



Clay Climate System

ARGILLATHERM RIVIERA

*Natural heating and cooling
with the innovative
Clay climate system*

 **ArgillaTherm**[®]
Natural Clay Climate Systems



CLAY CEILING HEATING & COOLING

Heating and cooling via the ceiling saves energy and system costs and also ensures an optimum room climate. This is because the rooms are heated evenly by heat waves, without any unhealthy air turbulence. Ideal for allergy sufferers too.

During cooling, the heat is simply constantly dissipated. As warm air rises, **cooling can only be achieved effectively and economically via the ceiling.**



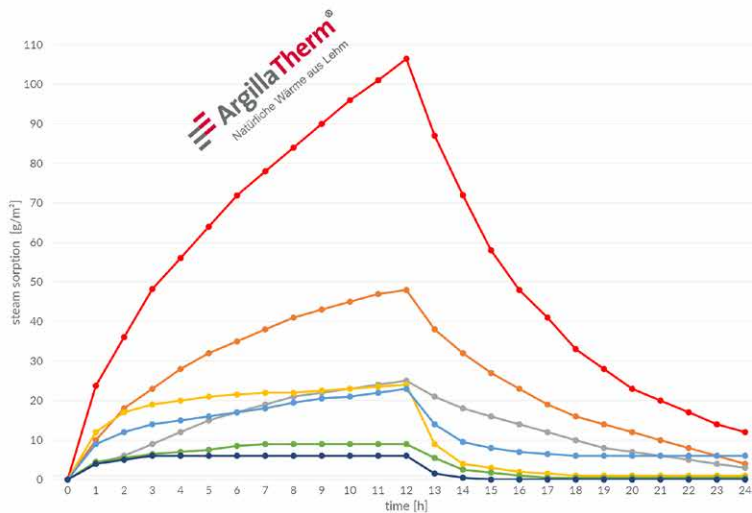
The heart of the system are the patented high-performance clay modules from ArgillaTherm. Due to the high rate of 3-layer clay minerals and an innovative manufacturing process with high dry compression, these clay modules achieve extreme sorption data. This means excellent moisture regulation as well as a binding of nasty smells and air pollutants. This means that this system **can fulfil five important functions: Heating, cooling, humidity control and air cleaning as well as optionally pleasant acoustics** ■



EXTREME SORPTION DATA

For the high-performance clay modules from ArgillaTherm, measured data are even twice as good as those of clay plaster. This has been tested and certified by MFPA Weimar at the Bauhaus University ■

“ Certified at the Bauhaus University Weimar

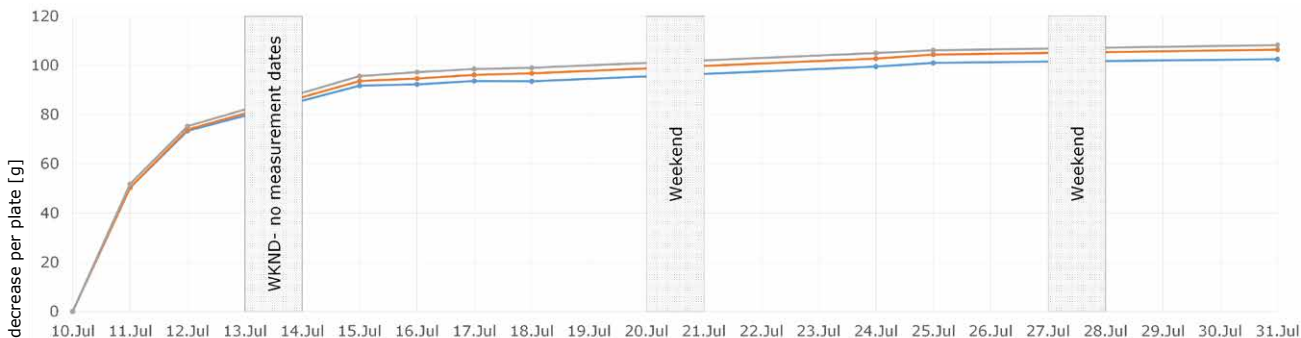


- ◆ ArgillaTherm clay modules
- ◆ Average value of 7 clay plasters
- ◆ Lime-cement plaster
- ◆ Calcium silicate board
- ◆ Lime plaster
- ◆ Machine gypsum plaster
- ◆ Gypsum bonded adhesive plaster

