ebb™

Eco Building Boards™

Sustainable Drywall Solutions for Today

PHASE CHANGE MATERIAL (PCM)

Smart Lightweight Thermal Mass Solutions

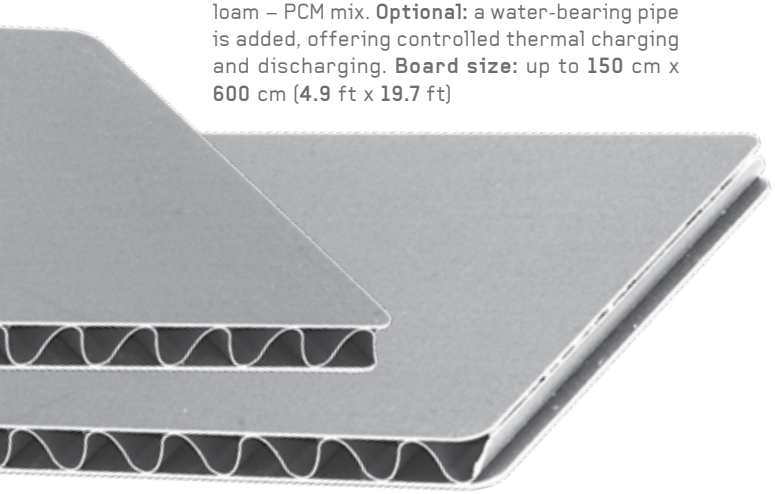
LOW-TECHNOLOGY – MAXIMUM COMFORT

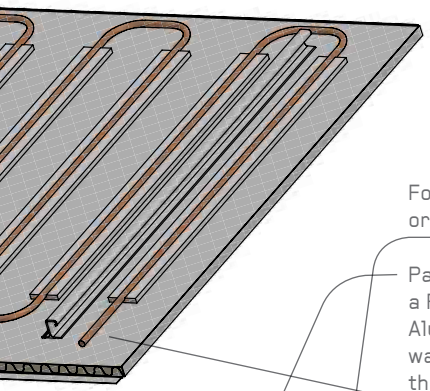
SMART BUILDING MATERIALS OPTIMIZING THE INDOOR CLIMATE

Using a microencapsulated PCMs a range of building materials has been developed. They can be fitted like standard drywall pro-ducts, but deliver huge amounts of thermal mass into light-weight constructions. The PCM boards passivly regulate the indoor climate (no maintenance & no running costs), thus significantly contributing to the energy efficiency of buildings. .

PCM-Aluminium-Element
100% recyclable.

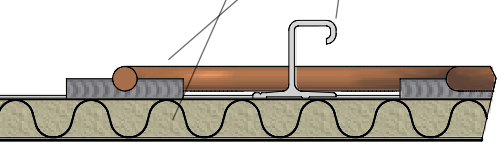
Basic board: the aluminum board is filled with a loam – PCM mix. **Optional:** a water-bearing pipe is added, offering controlled thermal charging and discharging. **Board size:** up to **150** cm x **600** cm (**4.9** ft x **19.7** ft)





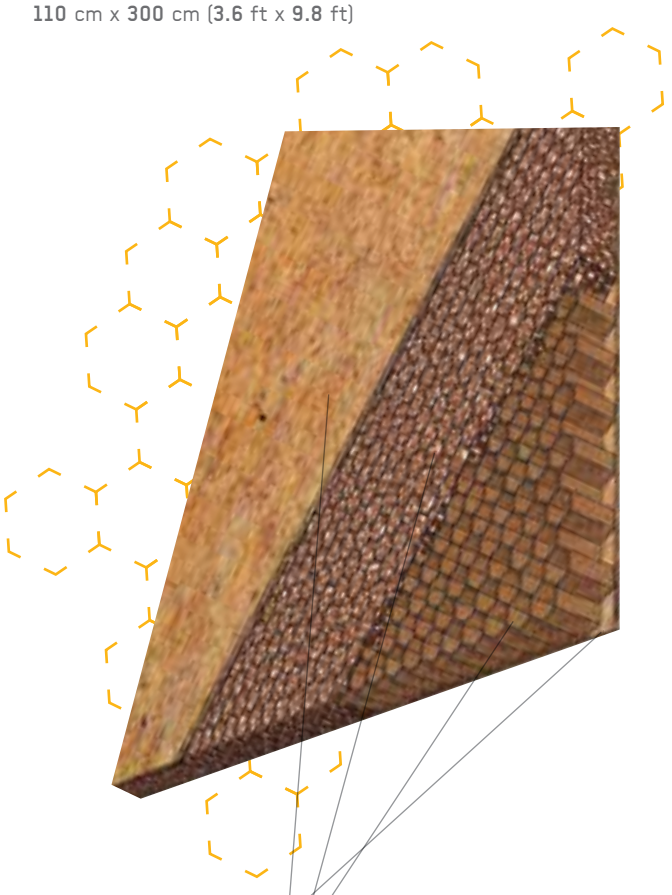
For suspended ceilings, or fitted as a canopy

