Hollow block, triple benefits: Resource conservation, less embodied energy and reduction in emission

Clay...
The Building Blocks of Sustainability
Wienerberger—Our Heritage

Alois Miesbach’s Vision in 1819:

“We will build the most modern brick plant in the Austrian Empire.”
Clay as a material have been used for Centuries

- It has proven its credibility in terms of time and performance
- It is a natural material with immense benefits
- It helps regulate the temperatures and moisture
- It provides natural and comfortable living for the occupants
- Clay as a material is very adaptive
Product Evolution of Clay Products

- Bigger
- Lighter
- Cooler
- Cheaper
- Environmental Friendly
- Precise
Wienerberger – From local brick producer to global player

Founded in 1819 in Vienna, Austria for producing clay bricks

**Number 1** for clay blocks worldwide

- Manufacturing in 30 countries
- 212 plants in Europe, North America and India
- ~ 14,000 employees
- Core markets: Europe, North America, Russia, India

**Our Goal**
Supplying outstanding sustainable building material solutions for a better quality of life.
Wienerberger – The Indian Journey

- State of the art manufacturing facility commissioned in Kunigal in 2009 for manufacture of Perforated /Hollow Clay Blocks – POROTHERM

- Products and Services well accepted in the market – Over 350 medium & large projects already executed

- 100% Capacity utilization achieved in the first phase

- Phased expansion underway to realize full potential

- Use of environmentally friendly manufacturing processes

- Complete recycling of Kiln hot air exhaust & use of bio mass for dryers
Wienerberger Factory: Kunigal

Wienerberger Factory: Karnataka – 80 Kms from Bengaluru Centre
Wienerberger Factory – India

- Large capacity of 100 million brick units
- Independent of Weather conditions
- Total quality control
- Highly trained personnel
- Recycling of heat in dryer - less emissions
- Large raw materials storage - 100% interruption free production
Tunnel Kiln – 145 m. long – 5.0 m width – Most efficient technology at work
Main raw material: Tank Clay / All clays sourced locally

- Transport distances (4-12 km)
- De-silting of clay tanks / non-agricultural land – Rejuvenates the water tanks
- Naturally available waste used in the blend-Granite Dust, Coal ash
- No use of toxic chemicals – 100% natural materials
POROTHERM HP: Designed for the Indian market
## POROTHERM HP – Product Parameters

<table>
<thead>
<tr>
<th>Name</th>
<th>Length</th>
<th>Width</th>
<th>Height</th>
<th>Weight</th>
<th>Density</th>
<th>Compressive Strength</th>
<th>Water Absorption</th>
<th>Efflorescence</th>
<th>U-Value</th>
<th>Sound Insulation</th>
<th>Fire Resistance</th>
</tr>
</thead>
<tbody>
<tr>
<td>POROTHERM HP 200</td>
<td>400</td>
<td>200</td>
<td>200</td>
<td>11.1</td>
<td>694</td>
<td>≥3.5 N/mm²</td>
<td>~ 15 %</td>
<td>Slight</td>
<td>1.0</td>
<td>46</td>
<td>240</td>
</tr>
<tr>
<td>POROTHERM HP 150</td>
<td>400</td>
<td>150</td>
<td>200</td>
<td>8.8</td>
<td>733</td>
<td>Same as full bricks</td>
<td>Same as full bricks</td>
<td>Same as full bricks</td>
<td>1.2</td>
<td>43</td>
<td>120</td>
</tr>
<tr>
<td>POROTHERM HP 100</td>
<td>400</td>
<td>100</td>
<td>200</td>
<td>6.3</td>
<td>788</td>
<td>Same as full bricks</td>
<td>Same as full bricks</td>
<td>Same as full bricks</td>
<td>1.7</td>
<td>40</td>
<td>90</td>
</tr>
<tr>
<td>POROTHERM HP 200H</td>
<td>200</td>
<td>200</td>
<td>200</td>
<td>5.8</td>
<td>Same as full bricks</td>
<td>Same as full bricks</td>
<td>Same as full bricks</td>
<td>Same as full bricks</td>
<td>Same as full bricks</td>
<td></td>
<td></td>
</tr>
<tr>
<td>POROTHERM HP 150H</td>
<td>200</td>
<td>150</td>
<td>200</td>
<td>4.2</td>
<td>Same as full bricks</td>
<td>Same as full bricks</td>
<td>Same as full bricks</td>
<td>Same as full bricks</td>
<td>Same as full bricks</td>
<td></td>
<td></td>
</tr>
<tr>
<td>POROTHERM HP 100H</td>
<td>200</td>
<td>100</td>
<td>200</td>
<td>3.1</td>
<td>Same as full bricks</td>
<td>Same as full bricks</td>
<td>Same as full bricks</td>
<td>Same as full bricks</td>
<td>Same as full bricks</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

