

POROTHERM System

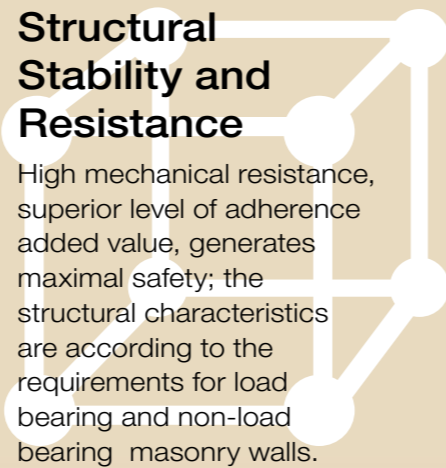
**Products
Presentation**



Complete solution for a perfect house!

Structural Stability and Resistance

High mechanical resistance, superior level of adherence added value, generates maximal safety; the structural characteristics are according to the requirements for load bearing and non-load bearing masonry walls.



Fire Protection

The bricks fall in the performance class regarding the reaction to fire A1.



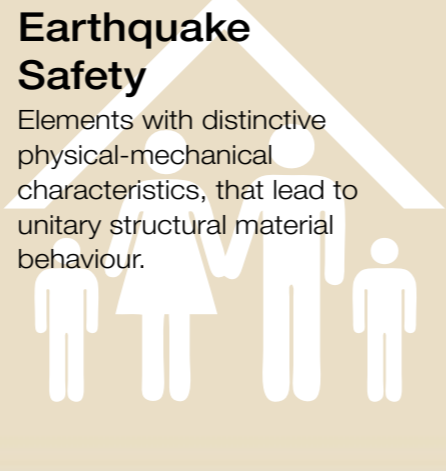
Ecological Products

100% the recipe containing clay, sawdust, sand. The bricks are made of the four basic natural elements: earth, water, air, fire.



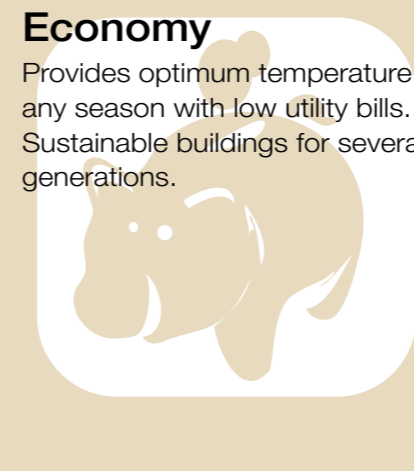
Earthquake Safety

Elements with distinctive physical-mechanical characteristics, that lead to unitary structural material behaviour.



Economy

Provides optimum temperature in any season with low utility bills. Sustainable buildings for several generations.



Economy

The house built with POROTHERM System ensures an optimum temperature in any season, with low utility bills. The durability and quality of the products guarantee the long term value of the building.



Ecology

The bricks represent the basic element of a house. The source of the bricks is the natural environment, the main component being the clay. If you decide to demolish a construction, the bricks are not polluting, they are becoming part of the nature, or they could be re-used for other constructions. Also, the closed circuit within the Wienerberger factories does not allow removal of pollutants in the atmosphere. The bricks are made of the four basic natural elements: clay, water, air and fire.

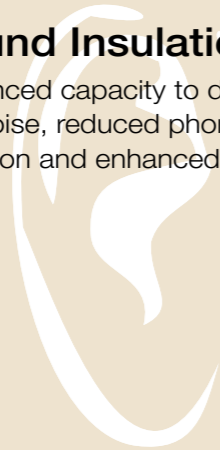
Outstanding Thermal Insulating Properties

Low thermo-conductivity, high thermo-resistance.



Sound Insulation

Enhanced capacity to diminish the noise, reduced phonic pollution and enhanced comfort.



Value Retention

Long life (houses for several generations); added value by maintaining a high range on the real estate market.



Comfort

Remarkable interior climate, regardless of season.



Energy

Wienerberger invested value so that your home stays energy-efficient throughout its life-time and so that you could always enjoy and feel good at home.



Emotion

90% of the time we spend indoors, mostly in our own home. A brick house offers you a pleasant environment, comfortable and healthy for you and your family. For areas with high seismic activity, Wienerberger has created, through research and high technology, special products that provide earthquake-resistant masonry.

