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# EXPERT KLIMA

Thermal insulation system



PLEASANT INDOOR ENVIRONMENT PRACTICAL SPACE GAIN HIGH ENERGY SAVING SUSTAINABLE MOULD PROTECTION



## SAVES ENERGY. PREVENTS MOULD. REGULATES INTERNAL ENVIRONMENT.

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# MAXIMUM LIVING COMFORT AND HIGH ENERGY EFFICIENCY

Warm wall surfaces thanks to effective thermal insulation offer numerous advantages

In a new building or the renovation of an old building, creating a comfortable living environment takes priority. Whether it is cold draughts in winter or stifling heat in summer, those living in poorly insulated buildings are confronted with many consequences that can have an enormous impact on their quality of life as well as endanger their health.

The disadvantages of poor thermal insulation become particularly apparent with cold outside temperatures: a large part of the heat stored in the building is lost through the outer walls. However, in order to achieve a comfortable room temperature of about 19 - 20 °C, the heating cost is expensive. This is why it is particularly important to reduce the heat transfer through the building envelope by means of thermal insulation. An effective thermal insulation system guarantees warm wall surfaces (maximum temperature difference to room temperature of about 3 - 4 °C), increasing living comfort and offering a number of other advantages.

## **PLEASANT ROOM ENVIRONMENT**

The indoor environment defines the quality of living. Various parameters have an influence on the atmosphere of a room. Humidity should be between 40 and 60 percent, because a value below 30 percent can lead to breathing problems. Depending on the use of the room, a temperature between 18 °C and 22 °C is ideal. In addition, the vertical air



HEAT LOSSES AND COLD DRAFTS DUE TO UNINSULATED OUTER WALL

temperature between the foot and head area should be almost identical. These properties can be achieved with effective thermal insulation, which ensures a constant and pleasant room environment and thus a real feel-good atmosphere.







UNINSULATED OUTER WALL



ON THE INSIDE INSULATED OUTER WALL

## **PRACTICAL SPACE GAIN**

Even in a heated room, a kind of cold draught is often noticeable. The reason: the surrounding wall surfaces radiate cold into the room, which prevents comfortable living and working close to the wall. Seats are intuitively positioned towards the centre of the room.

This means that usable space gets lost. With the right thermal insulation system, cold radiation can be avoided. Insulation on the interior walls ensures that the surfaces heat up and the heat remains in the room.

## **HIGH ENERGY SAVING**

Older buildings especially with no or poor thermal insulation, release large amounts of heat through the outer building envelope. Many owners are not aware of the constant heat loss.

Only an analysis by infrared thermography can clarify the thermal weak points in the house. These are located wherever the warm air inside and the cold outside air are separated: in the roof area, on the façade, in the cellar as well as any windows and doors.

## HOW MUCH CAN INSULATION SAVE?

The payback on the initial investment in thermal insulation varies from building to building and depends on a variety of factors, e.g. construction type, energy price development and refurbishment costs. After a detailed analysis, an independent energy consultant can determine the potential savings.

## The rule of thumb is:

The older the building, the higher the savings potential.

## **EXPERT** BOX



## USING ENERGY SAVING POTENTIAL

Owners should check their house for energy-saving potential and carry out effective thermal insulation measures. The main focus should be on the insulation of the façade either from the outside or from the inside. This measure can reduce heating costs by up to 19%.

Compared to a renewal of the windows, a simple cellar or roof insulation, this has the clearest effect on the energy balance and thus positively on the purse. With the expected increases in energy prices, it is therefore advisable to invest in effective thermal insulation.

Data source for figures: Scottish Government http://www.gov.scot/Publications/2009/03/20155542/4



## SUSTAINABLE MOULD PROTECTION

## HOW DOES MOULD DEVELOP?

There's no mould in the desert. Mould develops where it is damp. It particularly likes to spread where moist air is deposited on cold surfaces. This does not even require condensation to form. It is sufficient if the relative humidity on the surface exceeds 80%.