## POROTHERM HP - Tolerance

<table>
<thead>
<tr>
<th>Dimensions (mm)</th>
<th>400</th>
<th>200</th>
<th>150</th>
<th>100</th>
</tr>
</thead>
<tbody>
<tr>
<td>Tolerance in (mm)</td>
<td>± 8</td>
<td>± 4</td>
<td>± 3</td>
<td>± 2</td>
</tr>
</tbody>
</table>

Note:
Compressive Strength value is based on testing procedure as prescribed in IS 3952.
POROTHERM is manufactured using Natural Raw Materials, hence there could be variations in colour.
Porotherm HP – Contribution towards Sustainability

- **Void Ratio 50% + for all formats**
  - Reduced Clay demand
  - Low in Energy Consumption – Process oriented
- Light weight by 60%
- Saves in steel and concrete by 10 to 15%
- Saves labor
- Savings in sand consumption – uniform brick surface
- Savings up to 10% by reducing of the plaster thickness
- Thin masonry joints possible – restricted up to 10 - 12 mm
Porotherm HP – Contribution towards Sustainability

- Excellent thermal insulation – Lower ‘U’ Values
  - Reduction in energy consumption – comfortable indoors
  - Less demand on artificial cooling OR heating
- Faster construction and ease of handling at site
- Ease of Application
- Low on wastages – generates less debris
Porotherm HP – Lowest on Resource Consumption

- POROTHERM Clay Bricks are lowest on resource consumption – Renewable & Non Renewable Energy
- Thus making the bricks Truly Green

<table>
<thead>
<tr>
<th>Walling Materials</th>
<th>Renewable Energy</th>
<th>Non-Renewable Energy</th>
<th>Green House Effect 100a</th>
<th>Acidification Potential</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>MJ</td>
<td>MJ</td>
<td>Kg CO2 equiv.</td>
<td>Kg Sox equiv.</td>
</tr>
<tr>
<td>POROTHERM</td>
<td>0.35</td>
<td>21.42</td>
<td>5.72</td>
<td>6.113</td>
</tr>
<tr>
<td>Clay Bricks (Solid)</td>
<td>0.94</td>
<td>57.15</td>
<td>15.26</td>
<td>16.306</td>
</tr>
<tr>
<td>Conc. Blocks</td>
<td>1.02</td>
<td>61.76</td>
<td>17.01</td>
<td>18.173</td>
</tr>
<tr>
<td>AAC Blocks</td>
<td>0.51</td>
<td>30.88</td>
<td>8.25</td>
<td>8.811</td>
</tr>
</tbody>
</table>

Source – www.ziegel.at
IGBC Listing for Porotherm HP

- The rating system developed based on guidelines of USGBC and promoted by CII – Confederation Of Indian Industries

- POROTHERM HP Clay bricks are rated under following criteria’s
  - **Energy Efficiency**: Lower ‘U’ values assure better thermal insulation thus providing comfortable indoor climate – reduce energy demand for air conditioning
    - ‘U’ Value: 1.0 W/m²K
  - **Material with Recycled Content**: Raw Material used are industrial waste or recycled materials – thus save on natural resources Eg. coal ash, rice husk, granite slurry etc.
  - **Regional Material**: Locally sourced and locally consumed

- In addition we use De- silted Clay from dead water tanks
## Porotherm HP – GRIHA Rating