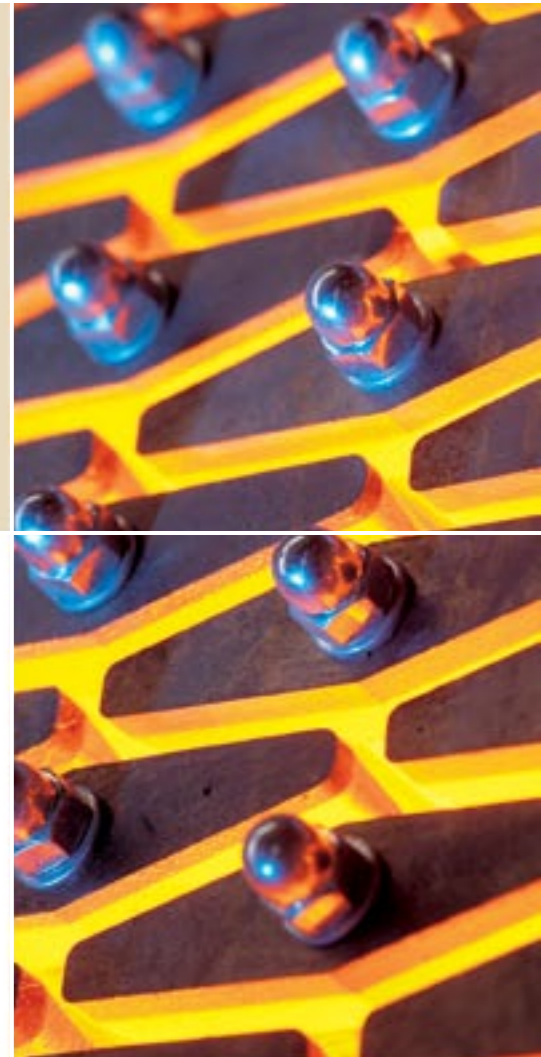


Wienerberger Sisteme de Căramizi is preoccupied to meet the needs of safety, energy efficiency and comfort of the clients. The effort of Wienerberger specialists in research materialised in two new products, **Porotherm 30 STh** and **Porotherm 38 STh**, with innovative design of structure and disposal of vertical hollows.

Section at the level of S (seismic) carving

Physical Properties	POROTHERM 38 STh	POROTHERM 30 STh
Compressive strength on the laying face (average declared value) $f_{b,med}$ (N/mm ²)	10	10
Thermal conductivity* $\lambda_{10,dry}$ (W/mK)	0,141	0,141
Wall thermal resistance R (m ² K/W) (un-plastered, mortar masonry M5)	2,37	1,90
Parameter of sound reduction R_W (dB)	50	50
Fire behaviour (class)	A1	A1

* according to SR EN 1745:2003
 $f_{b,med}$ - minim value guaranteed, according SR EN 771-1:2003 SR EN 771-1:2003/A1:2005;
 $\lambda_{10,dry}$ - thermal conductivity, declared value, for fired ceramic block, in completely dried state.



POROTHERM STh
 Ceramic Blocks
 + 30% performance on seismic demands
 The best thermal performance



POROTHERM 38 STh



POROTHERM 30 STh

POROTHERM S
 Ceramic Blocks
 +20% performance on seismic demands



POROTHERM 25 S

POROTHERM STh
 Domain of Use

Walls, columns, inner walls, structural plastered masonry walls. The ceramic block configuration improves the yielding mechanism under the seismic action (main efforts - diagonal). The shearing resistance in vertical mortar joint is enhanced with about 30% toward the mortar pocket type products. (ctr. 5253 / INCERC 59 / ZIP/ 02.07.2008)
 The thermal conductivity offers the best thermal performance ($\lambda_{10,dry} = 0.141$ W/mK)

General Characteristics	POROTHERM 38 STh	POROTHERM 30 STh
Dimensions (mm) (l x b x h)	250 x 380 x 238	250 x 300 x 238
Weight (kg/pcs.)	about 19	about 15
Gross density (kg/m ³)	about 800	about 800

Specific Consumptions, Volume Equivalents, Delivery Conditions	POROTHERM 38 STh	POROTHERM 30 STh
Needed quantity of bricks (pcs/m ³ masonry) (pcs/m ² masonry)	43/16	54/16
Mortar consumption (M5) (l/m ³ masonry)	169	168
Labour consumption (hours/m ³ masonry)	3,15	3,20
Equivalent volume in traditional bricks (240 x 115 x 88)(pcs.)	9,3	7,35
Delivery (pcs./packed pallet)	60	80

POROTHERM 25 S
 Domain of Use

Walls, columns, inner walls, structural plastered masonry walls. The ceramic block configuration improves the yielding mechanism under the seismic action (main efforts - diagonal). The shearing resistance in vertical mortar joint is enhanced with about 20% toward the mortar pocket type products. (Report no. 669/2005 Procema Cercetare s.r.l.)