So-called thermal bridges are particularly at risk. These are building components through which the heat is transported to the outside faster than through other parts of the structure. For example, the corners of buildings, window reveals, roller shutter boxes or balconies are susceptible.

With the installation of new, draft-proof windows, there is often increased mould growth. Previously, air was exchanged through leaks in the building envelope or through the joints in the windows. However, a lot of energy was wasted. The installation of tight windows significantly reduces these energy losses. But if the ventilation behaviour remains unchanged, an increase in relative humidity and thus the risk of mould growth is the result.

Structural damage such as broken pipes, leaking roofs or inadequate insulation can cause damp walls and thus mould. Only a professional renovation can help here.

Also, the correct user behaviour with regular airing and planned heating in the winter months is a must: with low air humidity and appropriate room temperature mould fungi have almost no chance. In a 3-person household, upto twelve litres of water are produced per day by showering, cooking, tumble-drying and normal breathing air. If this moisture cannot escape from the air, it condenses in the coldest part of the room. The formation of mould is pre-programmed.



## TIPS AGAINST MOULD GROWTH DUE TO MOISTURE IN THE HOUSEHOLD:

- Regular shock ventilation, three to four times a day for at least five minutes (windows continuously in tilt position should be avoided)
- ▶ Planned heating (bedroom 16 °C, living rooms 20 °C, bathroom 21 °C)
- \* Varies according to species and number of plants
- Data per sqm per hour Varies according to ambient conditions

Data source for figures: Guide to the prevention, detection and remediation of mould infestation in buildings, Federal Environment Agency UBA



Mould spores enter the respiratory tract via the air in the room and can be particularly dangerous for children, the elderly or people with weak immune systems or respiratory diseases. Symptoms such as allergic reactions, cold, severe cough, headaches, burning eyes and even sleep disturbances can be the result. If mould is already present on the wall surfaces, extensive remediation measures are absolutely necessary.

### POORLY INSULATED ENTAILS THE RISK OF MOULD GROWTH

Mould can not only lead to a serious threat to the structure of the building, but also to negative health consequences for the occupants. A variety of moulds can be found in a building. In order for mould spores to germinate, however, sufficient moisture must be available. Fungal damage does not occur on a really dry substrate. Therefore, avoid condensation! But where is the limit? At 50 % relative humidity (R.H.) and 20 °C air temperature (see diagram) the minimum permissible surface temperature for the safe avoidance of mould growth on surfaces is 12.6 °C.

#### You can find more information in following brochure:

World Health Organization (WHO) 2009: DAMP AND MOULD – Health risks, prevention and remedial actions – Information brochure: "In Europe, an estimated 10 – 50% (depending on the country) of the indoor environments where human beings live, work and play



the indoor environments where human beings live, work and play **CONTRACTOR** are damp. Too much moisture makes a home stuffy and gives it a faint odour. Humid walls create a coldness that makes more heating necessary and increases energy bills. **WHO is concerned about this**."

#### Relative humidity on the surface 100 % 9.3 °C 95 % 90 % 85 % 80 % 75 % 70 % 65 % 60 % 55 % 50 % 6°C 8°C 10°C 12 °C 14 °C 16 °C 18 °C 70 °C 4 °C Temperature on the surface



## HOW CAN MOULD BE COMBATED AND REMOVED?

First of all, the cause for the occurrence of mould, e.g. poor insulation, damp masonry, building faults during construction, water pipe breakages or incorrect ventilation and heating behaviour must be identified and rectified.

Surface mildew stains up to approx. 0.5 m<sup>2</sup> can be dabbed off with methylated spirit or 70 to 80 % ethyl alcohol. Wear plastic gloves and a mouthguard. Aggressive chemical agents should not be used, as many of these "chemical solutions" are considered harmful to health. Infested wallpaper, plasterboard or wooden parts must be disposed of. Heavy and extensive mould infestation is always a task for the specialist.

## SUSTAINABLE MOULD PROTECTION

After the mould remediation, the installation of a moderate internal insulation ensures that the surface temperature of the external wall rises and that neither condensate nor mould can form as a result.

