**BLEACHING POWDER**

**Introduction:**
Bleaching powder also known as chlorinated lime is a yellowish-white powder easily soluble in water. The chlorine content of bleaching powder varies from 35 – 40%. If temperature of lime kept between 30°C – 40°C bleaching powder with available chlorine upto 40% is obtained. It is not hygroscopic, if kept under 40°C. It is mainly used as a bleaching agent and as a disinfectant. The major use of bleaching powder is in paper industry, textile industry and oil industry. It is also used in all chemical industry where bleaching is required.

**Market Potential:**
The principal consumers of bleaching powder are paper industries, textile industries, oil installation, fertilizer units, tea gardens, PHE, railway, hospitals and municipal corporations. It has been estimated that the requirement of bleaching powder in entire N.E. Region is around 3500 MT per annum.

**Plant Capacity:**
The production basis for a typical tiny unit would be as under:

- **Working hours/day**: 8 (1 shift)
- **Working days in a year**: 300
- **Annual Production capacity**: 300 MT bleaching powder.

The unit has been assumed to operate at 70%, 80% and 90% of its installed capacity in the first, second and third year and onwards of its operation.

**Raw Material:**
The two main raw materials required for the manufacture of bleaching powder are high grade lime and chlorine. Chlorine is available as a by product during the electrolysis of brine. When lime is processed with chlorine it has to be free from hydrogen to avoid explosions in the reaction chamber. The lime quality used is utmost importance. Generally lime which has a CaO content of around 95% which slakes readily to yield a large volume of slaked lime (over 3 times the volume of CaO used) is employed. It should contain less than 2% of carbonate, 0.5% of iron oxide and no cobalt or manganese. The lime after slaking should be stored for some time before use and its moisture content may be 4%. The raw materials required for the unit are as follows:

- Lime : 400 MT/Yr.
- Chlorine : 200T/Yr

**Process:**
The process of manufacture of bleaching powder is as per Hasen Clever Process of manufacturing Bleaching Powder.

In this process there are cast iron cylinders operating in series with hydrated lime and chlorine being fed counter current to each other. The cylinders are provided with rotating blades and are arranged horizontally one above the other the rotating blades act both as mixed and conveyors of the inside mass. Hydrated lime is charged at one end of the top most cylinder while chlorine is introduced at the other end of bottom most cylinder with the rotation of the blades there is an intimate mixing of chlorine and lime with simultaneous movement of slaked lime counter current to chlorine gas. The chlorinated lime is discharged from the bottom cylinder and the un-reacted chlorine is recovered from the top cylinder and recycled along with the fresh chlorine. The bleaching powder discharged is stored in cast iron drums and wood barrels. To increase the storage life it is mixed with quick lime to yield tropical bleach containing 25% of available chlorine.

**Machinery:**
The major equipment required by the unit for manufacturing bleaching powder are as follows:

- Chlorinator with separator, agitator : 2 Nos.
- Reduction gear box : 2 Nos.
- Slip ring motor : 2 Nos.
- Chain & pulley block : 1 No.
- Laboratory equipment:
  - Lime storage tank : 1 No.
  - Water pump : 2 Nos.
  - Vacuum pump with motor : 2 Nos.
**Location:**
The suitable locations for the project may be –
1. Guwahati, Tinsukia, Tezpur in Assam.
2. Dimapur in Nagaland.
4. Kolasib in Mizoram
5. Agartala in Tripura

**Infrastructure:**
The basic infrastructure required are:
- Land: 3,000 sq.ft.
- Building: 1,500 sq.ft.
- Power: 20 KW
- Water: 5,000 Ltr. Per day.
- Manpower: 11 Nos. (Administrative (4), Factory Staff (7),

**Total Capital Requirement:**
The total capital requirement including fixed capital and working capital is estimated at Rs 21.10 lakhs as follows. Of this, the project cost comprising fixed capital and margin money on working capital is Rs 18.30 lakhs.