General Characteristics	POROTHERM 25 S
Dimensions (mm) (l x b x h)	375 x 250 x 238
Weight (kg/pcs.)	about 16
Gross density (kg/m ³)	about 800

Specific Consumptions, Volume Equivalents, Delivery Conditions	POROTHERM 25 S
Needed quantity of bricks (pcs/m ³ masonry) (pcs/m ² masonry)	44/11
Mortar consumption (M5) (l/m ³ masonry)	147
Labour consumption (hours/m ³ masonry)	3,10
Equivalent volume in traditional bricks (240 x 115 x 88)(pcs.)	9,18
Delivery (pcs./packed pallet)	60

Physical Properties	POROTHERM 25 S
Compressive strength on the laying face (average declared value) $f_{b,med}$ (N/mm ²)	10
Thermal conductivity* $\lambda_{10,dry}$ (W/mK)	0,190
Wall thermal resistance R (m ² K/W) (un-plastered, mortar masonry M5)	1,31
Parameter of sound reduction R_W (dB)	51
Fire behaviour (class)	A1

* according to SR EN 1745:2003
 $f_{b,med}$ - minim value guaranteed, according SR EN 771-1:2003 SR EN 771-1:2003/A1:2005;
 $\lambda_{10,dry}$ - thermal conductivity, declared value, for fired ceramic block, in completely dried state.

POROTHERM Ceramic Blocks with Mortar Pocket Domain of Use

Walls, columns, inner partition walls, structural masonry walls, in plastered masonry. Products also available in half blocks as additional masonry element.

Physical Properties	POROTHERM 38	POROTHERM 30	POROTHERM 25
Compressive strength on the laying face (average declared value) (N/mm ²) $f_{b,med}$	10	10	10
Thermal conductivity* $\lambda_{10,dry}$ (W/mK)	0,159	0,189	0,190
Wall thermal resistance R (m ² K/W) (un-plastered, mortar masonry M5)	2,17	1,54	1,31
Parameter of sound reduction R_W (dB)	50	50	51
Fire behaviour (class)	A1	A1	A1

* according to SR EN 1745:2003
 $f_{b,med}$ - minimum value guaranteed, according SR EN 771-1:2003 SR EN 771-1:2003/A1:2005; $\lambda_{10,dry}$ - thermal conductivity, declared value, for fired ceramic block, in completely dried state; R - thermal transfer resistance of masonry made of POROTHERM ceramic blocks in conditions for construction specified by the producer.



Physical Properties	POROTHERM 38 1/2	POROTHERM 30 1/2
Compressive strength on the laying face (average declared value) $f_{b,med}$ (N/mm ²)	10	10
Thermal conductivity* $\lambda_{10,dry}$ (W/mK)	0,170	0,190
Wall thermal resistance R (m ² K/W) (un-plastered, mortar masonry M5)	2,06	1,54
Fire behaviour (class)	A1	A1

* according to SR EN 1745:2003
 $f_{b,med}$ - minimum value guaranteed, according SR EN 771-1:2003 SR EN 771-1:2003/A1:2005; $\lambda_{10,dry}$ - thermal conductivity, declared value, for fired ceramic block, in completely dried state; R - thermal transfer resistance of masonry made of POROTHERM ceramic blocks in conditions for construction specified by the producer.

POROTHERM Ceramic Blocks with Mortar Pocket



POROTHERM 38



POROTHERM 30



POROTHERM 25



POROTHERM 38 1/2



POROTHERM 30 1/2



General Characteristics	POROTHERM 38	POROTHERM 30	POROTHERM 25
Dimensions (mm) (l x b x h)	250 x 380 x 238	250 x 300 x 238	375 x 250 x 238
Weight (kg/pcs.)	about 19	about 15	about 19
Gross density (kg/m ³)	about 800	about 800	about 800

Specific Consumptions, Volume Equivalents, Delivery Conditions	POROTHERM 38	POROTHERM 30	POROTHERM 25
Needed quantity of bricks (pcs/m ³ masonry) (pcs/m ² masonry)	43/16	54/16	44/11
Mortar consumption (M5) (l/m ³ masonry)	131	133	115
Labour consumption (hours/m ³ masonry)	3,20	3,35	3,15
Equivalent volume in traditional bricks (240 x 115 x 88) (pcs.)	9,3	7,35	9,18
Delivery (pcs./packed pallet)	60	80	60



General Characteristics	POROTHERM 38 1/2	POROTHERM 30 1/2
Dimensions (mm) (l x b x h)	120 x 380 x 238	120 x 300 x 238
Weight (kg/pcs.)	about 9,5	about 7,5
Gross density (kg/m ³)	about 900	about 900

Specific Consumptions, Volume Equivalents, Delivery Conditions	POROTHERM 38 1/2	POROTHERM 30 1/2
Needed quantity of bricks (pcs/m ³ masonry) (pcs/m ² masonry)	as designed	as designed
Mortar consumption (M5) (l/m ³ masonry)	131	133
Labour consumption (hours/m ³ masonry)	3,20	3,35
Equivalent volume in traditional bricks (240 x 115 x 88) (pcs.)	4,55	3,68
Delivery (pcs./packed pallet)	120	160

POROTHERM Tong & Groove (N+F) Domain of Use

Non-structural elements and partition walls, in plastered masonry.

