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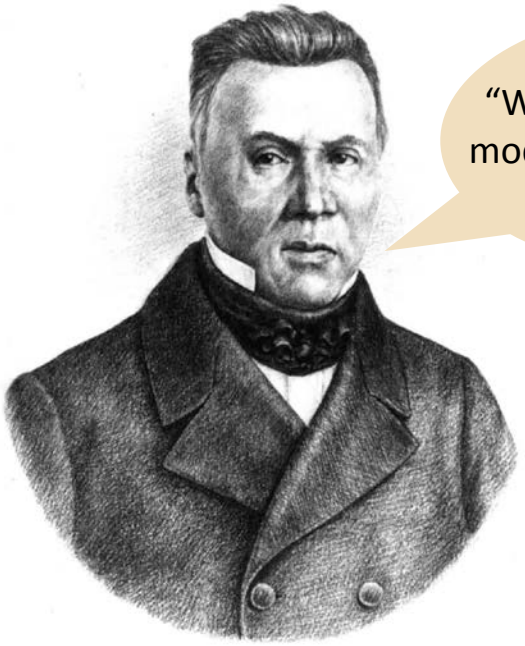
# Hollow block, triple benefits: Resource conservation, less embodied energy and Reduction in emission

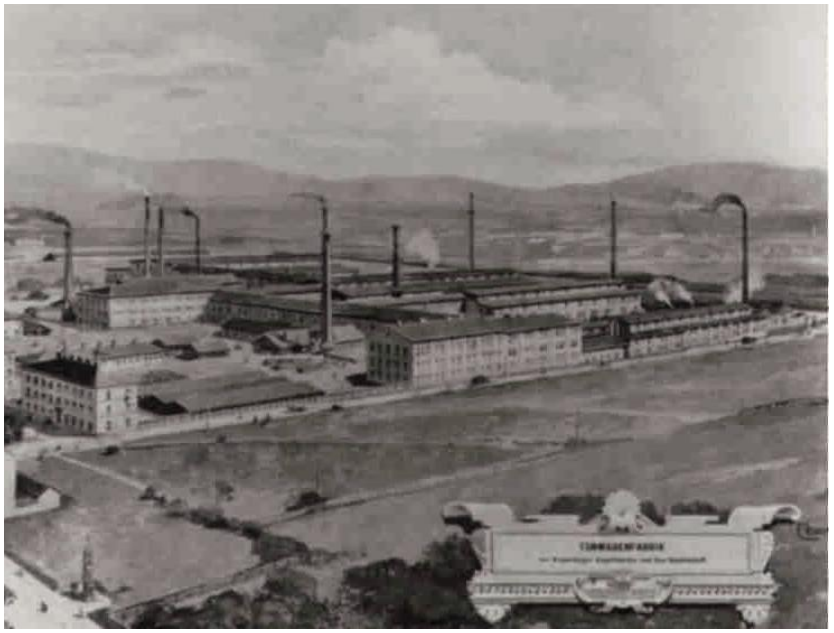
## Clay...
## The Building Blocks of Sustainability

# Wienerberger– Our Heritage

Alois Miesbach‘s Vision in 1819:



“We will build the most modern brick plant in the Austrian Empire.“



# Wienerberger – Clay Heritage

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## 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

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- 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