Passiv Aluminum-Element filled with a PCM – Loam mix, and the active PCM Aluminum – Element with added water-bearing pipes for controlled thermal charging and discharging



PCM-Natural fiber-Element
100% recyclable.

The latest development is a indoor climate regulating sustainable PCM material: the top & bottom layers are a **2** mm natural fiber board and the core honeycomb mesh is filled with a PCM loam mix. The maximum board size is **110** cm x **300** cm (**3.6** ft x **9.8** ft)



natural fiber layer

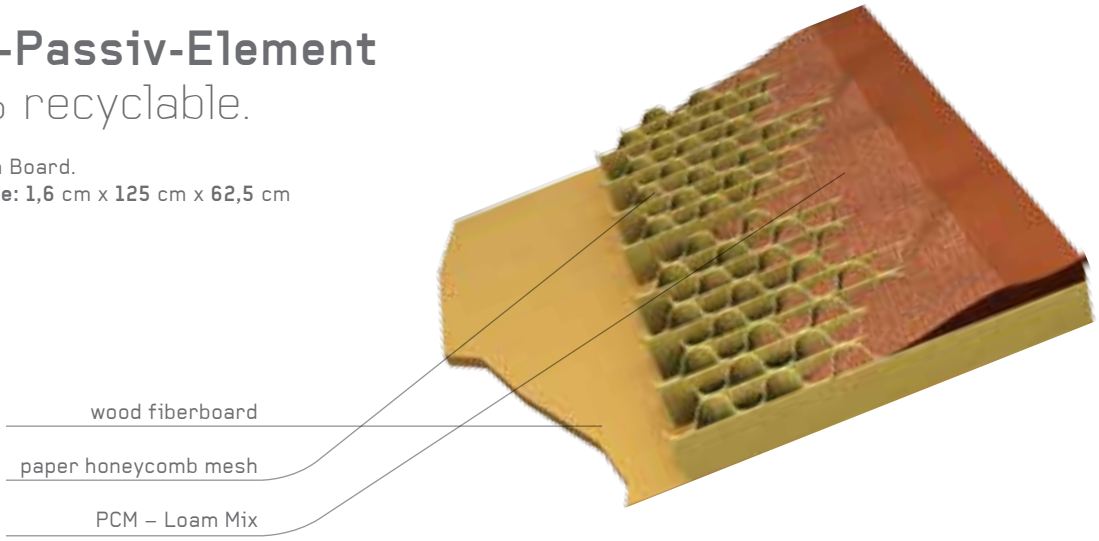