Physical Properties	POROTHERM 20 N+F	POROTHERM 11,5 N+F
Compressive strength on the laying face (average declared value) $f_{b,med}$ (N/mm ²)	10	5
Thermal conductivity* $\lambda_{10,dry}$ (W/mK)	0,33	0,33
Parameter of sound reduction R_W (dB)	40	41
Fire behaviour (class)	A1	A1

* according to SR EN 1745:2003
 $f_{b,med}$ - minim value guaranteed, according SR EN 771-1:2003 SR EN 771-1-2003/A1:2005; $\lambda_{10,dry}$ - thermal conductivity, declared value, for fired ceramic block, in completely dried state.

Advantages of ceramic blocks POROTHERM 25/30 Light

- An average of 28% lower weight/masonry element, comparing to other ceramic blocks with similar dimensions;
- Superior compressive strength, 10 N/mm² (comparing to minimum 5 N/mm² legal design codes requirement for masonry elements in inner partition walls and reinforced concrete frames infill masonry);
- Improved heat storage capacity with 30% higher than other construction materials;
- Reduced time for masonry drying;
- Durability;
- Easy to wall up thanks to the manipulation hollows, regardless of the masonry thickness;
- 100% natural product;
- The reduced contents of humidity and good permeability of water vapours are qualities of ceramic masonry that guarantee a healthy and ventilated environment, without dampness or mildew.

POROTHERM Ceramic Blocks with Tong & Groove (N+F)



POROTHERM 20 N+F



POROTHERM 11,5 N+F

POROTHERM Ceramic Blocks 25/30 Light



POROTHERM 25/30 Light

Physical Properties	POROTHERM 25/30 Light
Compressive strength on the laying face (average declared value) $f_{b,med}$ (N/mm ²)	10
Thermal conductivity* $\lambda_{10,dry}$ (W/mK)	0,315/0,235
Parameter of sound reduction R_W (dB)	50/48
W _a thermal resistance R (m ² K/W) (un-plastered, mortar masonry M5)	0,91/1,31
Fire behaviour (class)	A1

* according to SR EN 1745:2003
 $f_{b,med}$ - minim value guaranteed, according SR EN 771-1:2003 SR EN 771-1-2003/A1:2005; $\lambda_{10,dry}$ - thermal conductivity, declared value, for fired ceramic block, in completely dried state.

General Characteristics	POROTHERM 20 N+F	POROTHERM 11,5 N+F
Dimensions (mm) (l x b x h)	500 x 200 x 238	500 x 115 x 238
Weight (kg/pcs.)	about 18	about 11
Gross density (kg/m ³)	about 750	about 750

Specific Consumptions, Volume Equivalents, Delivery Conditions	POROTHERM 20 N+F	POROTHERM 11,5 N+F
Needed quantity of bricks (pcs/m ³ masonry) (pcs/m ² masonry)	40/8	70/8
Mortar consumption (M5) (l/m ³ masonry)	63	63
Labour consumption (hours/m ³ masonry)	3,30	3,50
Delivery (pcs./packed pallet)	48	96/90*

* According to the factory packing system.

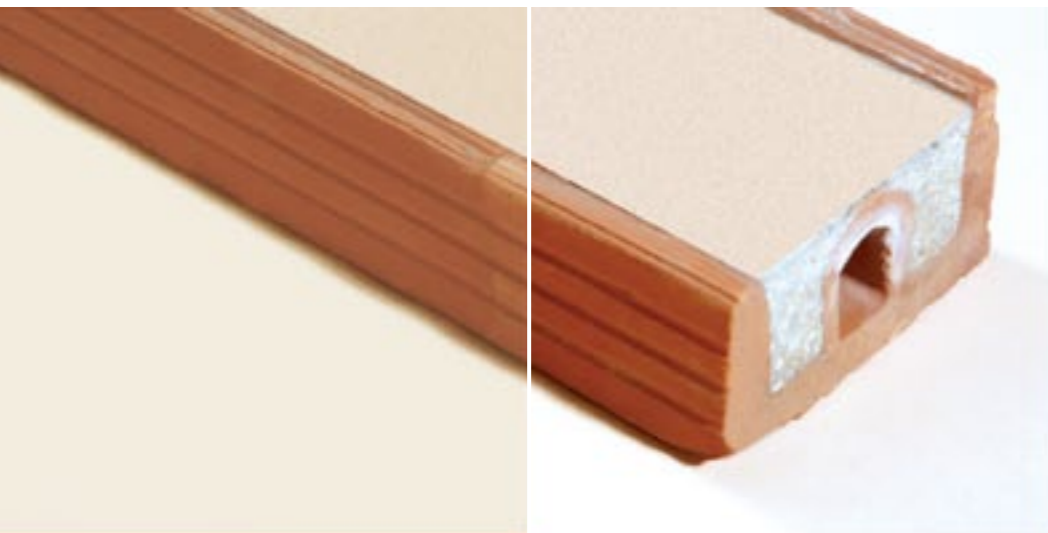
POROTHERM 25/30 Light Domain of Use

Non-structural elements and partition walls, in plastered masonry with thickness of 25 or 30 cm.