# Wienerberger : Kiln

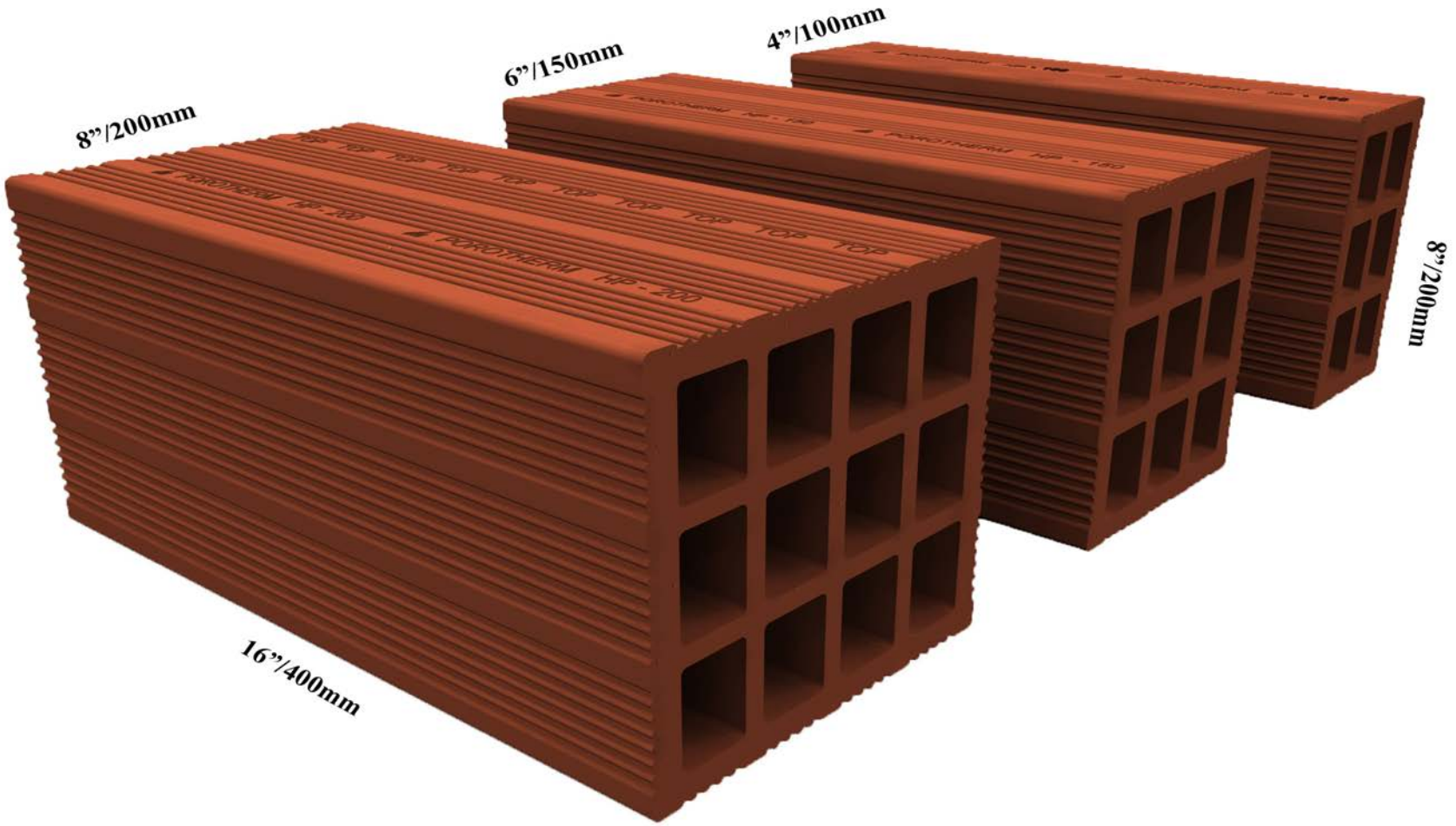
***Tunnel Kiln – 145 m. long – 5.0 m width – Most efficient technology at work***

# Sensible use of raw materials


**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

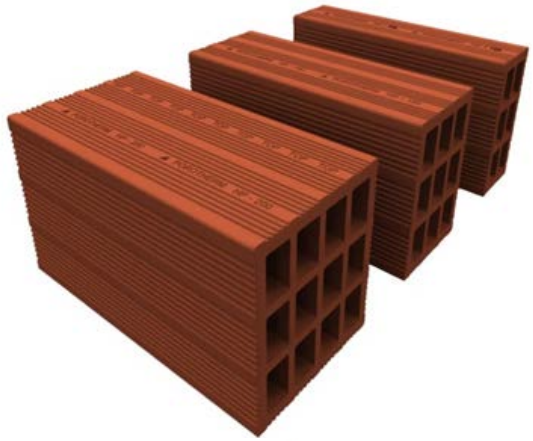
# POROTHERM HP : Designed for the Indian market



# POROTHERM HP – Product Parameters

| POROTHERM HP - Product Paramters | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| Name | Length | Width | Height | Weight | Density | Compressive Strength | Water Absorption | Efflorescence | U-Value | Sound Insulation | Fire Resistance |
| | MM | MM | MM | Kg. | $Kg/m^3$ | $N/mm^2$ | % | | $W/m^2K$ | Rw (db) | min |
| POROTHERM HP 200 | 400 | 200 | 200 | 11.1 | 694 | ≥3.5 | ~ 15 | Slight | 1.0 | 46 | 240 |
| POROTHERM HP 150 | 400 | 150 | 200 | 8.8 | 733 | | | | 1.2 | 43 | 120 |
| POROTHERM HP 100 | 400 | 100 | 200 | 6.3 | 788 | | | | 1.7 | 40 | 90 |
| POROTHERM HP 200H | 200 | 200 | 200 | 5.8 | Same as full bricks | Same as full bricks | Same as full bricks | Same as full bricks | Same as full bricks | Same as full bricks | Same as full bricks |
| POROTHERM HP 150H | 200 | 150 | 200 | 4.2 | | | | | | | |
| POROTHERM HP 100H | 200 | 100 | 200 | 3.1 | | | | | | | |

| POROTHERM HP - Tolerance | | | | |
|---|---|---|---|---|
| Dimensions (mm) | 400 | 200 | 150 | 100 |
| Tolerance in (mm) | ± 8 | ± 4 | ± 3 | ± 2 |