natural fiber honeycomb mesh

PCM – Loam Mix

natural fiber layer

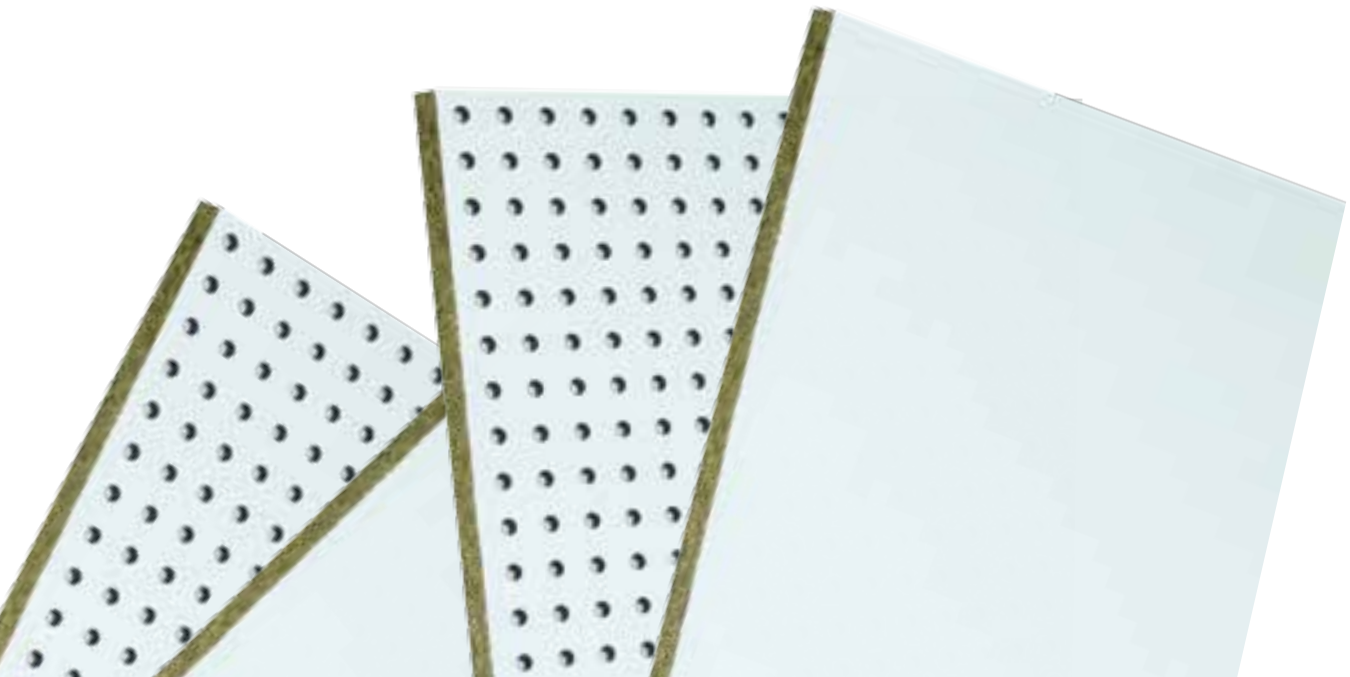
PCM-Passiv-Element
100% recyclable.

PCM Loam Board.
Board size: 1,6 cm x **125** cm x **62,5** cm



PCM-Polymer-Element

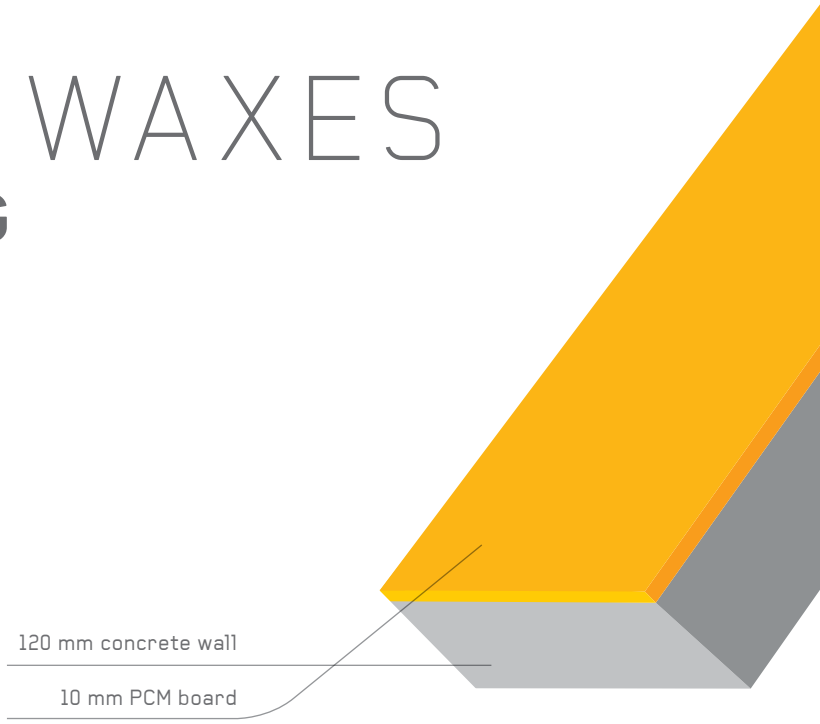
Extrem light-weight PCM element, but delivering a huge amount of thermal mass. If you are interested to learn more about this amazing product, or would like to find out how we might be able to assist you in your developments, please do not hesitate to contact us.



