Budget data and technical information for a

Wood Wool Cement Board (WWCB) Plant

The data below provides information on the two most common WWCB plant types as provided by Eltomanation, which are:

A. Fully Automated WWCB Plant (incl. full Finishing Line).
B. Expandable (semi-automated) WWCB Plant.

Both Plant types are provided with the ELTOMATIC Rotating Wood Wool Machine, which allows the production of high-quality boards at high capacity.

The Fully Automated WWCB Plant allows for the production of the full range of WWCB products, which includes standard WWCB, (spray-painted) acoustic ceiling panels (usually made with white cement), Composite WWCB (with a core of EPS, XPS or Rockwool) and Reinforced WWC Roofing Boards.

This advanced Production Line is provided with a full "Finishing Line", which includes a Board Dryer, Thickness Calibrator, Trimming & Profiling Saw and a Spray Painting Line with dryer. All destacking and stacking of boards is done fully automated.

Optional to such Fully Automated WWCB Plant we can provide our Clients with a so-called “Expandable WWCB Plant”. Such Expandable Plant includes the main production line, however does not have the full "Finishing Line", nor all of the automatic handling equipment. At a later stage, more equipment can be added, to increase the product range and reduce the labour requirements. This line is therefore more suitable for clients, where labour costs are low to modest and the market for the board still needs to be developed.

Eltomanation will closely work with each Client to offer the best suitable “custom made” WWCB plant configuration in view of grade of automation, layout and labour requirements.

Board dimensions:
The following board dimensions apply:

- **Length:** 2400 / 2440 mm (8'), when so required up to 3050 mm (10')
- **Width:** 600 / 610 mm (2')
- **Thickness:** 15 - 100 mm for solid WWCB
  (up to 150 mm Composite WWCB)
Board densities:
The max. density of dry WWCB ranges, in accordance with European Norm EN 13168 (formerly DIN 1101), from approx. 360 up to 570 kg/m³. Other densities may apply, subject to Client’s requirements and applications.

Product range:
The Fully Automated WWCB Plant can produce various board types, which include:

- Standard Wood Wool Cement Boards (WWCB);
- Acoustic WWCB (decorative and sound absorbing ceiling boards);
- Composite WWCB (sandwich boards with a core sheet of Polystyrene, PU-foam, Rockwool or other insulating material);
- Reinforced WWCB (roofing boards);

This WWCB Plant is standard provided with a full scope of additional “Finishing” Equipment, which consists of an Automatic Board Dryer, Thickness Calibrating Equipment and a Trimming & Profiling Saw. Optionally a Painting Line can be added to the line.

The Expandable WWCB Plant allows the production of Standard WWCB and Acoustic (fine-fibre) WWCB only. Optionally, equipment for the production of Composite WWCB or Reinforced Roofing WWCB can be added.

To reduce the initial investment, the Expandable WWCB Plant is designed for the manual (de)stacking of boards and handling of wood blocks. These operations can be fully automated at a later stage.

Plant capacities:
Table A: Plant capacity for WWCB
Fully Automated WWCB Plant and Expandable WWCB Plant, 3-shift operation.
Board dimensions of 2400 x 600 mm

<table>
<thead>
<tr>
<th>Board thickness in mm</th>
<th>m² per day (finished boards)</th>
<th>m³ per day (finished boards)</th>
<th>No. of boards per day</th>
</tr>
</thead>
<tbody>
<tr>
<td>15</td>
<td>12335</td>
<td>185</td>
<td>8565</td>
</tr>
<tr>
<td>25</td>
<td>12335</td>
<td>310</td>
<td>8565</td>
</tr>
<tr>
<td>35</td>
<td>12335</td>
<td>430</td>
<td>8565</td>
</tr>
<tr>
<td>50</td>
<td>9330</td>
<td>465</td>
<td>6480</td>
</tr>
<tr>
<td>75</td>
<td>6460</td>
<td>485</td>
<td>4485</td>
</tr>
<tr>
<td>100</td>
<td>5075</td>
<td>510</td>
<td>3525</td>
</tr>
</tbody>
</table>
Raw material consumption:
The raw material Wood for WWCB production consists of small-diameter soft wood, such as Pine, Spruce or Poplar. For example wood from forest thinnings is suitable. Cement is common OPC (Portland Cement, such as CEM I 52,5 R). In addition Water and a Salt Solution such as Sodium Silicate ("Waterglass") is used.

Raw material consumption, based on 1-shift production for boards of 2400 x 600 mm, 50 mm thickness are approx. as follows:

- **Wood wool**: 20 ton
- **Cement**: 34 ton
- **Water**: 22 m³
- **Salt solution**: 1.4 ton

Labor requirements:
The following labor requirements apply, including labor for maintenance, warehousing, cleaning, etc. Plant management is to the discretion of Client.

<table>
<thead>
<tr>
<th>Fully Automated WWCB Plant</th>
<th>Expandable WWCB Plant</th>
</tr>
</thead>
<tbody>
<tr>
<td>Number of personnel per shift:</td>
<td>18-22</td>
</tr>
</tbody>
</table>

Power consumption:
Based on a full production capacity, the total installed electrical power and electrical power consumption (incl. dust extraction, compressor, etc.) are approx.:

<table>
<thead>
<tr>
<th>Fully Automated WWCB Plant</th>
<th>Expandable WWCB Plant</th>
</tr>
</thead>
<tbody>
<tr>
<td>Installed Electrical Power:</td>
<td>approx. 1450 kVA</td>
</tr>
<tr>
<td>Electrical Power Consumption:</td>
<td>approx. 1100 kW</td>
</tr>
</tbody>
</table>

The Board Dryer in the Fully Automated WWCB Plant is gas (or steam) heated. Alternatively, the dryer may be heated by means of waste wood from the plant operation (such as the dust extraction system and bark).

Building and land requirements:
The size of the building for the Fully Automated WWCB Plant ranges from approx. 6,000 - 9,000 m² (minimum 150 m x 40 m, up to 150 x 60 m), with an overall clear height of min. 5-6 meters (partly 7 meter clearance above selective equipment).

The size of the building for an Expandable WWCB Plant is approx. 1,680 - 5,400 m² (minimum 70 m x 24 m, up to 135 x 40 m), with an overall clear height of min. 5-6 meters (partly 7 meter clearance above selective equipment).

This floor space includes for intermediate storage space for curing of the boards, as well as the board trimming operation. Additional storage space may be required for finished products, subject to local conditions.

The minimum land area required, including log yard, is approx. 3-5 HA.
**Budget Pricing:**

The budget pricing for the Eltomation Equipment for the Fully Automated WWCB Plant and Expandable WWCB Plant are as follows:

**Fully Automated WWCB Plant**
Main production line (subject to scope of supply): EUR 8.000.000,-- to EUR 9.500.000,--

**Expandable WWCB Plant**
Main production line (subject to scope of supply): EUR 4.500.000,-- to EUR 5.500.000,--

These prices include engineering, project management, an estimate for CIF/CIP shipping costs and Installation Supervision and Commissioning charges. A detailed list of the items supplied by Eltomation is provided in our detailed System Proposal, which will be provided upon request.

Local supplied items (such as fork lift trucks, cement silo's, waste/dust recovery system, etc.) are not included in the Eltomation Price. It will be possible to have additional selective parts of the plant equipment be sourced or manufactured locally per our specifications, which will reduce the above mentioned price for the equipment and shipping charges. These items could include certain conveyors, steel structures, etc. We are open for such discussion.