<table>
<thead>
<tr>
<th>Product Name</th>
<th>Inclusion in following Criteria’s</th>
</tr>
</thead>
<tbody>
<tr>
<td>POROTHERM HP 100</td>
<td>15 &amp; 16. SVAGRIHA Criteria 11</td>
</tr>
<tr>
<td>POROTHERM HP 150</td>
<td>15, 16 &amp; 29. SVAGRIHA Criteria 11</td>
</tr>
<tr>
<td>POROTHERM HP 200</td>
<td>15, 16 &amp; 29. SVAGRIHA Criteria 11</td>
</tr>
<tr>
<td>POROTHERM THERMOBRICK HP 150</td>
<td>14, 15, 16 &amp; 29. SVAGRIHA Criteria 5 &amp; 11</td>
</tr>
<tr>
<td>POROTHERM THERMOBRICK HP 200</td>
<td>14, 15, 16 &amp; 29. SVAGRIHA Criteria 5 &amp; 11</td>
</tr>
</tbody>
</table>

### POROTHERM & Thermobrick Inclusion in following Criteria’s

<table>
<thead>
<tr>
<th>Criteria</th>
<th>Criteria Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>Criteria 14</td>
<td>Optimize energy performance of building within specified comfort limits</td>
</tr>
<tr>
<td>Criteria 15</td>
<td>Utilization of fly-ash or equivalent industrial/agricultural waste as recommended by BIS in building structures</td>
</tr>
<tr>
<td>Criteria 16</td>
<td>Reduce embodied energy of construction is reduced by adopting material efficient technologies and/or low energy materials</td>
</tr>
<tr>
<td>Criteria 29</td>
<td>Acceptable outdoor and indoor noise levels</td>
</tr>
</tbody>
</table>

### Svagriha

<table>
<thead>
<tr>
<th>Criteria</th>
<th>Criteria Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>Criteria 5</td>
<td>Thermal Efficiency of Building Envelop</td>
</tr>
<tr>
<td>Criteria 11</td>
<td>Reduce embodied energy of building</td>
</tr>
</tbody>
</table>
Porotherm HP – Clients (Advantage Raheja)

Builder Name: Advantage Raheja
Project Name: Pebble Bay
Type: Residential Apartment
Wall Area: 700,000 Sft
Contractor: Gammon India Limited
Architect: Vijay Raheja
Structural Const: Prasad Consultants
Location: Bangalore
Porotherm HP – Clients (Nitesh Estates)

Builder Name: Nitesh Estates Limited
Project Name: Caesars Palace & Columbus Square
Type: Residential Apartment
Wall Area: 20,000,00 Sft
Contractor: NCCCL & AICL
Architect: DFA Architects & DKA Architects
Structural Const: Design Tree & Design Ventures.
Location: Bangalore
Porotherm HP – Clients (Sattva Group)

Builder Name: Sattva Group
Project Name: Magnificia, Senorita, Greenage, Luxuria
Type: Residential Apartment
Wall Area: 32,000,00 Sft
Contractor: Simplex Infra, Gammon, BE Billimorea
Architect: Thomas Associates, Zachariah Consultants..
Structural Const: Sterling Consultants.
Location: Bangalore
Pre Certified Gold Rated Green Building

Builder Name: Godrej Properties Limited
Project Name: Platinum
Type: Residential Apartment
Wall Area: 8,00,000 Sft
Contractor: Gammon India Limited
Architect: RSP Architects.
Structural Const: Sterling Consultants.
Location: Bangalore
<table>
<thead>
<tr>
<th>Builder Name:</th>
<th>Total Environment Building Systems Pvt Ltd</th>
</tr>
</thead>
<tbody>
<tr>
<td>Project Name:</td>
<td>WOYM, TMFT, VGG</td>
</tr>
<tr>
<td>Type:</td>
<td>Residential Apartment</td>
</tr>
<tr>
<td>Wall Area:</td>
<td>12,00,000 Sft</td>
</tr>
<tr>
<td>Contractor:</td>
<td>Inhouse.</td>
</tr>
<tr>
<td>Architect:</td>
<td>Inhouse.</td>
</tr>
<tr>
<td>Structural Const:</td>
<td>Inhouse.</td>
</tr>
<tr>
<td>Location:</td>
<td>Bangalore</td>
</tr>
</tbody>
</table>
Customer Name: Crown Home Engineers
Project Name: Crown Aura
Type: Residential Apartment
Contractor: In house
Str. Consultnats: Prasad Consultants.
Location: Bangalore
Wall Area: 200,000 Sft
Porotherm HP – Clients (Sowparnika Pvt Ltd.)