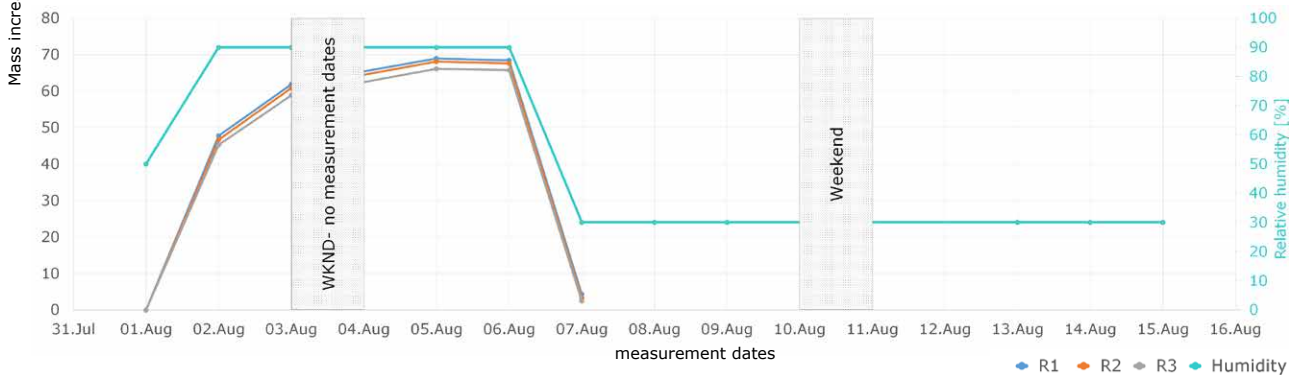


LONG-TERM SORPTION DATA BY MFPA WEIMAR

Increase in mass (absolute) at 23 °C / 50 % RH to 23 °C / 90 % RH [whole plate - Rivera type].



Sorption curve (absolute) at 50 % RH - 90 % RH - 30 % RH at T = 23 °C [whole plate - Rivera type]





RESULT OF THE MEASUREMENTS:

On the previous page: Measurement graphics of the MFPA Weimar.

Measurements were taken on 3 clay-grooved plates (R1, R2, R3, from different batches) ■

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- The high-performance clay modules can absorb more than 300g of water vapour per m² within 24 hours.
- The maximum water vapor absorption is about 700g per m².
- After about 7 days with a permanent relative humidity of 90% saturation is reached.
- With complete saturation the plates have absorbed about 2 mass-% of their dry weight of water vapour, without noticeable changes in volume (swelling or expansion).
- After 21 days of permanent relative humidity of 90% no moisture was detected on the boards.
- The stored moisture can be released again in a very short time (desorption).



GOOD TO KNOW



Power heating/cooling

Heating capacity = $\text{flow}_{\text{temp}} - \text{room}_{\text{temp}} \times \text{factor } 4$ (according to DIN EN 14037)

Cooling capacity = $\text{room}_{\text{temp}} - \text{flow}_{\text{temp}} \times \text{factor } 6,5$ (according to DIN EN 14240)

Due to the extreme sorption capability, **the dew point can be undercut for a certain time in cooling mode**

Flexible system (small format panels) = **easy planning & assembly**

Continuous pipelines without clutches up to the distributor

Integration into common planning programs

Interesting design options (ceiling sails and lighting systems)

Inexpensive & effective acoustic solution can be integrated



As ceiling panel



ADVANTAGE: NATURAL COMFORT



- **Ceiling heating systems have the highest share of thermal radiation**
 - therefore homogeneously distributed heat in the whole room
 - no dust turbulence as with radiator/underfloor heating
 - therefore: ideal for allergy sufferers and asthmatics
- **Extreme moisture absorption** prevents mould growth and cools in the summer by the evaporation cold that means cosy 50% humidity at any time of the year
- **The clay minerals absorb air pollutants & nasty smells**
- **Cooling without dew point control**
- **Heat reaction time < 1 hour**





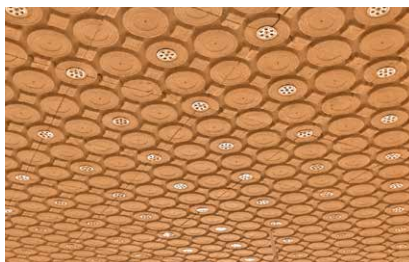
SIMPLE INSTALLATION

The installation of the patented system is very simple. The heating-cooling surfaces are installed in clay modules of 37 x 37 cm. If necessary the modules can be easily cut to size, so that any ceiling geometry is possible.

