



Clayworks

CLAY HEATING PANELS  
THERMAL HEATING SYSTEM

Natural Clay Plasters

## OVERVIEW

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Clayworks Clay Heating Panels are clay and wood fibre dry-lining boards with integrated heating pipes designed to carry hot or cool water through walls or ceilings. The panels thereby act as the heating or cooling element within a building.



They have a sandwich construction made of wood fibre and naturally dried clay plaster. The integrated heating pipes are identical to those used in underfloor heating and require no specialist plumbing.

Once installed, the system is invisible to the eye as it sits within the walls or ceilings. The application of a thin layer of fresh clay plaster completes the installation, creating a beautiful, seamless and healthy finish.

Once linked to a heat source, the panels warm up gently to radiate heat either downwards or across the room. The individual heating loops are linked to thermostats which allow the end user to control the temperature as they would do with conventional heating systems.

Clayworks Clay Heating panels are well suited for natural heat sources such as solar and ground source heat pumps. In warmer climates, running cold water through the pipes offers a gentle and healthy alternative to mechanical air conditioning.

The panels are 62.5 cm wide and 115 cm long and are supplied with the heating pipes already fully integrated. Such an extremely high level of prefabrication allows for fast, cost effective installation. This saves working hours and drying times on the construction sites, leading to significant savings on time and material resources on site.

# BENEFITS

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## HEALTHY INTERIORS

Due to the excellent breathability of both wood fibre and clay, our panels help minimise damp, aid thermal comfort and help protect the structural integrity of the building.

Infrared heat is used in medicine and is known to be gentle and effective.

Clayworks Clay Heating panels offer all of the health [link to health page] and sustainability [link] benefits of clay when used as an internal building material:

- No VOCs
- No toxins
- No off-gassing.
- Critically, clay helps to keep room humidity at between 40% and 70% the level at which the majority of adverse health effects are kept at bay including asthma. At these levels the likelihood for airborne infectious bacteria and virus to survive is the lowest.

## COOLING SYSTEM

The panels are perfect as a cooling system: if cold water is sent through the water pipes, the system functions as gentle air conditioning without the noise, draftiness and high maintenance associated with traditional air conditioning systems.



## HISTORIC BUILDING REFURBISHMENT

The panels are particularly valuable for historic building refurbishments due to their permeability. Clay plaster allows walls within buildings to breathe. The system also offers an alternative to underfloor heating where historic floors need to be preserved and areas of walls or ceilings are more suitable for integrated heating.

## DESIGN FLEXIBILITY

Just like underfloor heating, integrated clay panel heating increases usable space as it removes the need for radiators. Especially when placed in ceilings, the system offers future design flexibility adding to the lifespan of the building.

A minimalist aesthetic is easily achieved.



Having the heating pipes integrated into dry lining boards also means that partitions can be built using the panels. This is an easy and efficient way to create partitions which not only include heating but also offer acoustic benefits. The weight of the clay is beneficial for cross-room noise reduction and the permeability of the panels buffers reverberation.

There are no design limitations due to the size of the individual boards or the pipes running through them because the heated boards are installed in combination with plain boards which can be cut to size. The only limit there is lies within the minimum size of a single heated board.

A range of specialist products is available for applications such as windows, external walls or areas of thermal bridging.

## TARGETED HEATING

Wall heating in particular delivers targeted heat to specific areas where the effect of other heating systems can be lost due to drafts or challenging layouts. This is particularly valuable in open plan areas such as shopping centres, airports or office receptions. Heated walls behind reception desks directly benefit the wellbeing of staff and visitors whilst gentle heat in restaurants or spas behind built in seating can increase the overall level of comfort.

## ENERGY SAVINGS

The way we feel warmth depends upon the total energy that reaches us – the more heat radiation, the less heat conduction is necessary. As a result, the room temperature can be reduced by 3 degrees while still giving the same feeling of warmth, enough to reduce heating costs by up to 18%. conduction is necessary. As a result, the room temperature can be reduced by 3 degrees while still giving the same feeling of warmth, enough to reduce heating costs by up to 18%.