General Characteristics	POROTHERM 25/30 Light	
Dimensions (mm) (l x b x h)	250 x 300 x 238	
Weight (kg/pcs.)	about 11,5	
Gross density (kg/m ³)	about 650	

Specific Consumptions, Volume Equivalents, Delivery Conditions	POROTHERM 25/30 Light	
	25 cm masonry	30 cm masonry
Needed quantity of bricks (pcs/m ³ masonry) (pcs/m ² masonry)	53/14	53/16
Mortar consumption (M5) (l/m ³ masonry)	92	97
Labour consumption (hours/m ³ masonry)	3,2	
Delivery (pcs./packed pallet)	80	





POROTHERM Lintels

Domain of Use

Construction elements in the superior part of the openings in masonry designed for doors and windows, with supporting role for the upper part of them, consisting in masonry or reinforced concrete.

Constructive System

- Lintels are produced with steel strands and a high grade concrete in the longitudinal grooves, in this way inducing pre-compression in the elements.
- The construction elements are designed and produced considering the different fillings, according to the opening of the hollows where they will be assembled.
- The **POROTHERM** pre-compressed Lintels, filled-up in lost ceramic shells, are part of the constructive **POROTHERM System** and could be successfully used in other constructive systems.

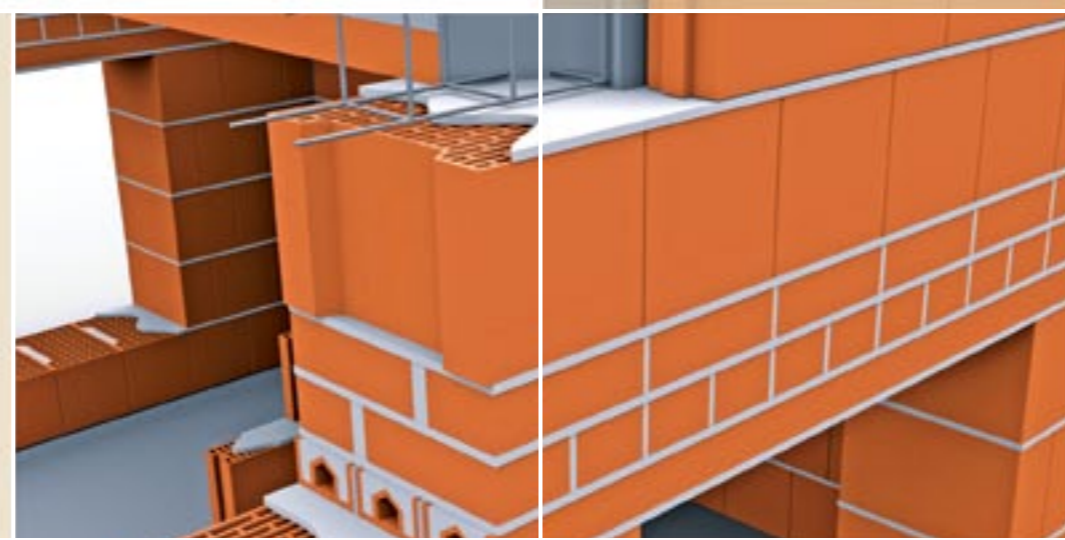


POROTHERM Lintels (Girders) in Ceramic Shell



Construction way of POROTHERM lintels	Wall thickness (cm)
	11,5
	20
	25
	30
	38

General Characteristics	POROTHERM Lintel
Section (mm)	120 x 65
Fabrication length L (m) pitch 25 cm	0,75 - 3,00
Openess (m)	0,25 - 2,50
Setup pitch (cm)	25
Weight (kg/ml)	14,5
Bed distance (cm)	min. 2 x 25
Thermal conductivity λ (W/mK)	0,644