The endless matrix enables a simple and free installation of the pipelines in all directions. Therefore no clutches are required. After the clay modules and cable are mounted the surface coating with clay plaster and clay paint follows ■



System components of the clay climate system RIVIERA



High-performance clay modules mounted, followed by installation of pipelines



Coating with clay plaster and clay paint



CERTIFICATIONS

All system components have been tested and certified by recognised institutes ■

Test reports & certificates		
Norm	Testing and certification	Institute
DIN EN 1264	Testing for room surface integrated heating and cooling systems with water flow to determine the heating/cooling capacity	MFPA Weimar
DIN EN 14037	Test for freely suspended heating surfaces on the ceiling with water flow to determine the heat output	WSPLab Stuttgart
DIN EN 14240	Test for cooling surfaces freely suspended from the ceiling with water flow to determine the cooling capacity	WSPLab Stuttgart
DIN 4102	Test for the classification of building materials according to their reaction to fire into fire resistance classes	MFPA Leipzig
DIN 18948	Performance characteristics and test methods for factory made clay building boards	MFPA Weimar
DIN 18947	Requirements for clay plaster for rendering walls and ceilings	ZRS Berlin
DIN 4726	Oxygen density testing for plastic pipes	MPA Dortmund



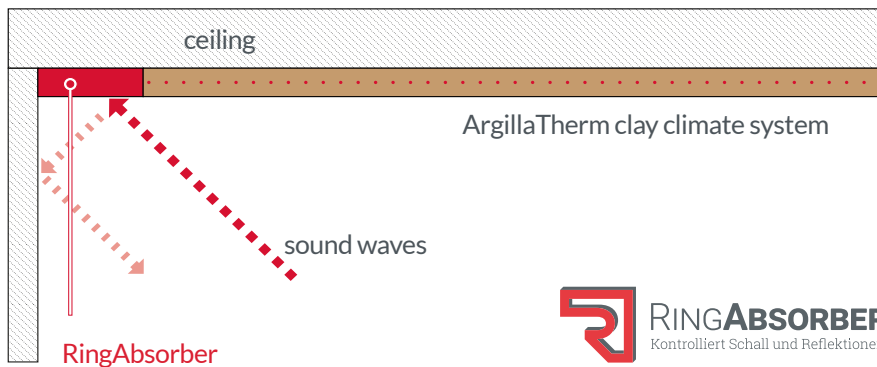
CLAY CLIMATE ACOUSTIC SOLUTION WITH RINGABSORBER

The RingAbsorber is a simple and inexpensive way to expand the clay climate ceiling with an effective acoustic function. The RingAbsorber are built into the ceiling or simply glued on. Preferably at the edge, where it has the greatest effect, because of the uncontrolled sound reflection that occurs there.

The rule of thumb is: Up to a room area of 100 m² and a room height of up to 3.50 m, only a ring with a width of 31 cm at the edge of the ceiling is required. However, absorber surfaces can also be calculated exactly according to requirements ■