**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

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

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

Source – www.ziegel.at

# IGBC Listing for Porotherm HP

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- 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

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| Product Name | Inclusion in following Criteria's |
|---|---|
| POROTHERM HP 100 | 15 & 16. SVAGRIHA Criteria 11 |
| POROTHERM HP 150 | 15, 16 & 29. SVAGRIHA Criteria 11 |
| POROTHERM HP 200 | 15,16 & 29. SVAGRIHA Criteria 11 |
| POROTHERM THERMOBRICK HP 150 | 14,15,16 & 29. SVAGRIHA Criteria 5 & 11 |
| POROTHERM THERMOBRICK HP 200 | 14,15, 16 & 29. SVAGRIHA Criteria 5 & 11 |

| POROTHERM & Thermobrick Inclusion in following Criteria's | |
|---|---|
| **Criteria** | **Criteria Description** |
| Criteria 14 | Optimize energy performance of building within specified comfort limits |
| Criteria 15 | Utilization of fly-ash or equivalent industrial/agricultural waste as recommended by BIS in building structures |
| Criteria 16 | Reduce embodied energy of construction is reduced by adopting material efficient technologies and/or low energy materials |
| Criteria 29 | Acceptable outdoor and indoor noise levels |
| **Svagriha** | |
| **Criteria** | **Criteria Description** |
| Criteria 5 | Thermal Efficiency of Building Envelop |
| Criteria 11 | Reduce embodied energy of building |

# Porotherm HP – Clients (Indian School of Business)

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| | |
|---|---|
| **Project Name:** | **Indian School of Business** |
| **Type:** | **Institutional building** |
| **Contractor:** | **JayPee Contractors** |
| **Architect:** | **Inform Architects** |
| **Location:** | **Hyderabad** |
| **Area:** | **100,000+ Sft** |

**Gold Rated Green Building**

# Porotherm HP – Clients (Advantage Raheja)

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| | |
|---|---|
| **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)

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| | |
|---|---|
| **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** |

# Porotherm HP – Clients (Godrej Properties Limited)

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**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** |

# Porotherm HP – Clients (Total Environment)


| | |
|---|---|
| **Builder Name:** | **Total Environment Building Systems Pvt Ltd** |
| **Project Name:** | **WOYM, TMFT, VGG** |
| **Type:** | **Residential Apartment** |
| **Wall Area:** | **12,00,000 Sft** |
| **Contractor:** | **Inhouse.** |
| **Architect:** | **Inhouse.** |
| **Structural Const:** | **Inhouse.** |
| **Location:** | **Bangalore** |

# Porotherm HP – Clients (Crown Home Engineers)

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| | |
|---|---|
| **Customer Name:** | **Crown Home Engineers** |
| **Project Name:** | **Crown Aura** |
| **Type:** | **Residential Apartment** |
| **Contractor:** | **In house** |
| **Architect:** | **Thomas Associates.** |
| **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)

| | |
|---|---|
| **Builder Name:** | **Legacy Group** |
| **Project Name:** | **Legacy Dimora** |
| **Type:** | **Villa style apartments** |
| **Wall Area:** | **150,000 Sft** |
| **Structural Consult:** | **Eco Consultants** |
| **Architect:** | **DFA Architects** |
| **Location:** | **Bangalore** |

