
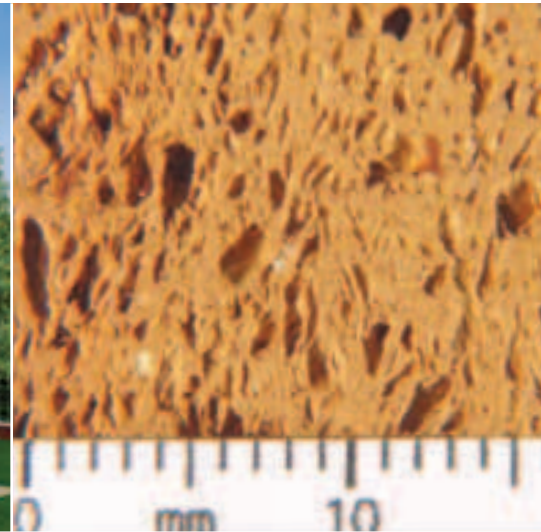


PoroTherm.
The blocks.

Wienerberger are the World's leading manufacturer of clay blocks and facing bricks. With over 200 factories across Europe, we offer an unrivalled product range and the security of supply which comes from interchangeable product sources across borders. Naturally, as you would expect from the No. 1, we are leaders in product quality, engineering innovation and product development.

	<p>1</p> <p>Clay is extracted from the on-site quarry and transported to the factory to be prepared and mixed with recycled materials.</p>		<p>6</p> <p>As water is added at the extrusion stage to make the material workable, this then has to be removed in the drying process, which uses recovered heat from the kiln.</p>
	<p>2</p> <p>The mixed raw materials are processed by grinding them down to a fine particle size – typically less than 1mm.</p>		<p>7</p> <p>Products continue to the kiln where they are fired to a typical temperature of 900°C.</p>
	<p>3</p> <p>A crucial stage in the manufacturing process is to homogenize the water content of the prepared mix.</p>		<p>8</p> <p>Upon leaving the kiln, the blocks are then ground on 2 sides to an accuracy of +/-0.5mm in finished height. This is to guarantee 1mm joints during construction.</p>
	<p>4</p> <p>The prepared clay is then provided to the extrusion process via mixing machines.</p>		<p>9</p> <p>The blocks are then vacuumed to remove dust before passing through quality control prior to being packaged and palletised ready for the customer.</p>
	<p>5</p> <p>Air is removed from the clay and then passed through a “die” which creates the interlocks and clever web structure. This produces a continuous column that is then cut into individual blocks.</p>		<p>10</p> <p>Factories use the clay taken from responsibly managed quarries. At the end of their life, these are returned to nature or agriculture to create natural habitats for animals and plants to thrive.</p>



Manufacture

Porotherm blocks are manufactured from the natural material 'clay', which is mixed together with recycled ingredients from the mining, paper or wood industries - typically 20 - 30%.

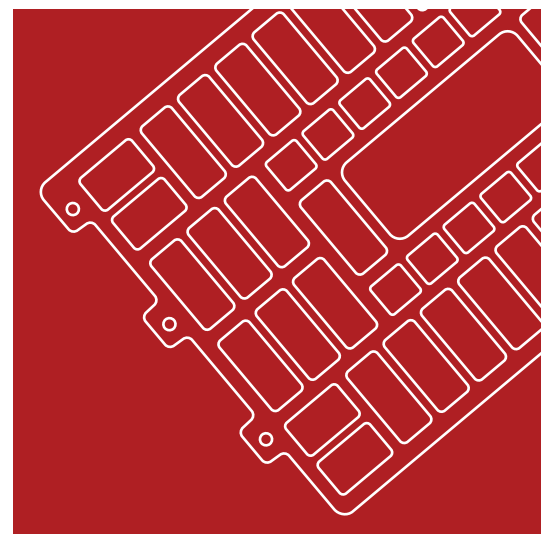
Thermal performance

The 'secret' of the thermal insulation of POROTHERM clay blocks is the air trapped in the many small pores. When the added recycled materials e.g. sawdust, burn away (without residue), countless tiny holes are formed. These innumerable, interconnected pores and the carefully designed web and shell geometry intelligently reduce the flow of heat and thereby heat losses through exterior walls. Lambda values therefore vary according to the fired properties of the clay used in manufacture, recycled content and web geometry. For example Core range Lambdas range from 0.31 to 0.12 WmK. Perlite infilled blocks achieving 0.08 WmK are also now becoming available from Wienerberger. The thermal mass characteristics of masonry also contribute to comfortable living conditions - very important with ever increasing demands for energy conservation, passive solar design, insulation etc.