HIGH-TECH WAXES

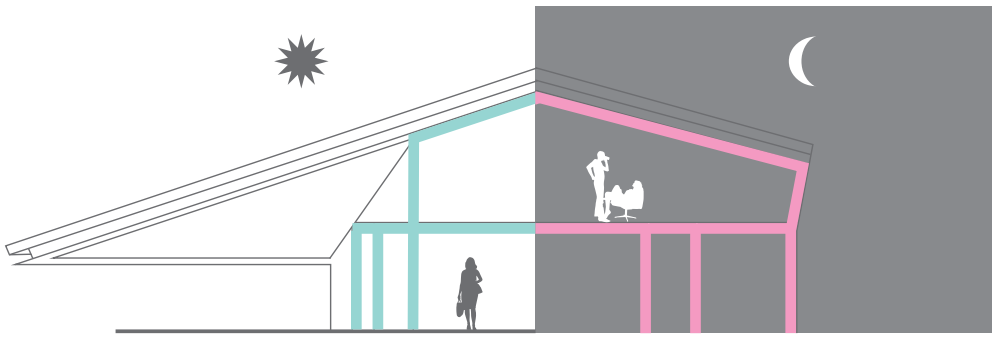
STOP OVERHEATING

AND STORE THE HEAT WITHOUT
WASTING ANY ENERGY



Equivalent building element:
a **10** mm thick PCM board
has the same thermal mass
like a **120** mm concrete wall

Once the room temperature rises the PCM boards absorb the heat and store it „latently“, without getting any warmer themselves. When the room temperature drops again in the night, the PCM boards are „discharged“ and radiat the stored thermal energy, thus keeping the room warm.



PCM boards structural detail showing loam plates & wax spheres

PCM boards do not store electric, but thermal energy. The PCM material is a microencapsulated high-tech wax engineered to switch from solid to liquid (melting point) at **23**, or **26** deg Celsius. Melting the wax requires a large amount of thermal energy which is extracted from the ambient air and stored latently. Once the ambient temperature drops below the PCM melting point the stored heat is release and the boards ready for a new cycle. This process will last for the lifetime of the building.

Operational area:

To counter the lack of thermal mass in existing buildings ++ New build ++ Can be fitted to ceilings and walls ++ Residential and office buildings ++ Museums, Galleries, Cultural sites ++ Schools and nurseries ++ Industrial buildings

Facts:

Climate solution for residential and commercial buildings. Light-weight off site construction, but with a maximum of thermal mass. Ultra light suspendent ceiling elements. Thermal mass offering massive heat storage capacity. Comfortable indoor temperature without energy guzzling HVAC units. Saving energy without sacrificing comfort. Significantly reduced temperature fluctuation. NO maintenance & NO running costs. Absorbing excess heat. Non-toxic materials. Reduces CO2 emissions. Reduces costs.

COOLING AND STORING
A SUCCESSFUL SOLUTION

N° 1 Mobile energy autark construction: „open office“ Internall lining with low-voltage PCM electric heating & storage elements, operated with onsite PV generated electricity **N° 2** During the renovation of London's historic Somerset House more then **1000** m² PCM boards were used to supply a light-weight thermal mass solution and to achieve a BREEAM excellent rating. **N° 3** PCM boards were fitted to achieve a comfortable and stable indoor climate. **N° 4** „Steigerland“ in Amsterdam / Holland: PCM boards absorb excess heat during the day and release the heat when ist gets colder **N° 5** „Eco Hut“ / Switzerland: PCM boards reduce temperature fluctuations and store the excess heat without needing any energy in the process

1
2 3
4
5

REFERENCES 2004 -2014

Wohnhaus Parkstraße Berlin
Geschäftshaus Zürich
Schule Hamburg
Schule Frankfurt
Villa Starnberger See
Somerset House London
Wohnhaus Amsterdam
Kindertagesstätte Ludwigshafen
Wohnung Kremstal
Österreich
Büro Mertert
Luxemburg
Wohnung bei Darmstadt
Ökowohnbox
Dübendorf
Schweiz
Wohnung München
Luxus-Dachgeschoßwohnung
Innenstadt Düsseldorf
Wohnhaus Wien
Privat Villa in Suffolk, England
Apartment Aalborg, Dänemark
Dachwohnung Fehrberlinerstr., Berlin
Wohnprojekt One Church Square, London
Villa Zürich