RingAbsorber glued

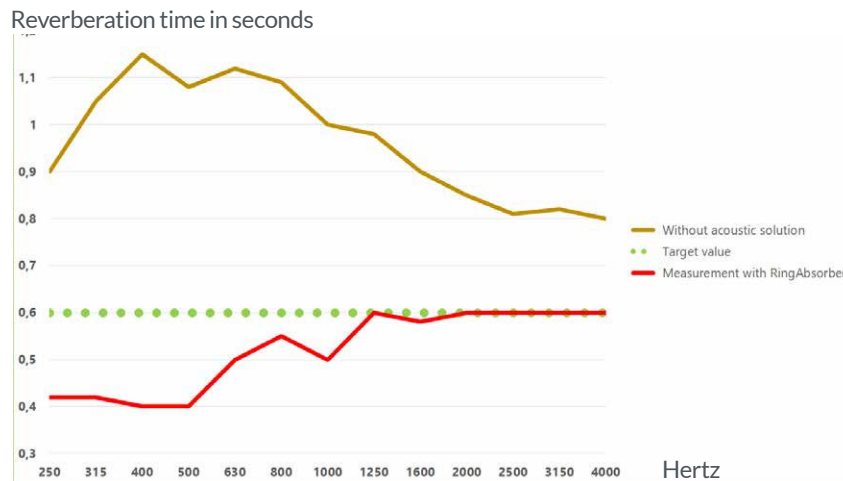




AN ECONOMICAL + ECOLOGICAL ACOUSTIC SOLUTION

In contrast to the elaborate full-surface acoustic ceiling, far less material is required. The unique material and the acoustically sensible placement of the RingAbsorber saves 60 percent of the costs compared to conventional acoustic ceilings. **The panels are made of 100 % recycled glass and are therefore eco-logical, fibre-free, non-combustible (A1) and pressure-resistant.** The standard colour is light grey. However, any RAL colour is possible ■

- Reduction of reverberation time
- Quick installation
- **60 % cost reduction**
- Non-combustible (A1)
- Broadband absorption
- Ball-proof



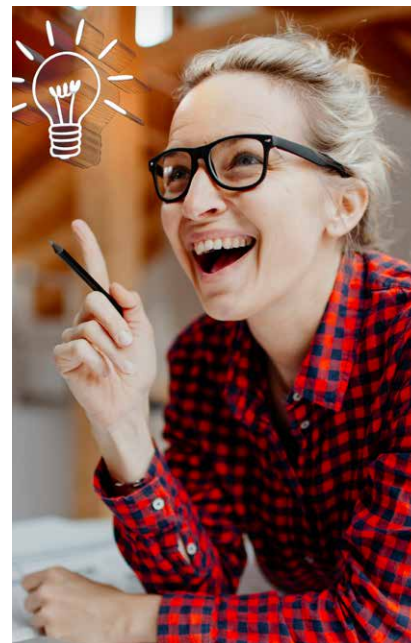


COST SAVINGS THROUGH RIVIERA CLAY CLIMATE SYSTEM

Economical drywall system. As with wet plaster systems, however, the pipes are embedded in the clay and facing the room very close to the surface. This shortens reaction times, significantly increases effectiveness and saves a great deal of energy (1°C less flow temperature corresponds to 1 - 2.5% energy savings).

The sandwich construction decouples the heating system from the brickwork, which reduces energy losses through the brickwork and ensures a quick reaction time.

Natural heat regulation without technical effort: The heat generated in the room during the day rises to the ceiling by convection. The high-performance clay modules from ArgillaTherm store this heat. If the room temperature falls below the temperature of the clay layer, the stored heat is released back into the room.





REFERENCES

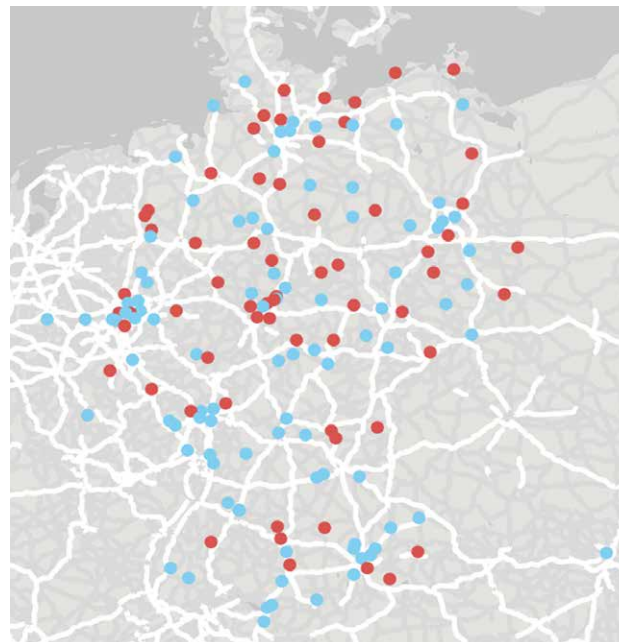
References can now be found throughout Germany and in several European countries.

Only larger references are listed in the overview map.

- Clay climate direct heating system TOSKANA
- Water-based heating and cooling system RIVIERA



Ministry of Finance Dresden





SELECTION OF REFERENCES





THE NEXT STEP



Just write us your questions, wishes and requirements now or call us right away.

We would be pleased to advise you on the spectrum of possibilities, send you detailed technical information or prepare a dimension for you ■

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 **ArgillaTherm**®
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LIFE IS TOO SHORT
FOR A BAD ROOM CLIMATE!