# THICK MASONRY DOES NOT PROTECT AGAINST MOULD

The advantages of a slim interior insulation system compared to higher masonry thicknesses

A thick masonry wall keeps the house/apartment warm in winter – this is a typical misconception and at the same time a frequent argument as to why refurbishment measures can't be started in the first place. The following example explains why higher wall thicknesses do not guarantee better thermal insulation:

The outside temperature is 0 °C in winter with an air humidity of 80 %. The interior temperature, on the other hand, is a pleasant 20 °C with an air humidity of 50 %. In this scenario, the temperature on the inside of a 24.0 cm wall is approx. 11.7 °C. There is a risk of condensation and mould on the inner wall surface. A 30.0 cm thick wall reaches a surface temperature of only 12.6 °C at these cold outside temperatures. With a 6.0 cm thicker wall, the surface temperature is only increased by 0.9 °C. The thermal insulation effect of a thicker wall is therefore very low. The condensate can cause mould, which can cause lasting damage to the building fabric.

An efficient thermal insulation system such as EXPERT KLIMA prevents the formation of mould. With an insulation layer of only 4.0 cm, the wall surface temperature is increased by 4.8 °C. This removes the basis for mould growth and the masonry remains dry. **The result: maximum living comfort and a pleasant feel-good environment in the room.** 

## THE PROOF: THIN INSULATION. GREAT EFFECT.



### 24.0 CM MASONRY - WITHOUT INSULATION

With 24.0 cm thick uninsulated masonry (Lambda = 0.8 W/mK) and outside temperatures of 0 °C in winter, the wall surface temperature in the interior is approx. 11.7 °C.

In addition to the enormous loss of energy, there is the danger of the formation of condensate and thus also mould on the inner wall surface.



#### **30.0 CM MASONRY - WITHOUT INSULATION**

An uninsulated masonry with a thickness of 30.0 cm leads to wall surface temperature of about 12.6 °C.

The calculation is simple: 6.0 cm more masonry lead to a temperature rise of just 0.9 °C. This is the clear proof: thicker masonry costs money as well as usable space and does not necessarily protect against mould.



#### 24.0 CM MASONRY + 4.0 CM INSULATION

Masonry with a cross section of 24.0 cm, on which a 4.0 cm thick insulation system is applied (Lambda = 0.05 W/mK), ensures a wall surface temperature of a pleasant 16.5 °C.

The danger of condensation is eliminated and the usable space is only marginally reduced.



## **EXPERT** BOX

#### LITTLE BRINGS MUCH: GREATEST INSULATION EFFECT UP TO 4.0 CM MATERIAL THICKNESS

The comparison clearly shows: the effectiveness of the insulation decreases with increasing material thickness. An increase in the insulation layer would cost too much usable space during renovation or in new construction and is therefore not practicable.

Choosing the right insulation thickness is a delicate balance. With increasing thickness, the temperature of the existing wall will fall as well as its drying potential. The optimum balance between a sufficient surface temperature to prevent the mould risk and a sufficient drying potential for the existing wall is the goal of every renovation.



# REDUCING HEAT LOSSES AND MAN-AGING MOISTURE

Airtight constructions - optimal with diffusion-open insulation

In many older building constructions, cold outside air penetrates inside through gaps, joints or faulty connections and warm room air escapes outside. In order to lose as little high-cost heat as possible through the façade, today's buildings are therefore constructed to be "airtight".



The term "airtight" is used whenever a building or building material cannot be penetrated by air from the inside or outside. Building materials, such as metals or foils, are naturally airtight. In the case of a brick wall, this is only the case if at least one side has been plastered over its entire surface. But ATTENTION: while a metal or foil is often diffusion-tight at the same time, the brick wall (whether unplastered or plastered) is permeable, i.e. (water) vapour can be transported through the wall. This property has long been described as "the wall can breathe", but it refers to the building physics process of water vapour diffusion.