Speicherhäuser:
Essen
S3, Erfurt
Wohnhaus Burgenland, Österreich
Potsdamer Klimainstitut

Solar Decathlon:
Berlin
Konstanz
London
Berlin

Universitäten:
University of Alster, Belfast
University Nottingham
Universität Ancona
Universität Lyngby, Dänemark

SOLAR DECATHLON

THE GLOBAL COMPETITION FOR UNIVERSITY TEAMS

Solar Decatlon Europe

Back in 2002 the US Government Department for Energy started the „Solar Decathlon“, an international student competition for architects and engineers. Out of a large number of applicants, 20 teams are selected to realize their projects and show how well designed and sustainable they are.

MADRID 2010

LIVINGEQUIA

Team: „Living Equia“, Engineering College, Berlin, Germany

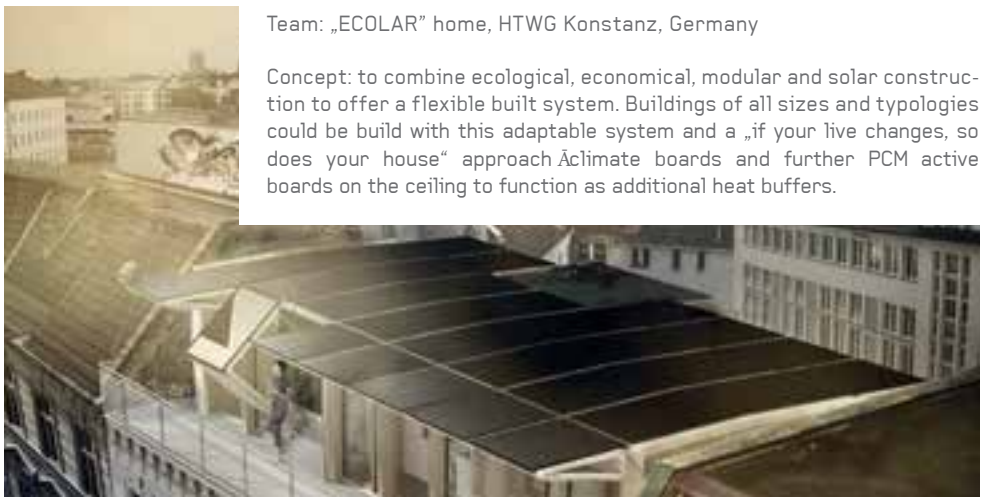
Concept: to develop a new solar architecture, putting factors like sun, light and time back into the center of the daily „living“ experience. To optimize the energy efficiency and to demonstrate innovative technical solutions, water-bearing loam climate boards were fitted on the ceiling and PCM loam boards on all walls.

ecolar

MADRID 2012

Team: „ECOLAR” home, HTWG Konstanz, Germany

Concept: to combine ecological, economical, modular and solar construction to offer a flexible built system. Buildings of all sizes and typologies could be build with this adaptable system and a „if your live changes, so does your house“ approach Ā̆climate boards and further PCM active boards on the ceiling to function as additional heat buffers.



HelioMet
a brighter future

CHINA 2013

Team: „Heliomet”, London Metropolitan University, UK

Concept: extremly light and compact elements cut from plant oil based dense foam material, being both structuall elements and thermal insulation boards, but only offering very little thermal mass. . paper honeycomb mesh was laminated to all internal surfaces and filled with a PCM loam mix to supply sufficient thermal mass.

VERSAILLES 2014

ROOFTOP

Team: „rooftop” Art & Design School and Technical University Berlin, Germany

Concept: a modular pre-fab construction element to replace unused loft space. Being extremly energy efficient and fitted with PV elements, more electricity is generated then consumed. The surplus is not feed into the national grid, but exported to other flats in the building. A successful energy concept was realized with the help of PCM elements. To minimize the use of the onsite generated electricity, the comfortable room temperature was achieved with passive and active PCM elements fitted at the ceiling and walls.

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