**A. Fixed Capital:**

<table>
<thead>
<tr>
<th>Item</th>
<th>(Rs in lakh)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Land</td>
<td>1.00</td>
</tr>
<tr>
<td>Building</td>
<td>5.50</td>
</tr>
<tr>
<td>Machinery</td>
<td>6.50</td>
</tr>
<tr>
<td>Miscellaneous fixed assets</td>
<td>2.00</td>
</tr>
<tr>
<td>Preliminary and pre-operative expenses</td>
<td>1.50</td>
</tr>
<tr>
<td><strong>Total (A)</strong></td>
<td><strong>16.50</strong></td>
</tr>
</tbody>
</table>

**B. Working Capital:**

<table>
<thead>
<tr>
<th>Item</th>
<th>(Rs in lakh)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Raw materials &amp; Packing material</td>
<td>1 month 1.75</td>
</tr>
<tr>
<td>Finished goods</td>
<td>2 weeks 1.50</td>
</tr>
<tr>
<td>Working expenses</td>
<td>1 month 0.60</td>
</tr>
<tr>
<td>Receivables</td>
<td>1 week 0.75</td>
</tr>
<tr>
<td><strong>Total (B)</strong></td>
<td><strong>4.60</strong></td>
</tr>
</tbody>
</table>

**Total (A)+(B) 21.10**

**Note:** Working capital may be financed as:
- Bank Finance: ..... Rs 2.80 lakhs
- Margin Money: ..... Rs 1.80 lakhs
- **Rs 4.60 lakhs**

**Means of Finance:**
The project cost of Rs 18.30 lakhs including margin money for working capital may be financed as under:
- Promoter’s contribution (35%) : ..... Rs. 6.40 lakhs
- Term Loan (65%): ..... Rs 11.90 lakhs
- **Rs 18.30 lakhs**

**Operating Expenses:**
The annual operating expenses are estimated at Rs 21.45 lakhs (70% capacity utilization) as given below:

<table>
<thead>
<tr>
<th>Item</th>
<th>(Rs in lakhs)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Raw materials</td>
<td>12.50</td>
</tr>
<tr>
<td>Utilities</td>
<td>0.50</td>
</tr>
<tr>
<td>Wages &amp; Salaries</td>
<td>4.80</td>
</tr>
<tr>
<td>Overheads</td>
<td>0.40</td>
</tr>
<tr>
<td>Selling expenses @ 2.5% on annual sales</td>
<td>0.70</td>
</tr>
<tr>
<td>Interest on term loan(13.50%)</td>
<td>1.60</td>
</tr>
<tr>
<td>Interest on Bank Finance for Working Capital(12.75)</td>
<td>0.40</td>
</tr>
<tr>
<td>Depreciation @10%</td>
<td>0.65</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td><strong>21.45</strong></td>
</tr>
</tbody>
</table>
Sales Realization:
The basis on which average ex-factory sales realization from the sale of bleaching powder at 100% capacity utilization is as follows:

<table>
<thead>
<tr>
<th>Items</th>
<th>Qty.</th>
<th>Unit Sales Price (Rs)</th>
<th>Annual Sales Price (Rs)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Bleaching Powder</td>
<td>300 MT</td>
<td>12,000/MT</td>
<td>36,00,000</td>
</tr>
</tbody>
</table>

Based on this the annual sales realization is estimated to be Rs 36.00 lakhs and at 70% capacity utilization the same is Rs 25.20 lakhs.

Profitability:
Based on the sales realization and the operating expenses, the profit would be Rs 3.75 lakhs per year (70% capacity utilization). This works out to a return on investment of 26%. The plant will break even at 44% of the rated capacity.

Highlight:
The major highlights of the project are as follows:
- Total capital requirement: Rs 21.10 lakhs
- Promoter’s contribution: Rs 6.40 lakhs
- Annual sales realization (70% cap.): Rs 25.20 lakhs
- Annual operating expenses (70% cap.): Rs 21.45 lakhs
- Annual profit (pre-tax): Rs 3.75 lakhs
- Pre-tax Return on Sales: 17%
- Break Even Point: 44%
- No.of persons employed: 11

List of Machinery Suppliers:
1. M/s (Alum.) Mars Design Pvt.Ltd.
   P-142, Lake Road,
   Kolkata – 700 029

2. M/s The Dharamsi Morarji Chemicals Co.Ltd.
   Regent Chamber, (8th Floor)
   208, Nariman Point,
   Mumbai – 400 021

List of Raw Materials Suppliers:
1. M/s Indo Chem. Pharma Inc.
   Subhash Chambers,
   2nd Floor, Kumpta Street,
   Bariad Estte,
   Mumbai – 400 001

   240 Dr. D.N. Road,
   Mumbai – 400 001

3. M/s DCm Chemicals Works,
   P.B. No. 1211, Najafgarh Road,
   New Delhi – 110 015.