## WHAT HAPPENS TO AN AIRTIGHT, BREATHABLE (BRICK) WALL THAT IS INSULATED FROM THE INSIDE?

Here it is necessary to look at the situation in the construction in winter. Because in the cold season there is a high vapour pressure gradient from the inside of the building to the outside. The difference in temperature and vapour pressure between inside and outside provides a heat and vapour flow from inside to outside. The warm, humid air (water vapour) inside the building wants to go outside. If the water vapour falls below the dew point on its way out, it will condense – i. e. become liquid. Where this point will lie is very easy to say across the board. The installation of internal insulation creates a large temperature gradient within the insulation. The water vapour will condense on the cold side of the insulation. There are different solutions for dealing with this "moisture" topic in interior insulation. A modern, capillary-active interior insulation for example absorbs this moisture, transports it to drier zones and keeps the building dry and warm.

## **BY THE WAY:**

Another side effect of interior insulation can be observed on page 11 of the brochure. The greater the insulation thickness, the lower the temperature of the existing wall and thus its drying potential.



## CHOOSING THE RIGHT INTERNAL INSULATION SYSTEM

When using internal insulation systems, particular attention must be paid to moisture management. It is important that the moisture content of the wall does not increase over time. Considering that some insulation materials can handle moisture (for example: Expert Klima) while others may not be dampened under any circumstances, two different approaches exist: diffusion-tight (partly also diffusion-inhibiting) and diffusion-open, capillary-active interior insulation systems.

Which of these systems is better suited for a new building or renovation project depends on the individual building situation. However, a capillary-active insulation system is always the best choice in terms of mould prevention and indoor comfort, as it naturally regulates humidity.

## DIFFUSION TIGHT/HAMPERED INTERIOR INSULATION SYSTEMS

The basic principle of this type of systems is to prevent the penetration of moisture from the room side into the insulation material by means of suitable materials and constructions. For this purpose, a layer with a high diffusion resistance is applied to the insulation layer (e.g.: mineral wool) on the room side. This layer can consist of the insulating material itself (e.g.: foam glass) or of a vapour retardant film. If the interior insulation is mounted on a wall that is not plastered, the vapour barrier will also serve as the layer for air-tightness. Finally, in most cases a plasterboard is installed, which assumes a protective function against mechanical damage to the vapour barrier.



#### DIFFUSION-TIGHT AND DIFFUSION-HAMPERED SYSTEMS

Due to the vapour barrier, the wall cannot contribute to buffering moisture peaks in the internal environment, which leads to increased relative humidity at peak times or inevitably requires a ventilation system. Furthermore, the vapour barrier also prevents the existing structure from drying out to the inside, as is particularly necessary for facing brickwork or half-timbered constructions and in regions with heavy driving rain.

- No moisture regulation
- Low drying potential of the wall
- Great care in planning is required
- Difficult installation
- All vapour barrier joints and all connections (windows, floor, ceiling) must be airtight
- All breakthroughs (pipelines, sockets, etc.) must be airtight
- Susceptible to damage, even a nail in the wall can impair the water vapour barrier

## DIFFUSION-OPEN CAPILLARY-ACTIVE INTERIOR INSULATION – THIS IS HOW EXPERT KLIMA WORKS!

Expert Klima allows vapour diffusion into the wall, absorbs the accumulated moisture and transports it by capillary action towards the interior surface of the wall. This permanently reduces the moisture level in the wall to a safe level. In addition, the wall remains diffusion-open and can buffer humidity peaks from the room air. Thus, the relative humidity in the room is naturally regulated. A ventilation system will not be needed. The construction is airtight, but open to vapour diffusion and thus has a high drying potential. Depending on the climatic conditions the masonry wall can dry to the inside as well as to the outside.



#### **CAPILLARY-ACTIVE AND DIFFUSION-OPEN SYSTEM WITH SITEK**

The construction is airtight, but open to vapour diffusion and thus has a high drying potential. The wall can dry to the inside as well as to the outside.

