CAPITAL CALCULATION

Working capital required for storage of raw materials and finished goods, monthly overheads, goods in process, receivables and trade credit is worked out based on the present norms of the bank as under.

### Working Capital Calculations

| Sr. No. | Particulars  | Gross Amt.   | Margin % | Margin Amt. | Bank Finance |
|---------|--------------|--------------|----------|-------------|--------------|
| 1       | Inventories  | 1.50         | 40%      | -           | 1.50         |
| 2       | Receivables  | 10.00        | 40%      | -           | 10.00        |
| 3       | Overheads    | 1.77         | 50%      | -           | 1.77         |
| 4       | Creditors    | -1.50        | 40%      | -           | -1.50        |
|         | <b>Total</b> | <b>11.77</b> |          | <b>-</b>    | <b>11.77</b> |

## 12. LIST OF MACHINERY REQUIRED

The main items of machinery are jaw crusher, pulverizer, vibratory screen, magnetic separator, testing instruments, material handling equipment, cyclone separator and weighing machine. All these items are available in India. It is also easy to repair and maintain proposed machinery with help of local fabricator.

## 13. PROFITABILITY CALCULATIONS

The profitability is worked out as under after taking into account all variable and fixed expenses as under.

### Profitability Calculations

| Sr. No. | Particulars                         | Year 1       | Year 2       | Year 3       | Year 4       | Year 5       |
|---------|-------------------------------------|--------------|--------------|--------------|--------------|--------------|
| 1       | Sales                               | 84           | 96           | 108          | 108          | 108          |
| 2       | Raw Materials & Other direct inputs | 48.258       | 55.152       | 62.046       | 62.046       | 62.046       |
| 3       | Gross Margin                        | 35.742       | 40.848       | 45.954       | 45.954       | 45.954       |
| 4       | Overheads except interest           | 7.448        | 8.512        | 9.576        | 9.576        | 9.576        |
| 5       | Interest                            | 0.63         | 0.72         | 0.81         | 0.81         | 0.81         |
| 6       | Depreciation                        | 3.801        | 4.344        | 4.887        | 4.887        | 4.887        |
| 7       | <b>Net Profit before tax</b>        | <b>23.87</b> | <b>27.28</b> | <b>30.69</b> | <b>30.69</b> | <b>30.69</b> |

## 14. BREAKEVEN ANALYSIS

The Break-Even point as percentage of targeted sales works out as under.

### Cash Break-Even (as % of Targeted sales)

| Sr. No. | Particulars                   |          | Value         |
|---------|-------------------------------|----------|---------------|
|         |                               |          | <b>Year-1</b> |
| 1       | Sales Realization             | Rs. Lacs | 120.00        |
| 2       | Variable costs                | Rs. Lacs | 68.94         |
| 3       | Fixed costs incl. interest    | Rs. Lacs | 10.64         |
| 4       | $BEP = FC/SR-VC \times 100 =$ |          | 20.85%        |