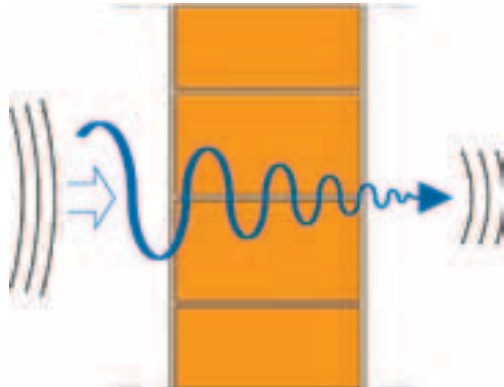
Strength

Core range Porotherm blocks have a typical compressive strength of 10N/mm². This is subject to constant quality control and monitoring – giving assurance to engineers and architects. Brick and clay blocks structures have excellent dimensional stability and thanks to the unique 1mm bed joints, construction up to storey height in one day is achievable.

The minute internal structure of the products is shown here. This is one of the 'secrets' to the excellent insulation properties of the blocks.



The Porotherm 'web structure' is created when the blocks are formed. By making the web pattern as convoluted as possible, the transfer of heat is slowed down, therefore, enhancing their insulation performance.



Acoustic performance

The nature of fired clay block blocks makes for good acoustic resistance and typical wall performance values are highlighted in 'The Way Forward' and 'Wall Design' brochures.

For example 100mm Porothersm blockwork, when plastered both sides, will achieve a sound reduction value of 40db. The same block in a cavity party wall with a 60mm clear cavity results in a sound reduction value of well above the 45db minimum – typically 60db.

Comfortable living

Where comfortable living is concerned, Porothersm clay blocks are far superior to other materials. The pore structure of the block favours the exchange of humidity between the indoor and outdoor environments, thereby guaranteeing an excellent storage capacity and an outstanding openness for the diffusion of vapours. Its warm surfaces, buffering of humidity and heat and its total lack of harmful substances guarantee a healthy indoor climate and sense of well-being. The thermal mass of a Porothersm wall means that during the day time, warmth is kept in the wall and during the night such warmth is released very slowly. This means that there are significantly reduced extremes of temperature, either during the winter, or in the summer. Therefore, a Porothersm house has considerably less risk of overheating in summer and stays warmer in winter than a lightweight structure.



Fire resistance

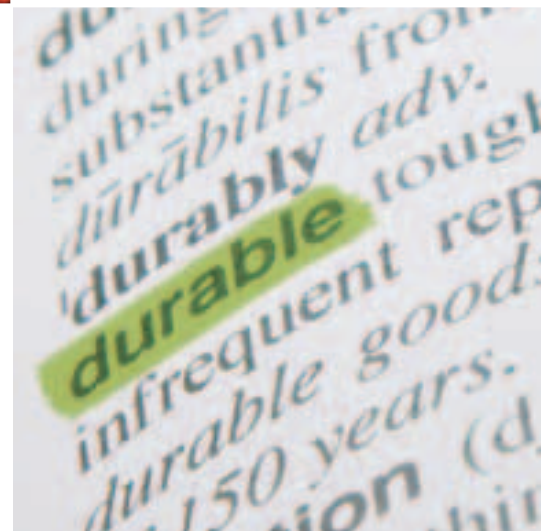
Porotherm blocks do not burn, do not produce smoke or generate harmful gasses in the event of a fire. So both during and after construction they are fire resistant. For example in UK tests (see CERAM report in annex) a 100mm load bearing wall remained structurally intact after a 2 hour fire test. Porotherm block walls achieve a Class A1 fire rating.

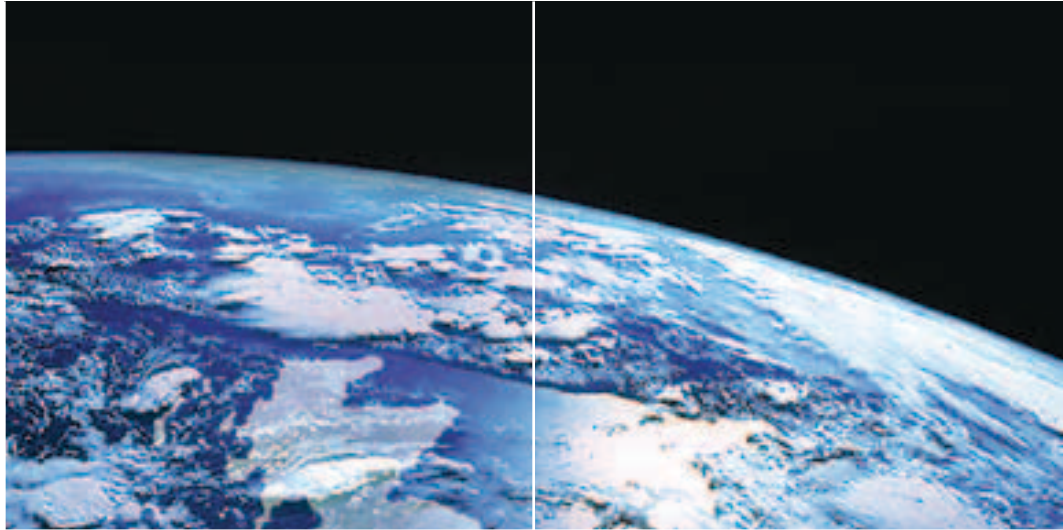
Longevity

A recent study has shown that modern clay block walls will survive generations. This study was done by the market research company 'Xtra Muros' on behalf of Wienerberger. In fact the study suggests that they can easily achieve a lifetime of over 150 years. During their lifetime stability remains intact and walls will need only minimal maintenance or repairs. That's what makes clay blocks one of the most 'maintenance friendly', materials.