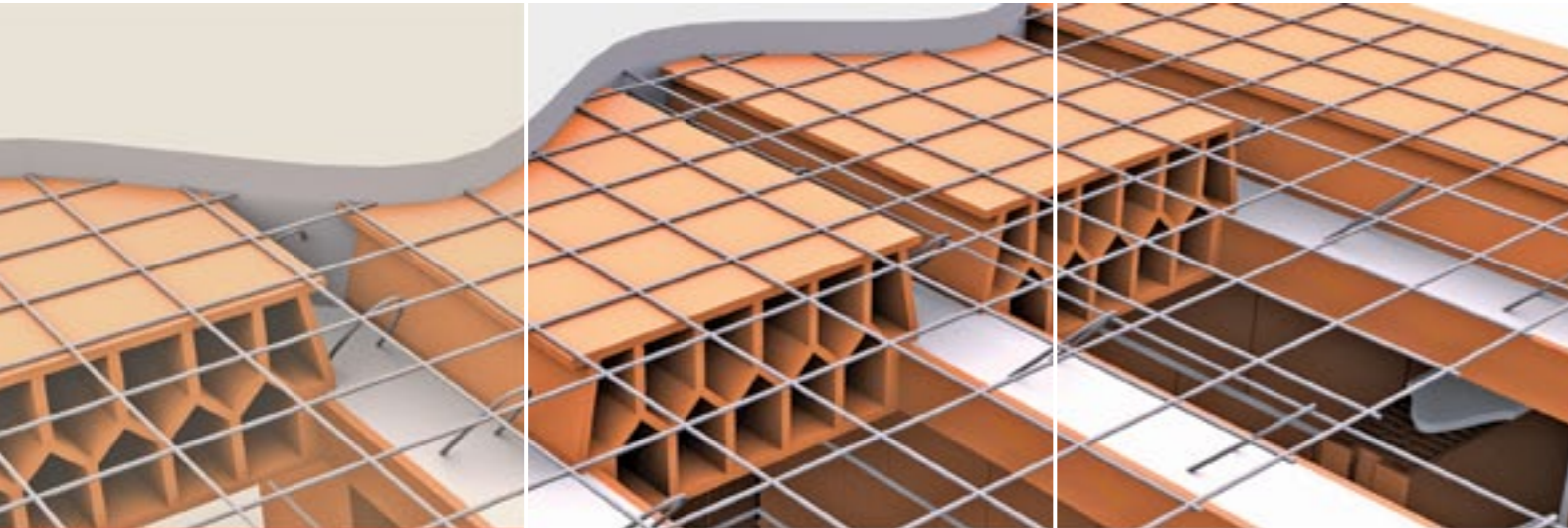
POROTHERM Masonry between Lintels and Belt

Reinforced Concrete Belt	D (cm)	Bearing Capacity (KN/m)								
		D L	0,75	1,00	1,25	1,50	1,75	2,00	2,25	2,50
	40	10,08	7,56	6,06	5,04	4,32	3,78	3,36	3,03	2,75
	50	13,00	9,75	7,81	6,50	5,57	4,87	4,33	3,90	3,55
	60	16,02	12,01	9,63	8,00	6,86	6,01	5,34	4,82	4,38
	70	19,12	14,34	11,49	9,56	8,19	7,14	6,37	5,75	5,22
	80	22,32	16,74	13,41	11,16	9,561	8,37	7,45	6,70	6,10
	90	25,62	19,21	15,40	12,81	0,98	9,60	8,55	7,70	7,00
	100	29,02	21,77	17,45	14,51	12,44	10,88	9,68	8,72	7,92

Concrete Belt prolonged till the Level of Lintel

Reinforced Concrete Belt	D (cm)	Bearing Capacity (KN/m)								
		D L	0,75	1,00	1,25	1,50	1,75	2,00	2,25	2,50
	40	25,76	19,32	15,45	12,88	11,04	9,66	8,54	7,72	6,82
	50	35,32	26,48	21,22	17,65	15,13	13,24	11,78	10,60	9,45
	60	44,87	33,65	26,96	22,43	19,23	16,82	14,97	13,48	12,08
	70	54,41	40,81	32,71	27,20	23,32	20,40	18,15	16,34	14,71
	80	69,14	53,69	44,19	36,75	31,51	27,55	24,52	22,09	19,96
	90	69,14	53,69	49,89	41,51	36,58	31,12	27,62	24,95	22,59
	100	69,14	53,69	49,89	46,27	39,67	34,70	30,88	27,82	25,22

In accordance with the dimension of the masonry walls, the lintel (as structural element) is composed of one, two or three **POROTHERM** lintels.



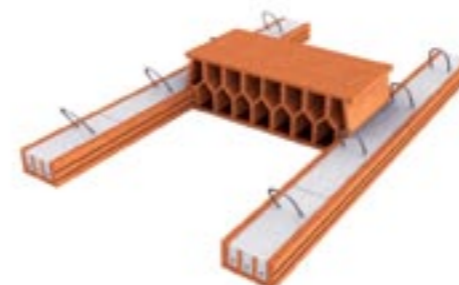
POROTHERM Beam and Block Floor System



POROTHERM 45*
Ceramic Block



POROTHERM 60*
Ceramic Block



POROTHERM
Beams

Constructive System

The pre-compressed beams in ceramic shells have the section $B \times H = 12 \times 6,5$ cm and length of delivery between 1,75 and 7,25 m, with which could be made ceiling openings between 1,50 is 7,00 m. Usually, the beams are placed on the designed direction of the ceiling. If the openings are larger than 4,0 m, there will be endowed with bots for stiffness, at 3,0 m intervals, in order to create the effect of interaction between the ceiling and the structure on the transversal direction of the Porotherm bots.