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- Natural regulation of indoor humidity
- + Good drying potential within the masonry
- No ventilation system necessary
- No risk of mould
- Comfortable room climate
- Effective even with thin insulation layer
- + Simple installation, no vapour barrier required



# EXPERT KLIMA INSULATION SYSTEM

Clever solution for natural interior insulation

Expert Klima offers maximum thermal insulation and, thanks to its capillary-active properties, regulates moisture in the interior. The development of mould is thus prevented right from the start. From the insulation board Expert Klima in thicknesses 25 or 40 mm to the Reveal Board for Expert Klima and Insulation Wedge for Expert Klima – the integrated system offers the right solution for every application and consists of 100 % natural and environmentally friendly materials.

## **EXPERT KLIMA**

Capillary-active thermal insulation board for sustainable mould protection

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## **EXPERT KLIMA BOARD 25 / 40**

A capillary-active thermal insulation board, consisting of expanded perlite, binders and fibres for the insulation and mould remediation of walls and ceilings.

The "Expert Klima" interior insulation board eliminates condensation problems, e.g. as a result of thermal bridges or in the case of poorly insulated exterior walls, and thus serves the purpose of sustainable mould prevention. The balanced moisture management due to the high capillarity and the excellent drying behaviour of the board and its insulating properties also create a pleasant and healthy room environment.

## **CERTIFICATES AND TESTS**

- ▶ CE-marking: Certificate N° 1163-CPR-499
- Expert Klima meets the requirements of EN 13169
- ▶ The production is covered by ISO 9001, ISO 14001 and ISO50001 certification
- Certified by RAL UZ 132 (Blue Angel): No Contract 36561
- Certified by Micor Institut: No Certificate 07042017-1 (resistant to mould growth)
- ▶ R value according to AFSSET 0,40 \*\*
- ▶ Emissions to indoor air: A+ \*\*\*







### **ADVANTAGES**

- ▶ Permeable, moisture-regulating and capillary-active
- Condensation is rapidly absorbed and redistributed
- Humidity peaks in the room air are buffered
- No water vapour barrier is required
- Resistant to mould growth
- ▶ High stability with low board weight
- Easy and fast to install
- Ecological and recyclable

CHARACTERISTICS*	VALUE	UNIT	STANDARD
Length, width	1,200 × 600	mm	EN 822
Thickness	25 or 40	mm	EN 823
Declared thermal conductivity, <sub>D</sub>	0.050	W/mK	EN 13169
Nominal density	150	kg/m³	EN 1602
Reaction to fire classification (Euro class)	B-s1, d0		EN 13501-1
Porosity	≥94	Vol.%	
Water vapour diffusion resistance $\mu_{\text{DRY}}$	6	[-]	EN ISO 12572****
Water absorption coefficient Aw	approx. 61 approx. 1.0	kg/(m² h <sup>0.5</sup> ) kg/(m² s <sup>0.5</sup> )	EN ISO 15148
Compressive strength at 10 % deformation	0.25	N/mm <sup>2</sup>	EN 826
Bending strength	0.35	N/mm <sup>2</sup>	EN 12089
Tensile strength	0.07	N/mm <sup>2</sup>	EN 1607

PACKAGING - EXPERT KLIMA BOARD 25 / 40							
Dimensions	Boards / Packet	Packets / Pallet	Boards / Pallet	Board	Packet	Pallet	
1,200 × 600 × 25 mm	10 pcs.	16 pcs.	160 pcs.	0.72 m <sup>2</sup> (0.018 m <sup>3</sup> )	7.20 m <sup>2</sup> (0,18 m <sup>3</sup> )	115.20 m <sup>2</sup> (2.88 m <sup>3</sup> )	
1,200 × 600 × 40 mm	6 pcs.	18 pcs.	108 pcs.	0.72 m <sup>2</sup> (0.029 m <sup>3</sup> )	4.32 m <sup>2</sup> (0,17 m <sup>3</sup> )	77.76 m <sup>2</sup> (3.11 m <sup>3</sup> )	

The characteristics of our products are subject to normal manufacturing variations and can be changed without prior notice. Check with your Sitek office for current information.