In addition, the actual heat output of wall and ceiling heating tends to be far more effective than underfloor heating. The pipes run much closer to the surface and clay has superior heat conductivity to concrete or screed. There also is no need to wait for the heat to come through added layers such as timber flooring or tiles.

## SUITABILITY

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For heating internal rooms by cladding walls and ceilings, including bathrooms and toilets. Clay panels are not suitable for areas where there is contact with running water.

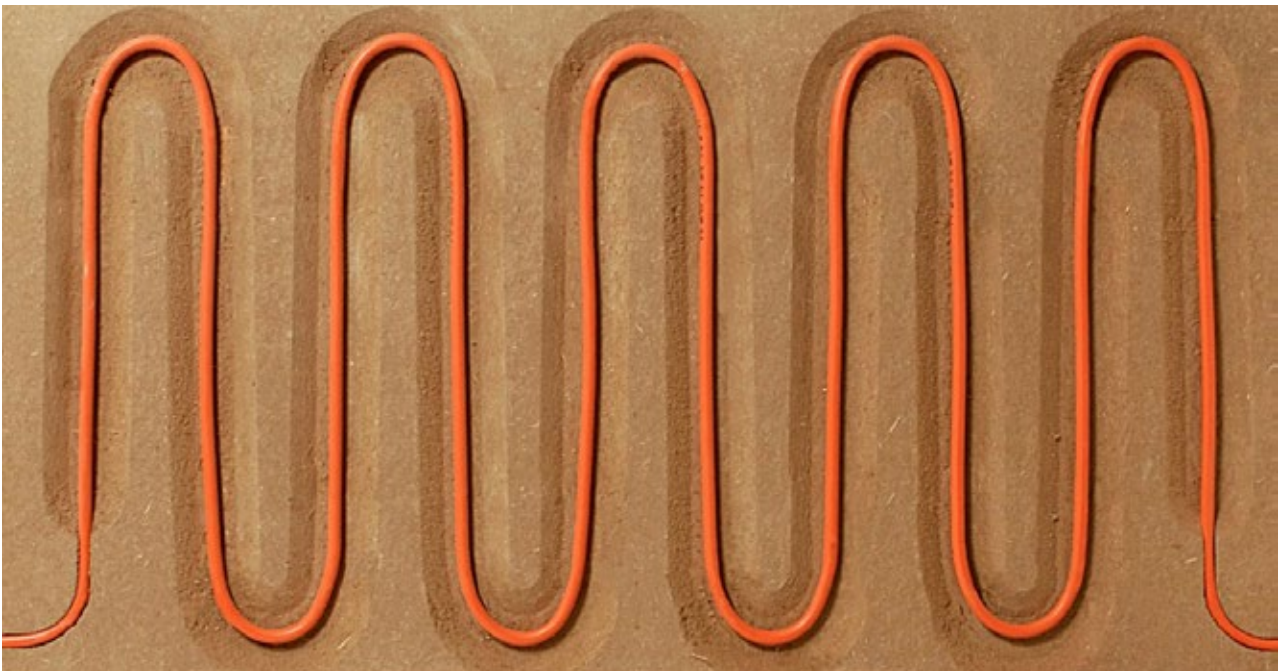
## DATA & PERFORMANCE

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- Excellent sound insulation. Sound can be reduced by high mass material or soft wave reducing material.
- Basic thermal insulation: The core of the Clayworks Panel is 17mm wood fibre which provides good basic insulation.
- High inherent stability – excellent for stud constructions.
- The system regulates humidity, helping to keep a room at about 50%, optimum for helping to prevent asthma as this helps to keep the mucous membrane from drying out.
- Absorbs and stores indoor air pollution.
- The clay's capillary structure, its permeability and the number of micro cavities enables the material to absorb and store odours and smells and Ionise the air, contributing to a feeling of fresh air.
- Energy-efficient: the panels store the warmth from the day and release it slowly in the night hours.
- Constructed primarily of ecological materials – wood and straw.