# 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 – Innovative Product Offering

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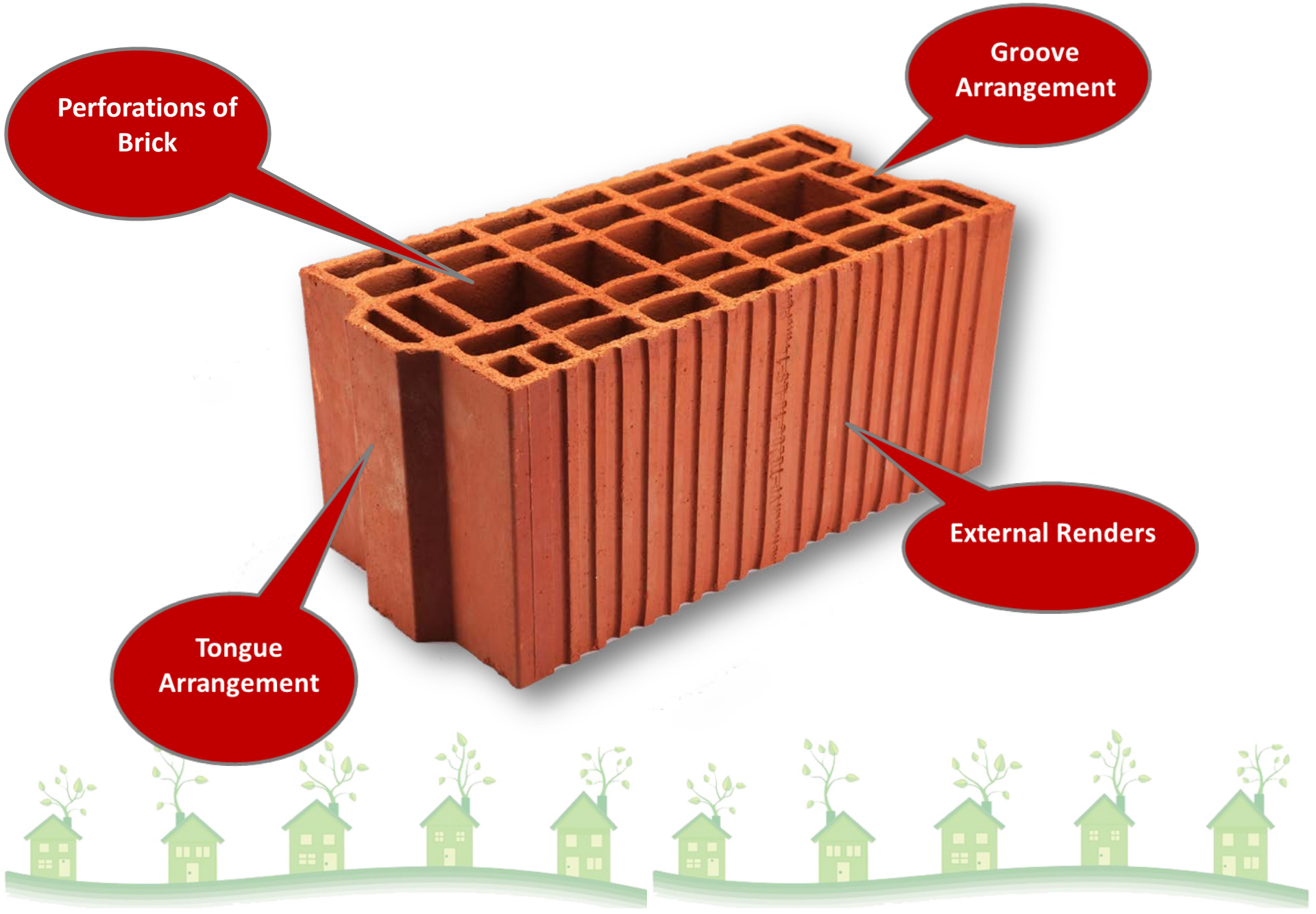

# Porotherm VP T&G – Product Parameter

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| POROTHERM VP T&G - Product Parameters | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| Name | Length | Width | Height | Weight | Density | Compressive Strength | Water Absorption | Efflorescence | U-Value | Sound Insulation | Fire Resistance |
| | MM | MM | MM | Kg. | $Kg/m^3$ | $N/mm^2$ | % | | $W/m^2K$ | Rw (db) | min |
| POROTHERM VP 200P T&G | 400 | 200 | 200 | 12.8 | 800 | ≥ 7 | ≤ 20% | Slight | 1.0 | 48 | 240 |
| POROTHERM VP 150P T&G | 400 | 150 | 200 | 9.8 | 817 | | | | 1.2 | 47 | 120 |
| POROTHERM VP 100P T&G | 400 | 100 | 200 | 7.5 | 938 | | | | 1.7 | 45 | 90 |

| POROTHERM VP T&G - Tolerance | | | | |
|---|---|---|---|---|
| **Dimensions (mm)** | **400** | **200** | **150** | **100** |
| Tolerance in (mm) | ± 8 | ± 4 | ± 3 | ± 2 |
| 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

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- 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**

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