- Ceiling ceramic blocks POROTHERM 45 or POROTHERM;
- Reinforced concrete topping, 6 cm thickness recommended; Reinforced with steel welded mesh 10x10 cm;
- All calculations and conformity and component systems of the plates and reinforcement will be made according to the designing rules set up in the applicable designing codes and standards.

Pre-compressed Beams Characteristics of POROTHERM Beam and Block Floor System

- Fabrication from 1,75 to 7,25 m.
- Ceramic elements of shell type T250 - lost encasement.
- Pre-tensioned steel reinforcements ST 180/200, having $\phi = 2,5$ mm, with $\sigma_{AH} = 1500\text{N/mm}^2$, according to the Austrian norms ÖNORM.
- Stirrup reinforcements C15H, having $\phi = 4,2\text{mm}$ with $\sigma_{AH} = 410 \text{ N/mm}^2$.

The design have to be made according to STAS 10107/3-90.

Use Advantages of POROTHERM Beam and Block Floor System

- Manoeuvrability, easy work, complementarily of the **POROTHERM** system.
- Remarkable bearing capacity.
- Concrete consumption optimization in casting works needed for the montage completion of the ceiling, as structural element (reinforced concrete topping).
- Substantially decreased scaffolding and also less additional reinforcement is needed.
- Ceramic surface easy to plaster.
- Economy of materials and work force for plastering.
- Natural raw materials.
- Optimal insulation against noise.
- Thermal insulation leading to energy saving.
- Comfort - a healthy microclimate.
- Long lasting, safety and flexibility in use.
- Easiness in installation fit in (f.eg.cables, wires).
- Low costs of maintenance.

Domain of Use/ Behaviour

Construction Elements designed for construction of floor beams between the levels of building. These elements guarantee:

- direct transmission of the gravity load to the structural walls;
- transmission of inertia forces that appear at the ceiling level, as response of the seismic moves, to the structural walls;

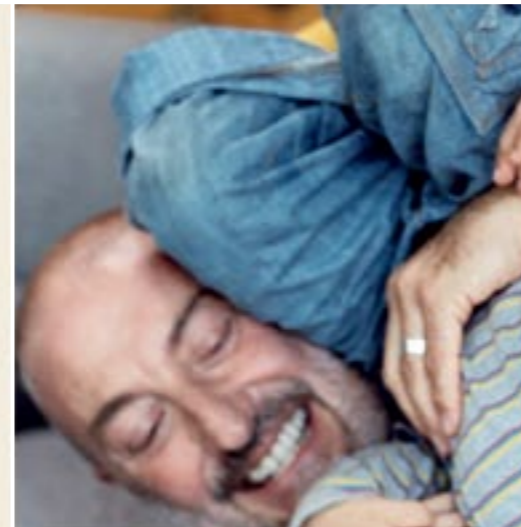
POROTHERM floors could be designed to:

- Structural masonry (load bearing)
- Reinforced concrete frame structure / metallic as well as building works, restoration etc.

Specific Consumptions, Delivery Conditions	POROTHERM 45	POROTHERM 60
Needed blocks/m ² beam (pcs.)	8,99	6,67
Needed lintels/m ² beam (ml/m ²)	2,22	1,67
Delivery (pcs./packed pallet)	84	56

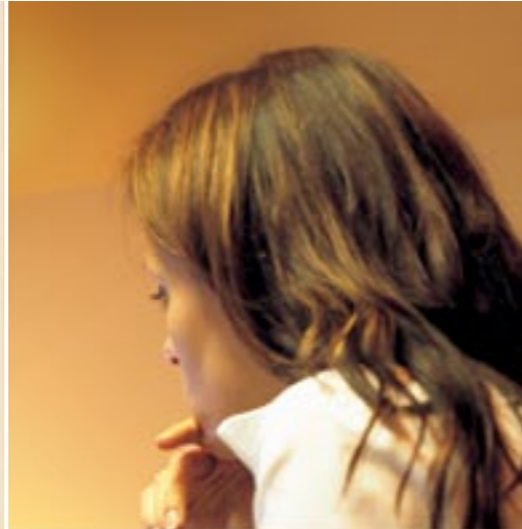
General Characteristics	POROTHERM 45	POROTHERM 60
Dimensions (mm) (l x b x h)	250 x 370 x 170	250 x 520 x 170
Distance between the centre line of the beam/ or multiple beams, either side of the block (cm)	45	60
Weight (kg/pcs.)	about 11	about 15
Thermal conductivity (W/mK) λ	0,51	0,51
Wall thermal resistance R (m ² K/W)	0,34	0,34
Parameter of sound reduction R_W (dB)	48,5	48,5
Gross density (kg/m ³)	max. 700	max. 700

*Technical Agreement 001-01/348-2009. Technical Agreement 001-01/333-2008.