**Builder Name:** Sowparnika Projects  
**Project Name:** Sai Krishna Apartment  
**Type:** Residential Apartment  
**Wall Area:** 180,000 Sft  
**Contractor:** In house  
**Architect:** SDeG Architecture  
**Structural Engg:** Eco Consultants  
**Location:** Bangalore
### Porotherm HP – Clients (Legacy Group)

<table>
<thead>
<tr>
<th>Builder Name:</th>
<th>Legacy Group</th>
</tr>
</thead>
<tbody>
<tr>
<td>Project Name:</td>
<td>Legacy Dimora</td>
</tr>
<tr>
<td>Type:</td>
<td>Villa style apartments</td>
</tr>
<tr>
<td>Wall Area:</td>
<td>150,000 Sft</td>
</tr>
<tr>
<td>Structural Consult:</td>
<td>Eco Consultants</td>
</tr>
<tr>
<td>Architect:</td>
<td>DFA Architects</td>
</tr>
<tr>
<td>Location:</td>
<td>Bangalore</td>
</tr>
</tbody>
</table>
Porotherm HP – Clients (Ramanyam, Chennai)

Builder Name: Ramanyam
Project Name: Aurovil
Type: Residential Apartments
Wall Area: 170,000 Sft
Contractor: In house
Architect: In house
Location: Chennai
Porotherm VP T&G – Product Parameter

### POROTHERM VP T&G - Product Parameters

<table>
<thead>
<tr>
<th>Name</th>
<th>Length</th>
<th>Width</th>
<th>Height</th>
<th>Weight</th>
<th>Density</th>
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<th>Efflorescence</th>
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<th>Sound Insulation</th>
<th>Fire Resistance</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>MM</td>
<td>MM</td>
<td>MM</td>
<td>Kg.</td>
<td>Kg/m³</td>
<td>N/mm²</td>
<td>%</td>
<td></td>
<td>W/m²K</td>
<td>Rw (db)</td>
<td>min</td>
</tr>
<tr>
<td>POROTHERM VP 200P T&amp;G</td>
<td>400</td>
<td>200</td>
<td>200</td>
<td>12.8</td>
<td>800</td>
<td>≥ 7</td>
<td>≤ 20%</td>
<td>Slight</td>
<td>1.0</td>
<td>48</td>
<td>240</td>
</tr>
<tr>
<td>POROTHERM VP 150P T&amp;G</td>
<td>400</td>
<td>150</td>
<td>200</td>
<td>9.8</td>
<td>817</td>
<td></td>
<td></td>
<td></td>
<td>1.2</td>
<td>47</td>
<td>120</td>
</tr>
<tr>
<td>POROTHERM VP 100P T&amp;G</td>
<td>400</td>
<td>100</td>
<td>200</td>
<td>7.5</td>
<td>938</td>
<td></td>
<td></td>
<td></td>
<td>1.7</td>
<td>45</td>
<td>90</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>POROTHERM VP T&amp;G - Tolerance</th>
</tr>
</thead>
<tbody>
<tr>
<td>Dimensions (mm)</td>
</tr>
<tr>
<td>Tolerance in (mm)</td>
</tr>
</tbody>
</table>

On height of the bricks - Wienerberger provides a precision of ± 1mm

**Note:**
POROTHERM is manufactured using Natural Raw Materials, hence there could be variations in colour.
Porotherm VP T&G – Interlock

Interlock on Vertical Joints – POROTHERM VP T&G Smart Brick
Porotherm VP T&G – Product Parameter / Product benefit

- Extremely fast construction – potentially **doubles** the output at site
- Minimizes the construction time - **faster project** delivery
- Saves on **Natural Resources** – Sand, Cement (Mortar) & Water by **almost 90%**
- Clean Construction site – **no residue no debris at site**
- **Mason friendly** – high tech system
- High thermal insulation – **no thermal bridges**
  – comfortable living
- Interlock design: Ensures **stronger bond** between the bricks and hence a **stronger wall**
Thank you for your time...
Visit us at our showroom on 88/4, Richmond Road, Bengaluru

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https://www.facebook.com/wienerberger.in
http://www.linkedin.com/company/wienerberger-india-private-limited