Clay works clay panels are highly sustainable due to the low energy required during production and the raw materials used. Clayworks clay boards can be 95% recycled.

- High efficiency due to warmth insulation towards the wall which insulates against heat escaping into the wall or ceiling.
- The clay plasters and panels absorb the warmth of the heating system and deliver it into the room by longwave, healthy warmth radiation.
- Fast temperature response – within 5-10 minutes – due to the low mass compared to full clay panels.
- Convenient panel sizes: Maximum size 62.5 x 115cm / 21 kg. Can be managed by a single person for wall mountings and 2 people for ceilings.
- The system includes end panels and connecting panels.
- Flexible modular system: Up to 8 panels can be connected in a row.
- Enough space for built-in sockets. Sockets with a diameter of up to 68mm can be drilled between the pipes.
- Marked pipe course.
- Savings on labour time and labour cost compared to underfloor heating systems due to less cost for the sub-construction.
- Only 40% of the room size is required for the heating panels: the remaining 60% will be unheated clay panels.
- Significantly less dust sweeping than air convection systems.
- In small spaces, no space for furniture or decoration is occupied.

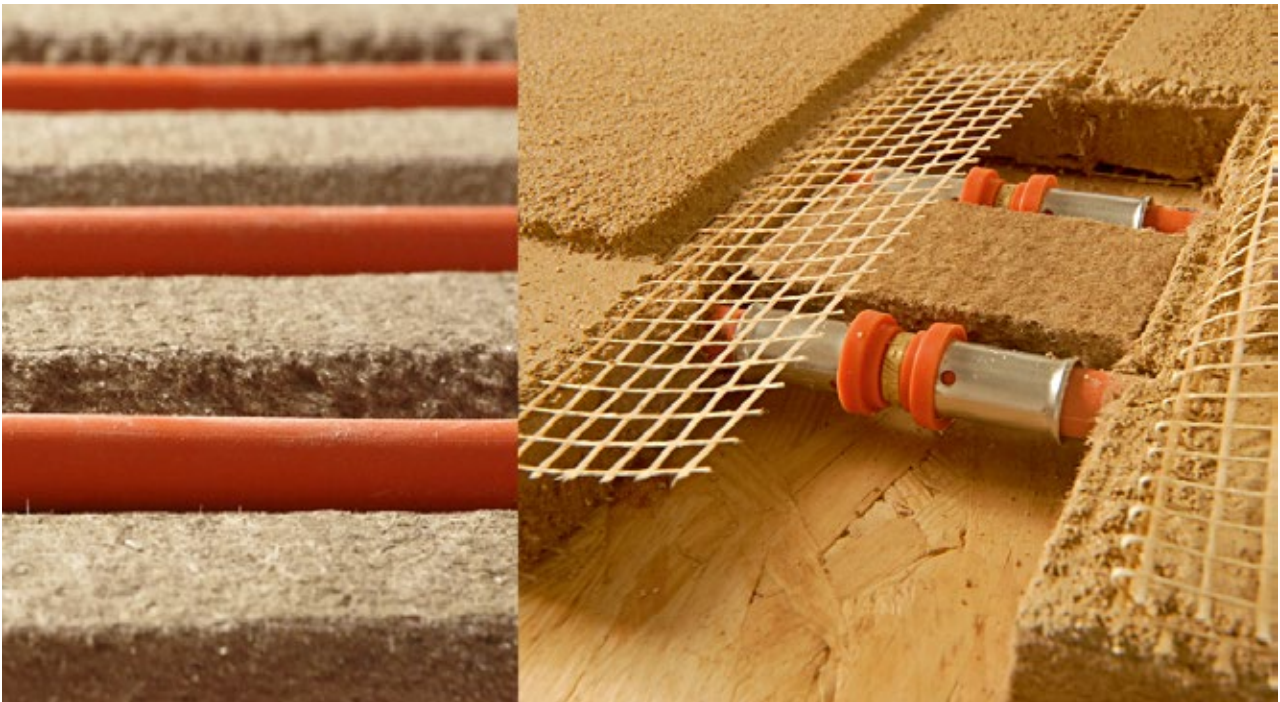


## DIMENSIONS

- Dimensions 62.5 x 95/115 x 3.1 cm
- Surface area 0.59 m<sup>2</sup>/0.72 m<sup>2</sup>
- Weight 17.5 kg/panel (= 29.6 kg/m<sup>2</sup>)/ 21.5 kg/panel (= 29.6 kg/m<sup>2</sup>)
- Heating pipe 11.6 mm outer diameter – 1.5 mm wall thickness.
- 6.5 m pipe length
- Clay application 15 mm finished system.

## INSTALLATION

- Fixed with staggered joints on OSB clad walls or timber/metal framed (w = 6 cm) studs at 62.5 cm centres.
- Fixed on ceilings or to the underside of rafters 31.25 cm centres apart.
- On a wall, they can also be fixed to a solid substrate using an adhesive.
- Fixing materials: drywall screws (3.9 x 45 mm) or galvanized staples (length 50 mm or longer, width 10 mm or more, wire gauge 1.4 mm or more).
- Fixing distance: approx. 15 cm apart on all tapered edges. On ceilings or the underside of rafters, an additional row through the middle of the length of the panel is required.



## INSTALLATION OVERVIEW

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We strongly recommend that you contract with an approved installer. The following guidelines are for design and construction planning purposes.