This longer lifetime also means that the environmental impact of production and transport, is spread over a longer period.

Of course, there are examples of clay brick structures still standing from well over a thousand years ago, so the longevity of bricks is unquestionable.





Ecology

There is no doubt that our masonry building method, with facing bricks and inner wall blocks made out of clay, is the ideal choice in our humid climate.

Clay products assure a much better stability and longer lifetime than timber, and there are a lot of other reasons why it is better to choose bricks and blocks - especially where passive houses and low energy houses are concerned.

Natureplus is an international label that was introduced in 1996 by Natureplus e.V. This association stimulates environmental and health protection in the construction sector and attaches great importance to consumer information on building products, building materials and objects for interior decoration. They focus attention on the promotion of building materials that are environmentally friendly and harmless to human health.

In order to achieve this, the association awards a label to natural products which fulfill stricter criteria than the current European standards for environment, health and functionality: the natureplus quality label. Natureplus is also stricter than labels that are awarded by government authorities, such as the European Ecolabel or the better known German label Blaue Engel. The natureplus label leads consumers and clients to green, healthy and sustainable products.



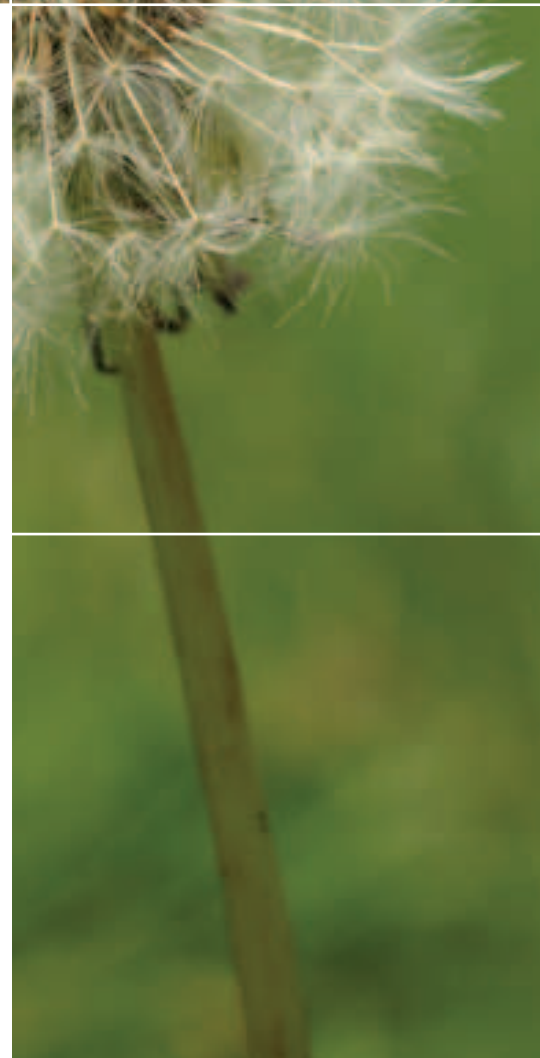
The awarding association is supported by Greenpeace and the WWF, who have been a partner of Wienerberger for many years. Natureplus means for building materials and products what the Bioguarantie label represents for food or FSC for the wood sector.

Not so long ago, timber frame was sometimes considered more environment-friendly than masonry. Now that the clay inner wall blocks from Wienerberger have received the Natureplus eco label, this is no longer true. Building with clay bricks and blocks is bio ecological!

Monolithic Porothersm walls offer excellent buildability and long term performance. Currently used as a standard 'fast track' solution for a major supermarket chain, they are also increasingly popular with Eco- developers.



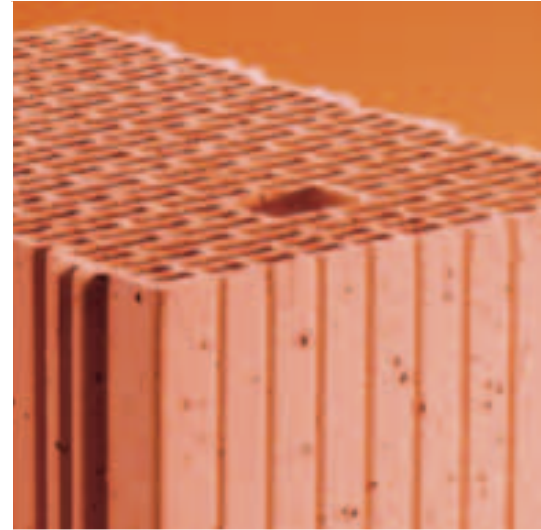
Porothersm has applied for a UK BRE 'Green Guide' rating. We confidently expect to receive an A+ rating as UK clay facing bricks already hold an A+ rating.



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