1. Resistance and Stability

Bearing capacities at Limit States	STAS 10107/0-90 STAS 10107/1-90 STAS 10107/2-90 STAS 10107/3-90
Strength Limit State analysis	Normativ P100-1/2006 Normativ CR6-2006 Normativ NP007-97
Verification at the deformation limit situation - deflection	SR EN 15037-1:2008 SR EN 1996-1-1 SR EN 1992-1-1



Requirements and Performance Criteria

Requirements and Performance criteria for **POROTHERM** system are mentioned in the referenced documents presented here.



Certifications

Wienerberger Sisteme de Cărămizi functions according to the Management System of Quality, certificate with reference standard SR EN ISO 9001- 2008.



2. Safety in Exploitation

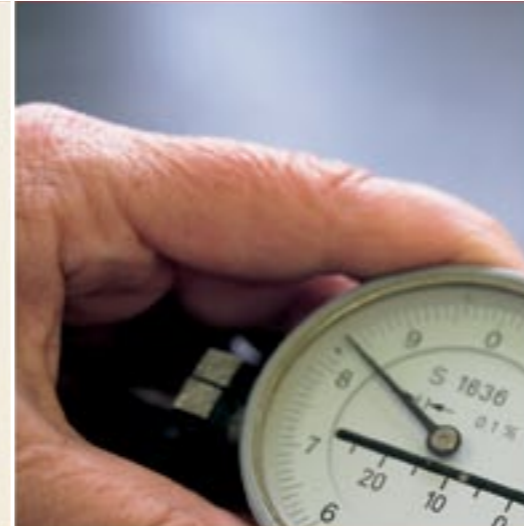
For **POROTHERM** system there are no specific performance criteria, there are only for application of facing systems (floors, stairs, rails)

3. Fire Protection / Fire Safety

P118 - 1999

4. Hygiene, People's Health, Reconstruction and Protection Environment

All the elements of the **POROTHERM** System are satisfying the performance requirements



5. Thermal Insulation, Waterproof, and Energy Economy

Normative C107/2005
Instructions C203-91

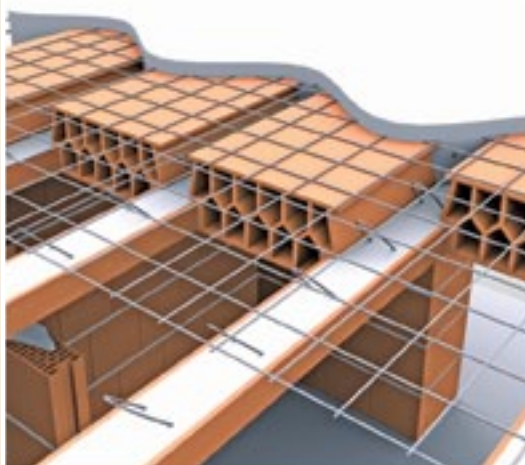
6. Protection against Air or of Impact Noise

STAS 6156/86

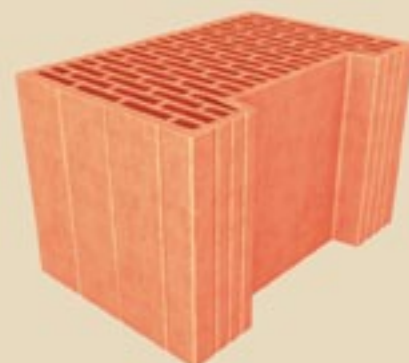




POROTHERM
Ceramic Blocks with
Mortar Pocket



POROTHERM
Beam and Block
Floor System



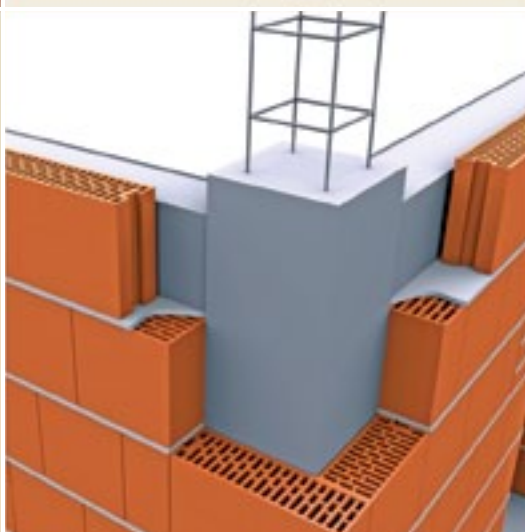
POROTHERM
STh



POROTHERM
25/30 Light



POROTHERM
Lintels (girders)
in Ceramic Shell



POROTHERM
Ceramic Blocks with
Tong & Groove (N+F)



Wienerberger
Sisteme de Cărămizi srl

Șos. București - Ploiești nr 42-44, sector 1, București
Băneasa Business & Technology Park SA,
clădirea A1, etaj 1, cod poștal 013696, București, ROMÂNIA

Tel: +40(21)3610450 ; 3610451; 3610452

Fax: +40(21)3610455

Email: office.romania@wienerberger.com

www.wienerberger.ro