### RANGE OF USE

Anywhere within a building except for areas where there is running water. The panels are especially suitable for bathrooms as the clay system absorbs humidity, however they cannot be used within shower enclosures or directly behind a sink as a splash back.

In a kitchen, clay plaster significantly decreases the build-up of grease, which tends to occur over time in all kitchens.

## SUB-CONSTRUCTION PREPARATION

### Stud walls

The Panels are screwed to studs with a spacing of 62.5cm.

### Ceilings

The spacing for ceiling or roof slopes is 31.25cm.

### Wood walls

The Panels can be screwed to the wall.

### Brick walls or gypsum panels

The Panels can be glued without plugging.

## STRUCTURAL-PHYSICAL DATA

Vapour diffusion resistance  $\mu_{\text{total}} < 7$ .

Density  $9.6 \times 10^2 \text{ kg/m}^3$  (average).

Thermal conductivity  $\lambda_{\text{total}} = 0.073 \text{ W/(m}\cdot\text{K)}$ ;  $s(d)=0.031\text{m}$ .

## HEATING

Heating performance  $80 \text{ W/m}^2$  (= ca. 48,0/57,6 W/panel) based on a flow temperature of  $35^\circ \text{C}$  and a room temperature of  $20^\circ \text{C}$ .

## HEATING CIRCUIT

up to 8 Panels or 60 m pipe length. The feed pipe should be a 16 x 2 mm pipe and therefore doesn't have to be added to the total pipe length.

## SOUND INSULATION DATA SHEET

Measurement of sound absorption in a reverberation chamber to EN ISO 354:2003. Test object: Heating Panel end plate. Test Centre: Lucerne - Technology and Architecture for International Building. Date of inspection: 20 March 2014.





## EXAMINATION PROCEDURE

Expiry of the measurement: The necessary for the calculation of reverberation times are determined by the method with integrated impulse response (bursting of a balloon); The decay curves are determined by direct recording of the decaying sound pressure level with the netdb PRO 12 channel frequency analyzer. For a valid measurement, the decay curve to min needs. be -40 dB evaluable. The measurements are performed on 12 different microphone positions and 3 different sound source positions. The specified in each third reverberation time is the arithmetic mean of 36 measurements. reverberation times are determined with and without test specimen under the same climatic conditions.

## DETAILS

Surface of the test object: 10.7 m<sup>2</sup> air.

Temperature: 18.6°C.

Relative Humidity: 50% r. F.

Barometric pressure: 95807 Pa

## CARE & MAINTENANCE

Should the panels incur damage, by being knocked by furniture for example, they can easily be repaired by taking out the damaged material and infilling with clay plaster.



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