## **INSULATION WEDGE FOR EXPERT KLIMA**

Capillary-active thermal insulation wedge, consisting of expanded perlite, binders and fibres. Specially developed for the insulation and mould remediation of thermal bridges on walls and ceilings.

The "Insulation Wedge for Expert Klima" eliminates condensation problems, e.g. as a result of thermal bridges or in the case of poorly insulated ceilings and exterior walls, and thus serves the purpose of sustainable mould prevention. The balanced moisture management due to the high capillarity and the excellent drying behaviour of the board and its insulating properties also create a pleasant and healthy room climate.

### ADVANTAGES

- Permeable
- ▶ No water vapour barrier, capillary-active
- Moisture is rapidly absorbed and redistributed
- High stability with low board weight
- Easy and fast to install
- Ecological and recyclable





High heat losses through wall and ceiling junctions.

Insulated with 4 cm Expert Klima and with the "Insulation Wedge for Expert Klima".

Frame parameters: Inside: 20 °C, Rsi = 0,25 m<sup>2</sup>K/W • Outside: -5 °C, Rse = 0,04 m<sup>2</sup>K/W • Outer wall: 24 cm masonry (Lambda = 0.08 W/mK), both sides plastered • Inner wall: 11.5 cm masonry At 20 °C and 50 % relative humidity, cooling down to 12.6 °C results in 80 % humidity, which is generally used as a limit for mould growth

## EXPERT BOX

#### INSULATED OUTER WALL WITH NON INSULATED INNER WALL OR CEILING JUNCTIONS

When installing internal insulation, insulation at the junctions to inner walls or ceilings is often dispensed with. Since thermal bridges with increased heat flux are located exactly at these points, the result is that the surface temperatures drop – and often to an even lower level than with the non-insulated wall.

V. Marincioni, N. May and H. Altamirano-Medina stated in the "Parametric Study on the Impact of Thermal Bridges on the Heat Loss of Internally Insulated Buildings": "Insulating the junctions can be a more appropriate solution than increasing the insulation thickness or reducing its thermal conductivity."

This is why the Insulation Wedge for Expert Klima is indispensable for sustainable thermal insulation.





CHARACTERISTICS*	VALUE	UNIT	STANDARD
Length, width	380 × 580	mm	EN 822
Thickness	8/30	mm	EN 823
Declared thermal conductivity, <sub>D</sub>	0.050	W/mK	EN 13169
Nominal density	150	kg/m³	EN 1602
Reaction to fire classification (Euro class)	B-s1, d0		EN 13501-1
Porosity	≥94	Vol.%	
Water vapour diffusion resistance $\mu_{DRY}$	6	[-]	EN ISO 12572**
Water absorption coefficient Aw	approx. 61 approx. 1.0	kg/(m <sup>2</sup> h <sup>0.5</sup> ) kg/(m <sup>2</sup> s <sup>0.5</sup> )	EN ISO 15148
Compressive strength at 10 % deformation	0.25	N/mm <sup>2</sup>	EN 826
Bending strength	0.35	N/mm <sup>2</sup>	EN 12089
Tensile strength	0.07	N/mm <sup>2</sup>	EN 1607

PACKAGING - INSULATION WEDGE FOR EXPERT KLIMA							
Dimensions	Wedges / Carton	Cartons / Pallet	Wedges / Pallet	Wedge	Carton	Pallet	
580 × 380 × 8/30 mm	12 pcs.	42 pcs.	504 pcs.	0.22 m <sup>2</sup> (0.004 m <sup>3</sup> )	2.64 m <sup>2</sup> (0.05 m <sup>3</sup> )	111.08 m <sup>2</sup> (2.11 m <sup>3</sup> )	

\* The characteristics of our products are subject to normal manufacturing variations and can be changed without prior notice. Check with your Sitek office for current information.

\*\* Based on

## **REVEAL BOARD FOR EXPERT KLIMA**

Capillary-active reveal board, consisting of expanded perlite, binders and fibres. Specially developed for the insulation and mould remediation of thermal bridges on windows and doors.

The "Reveal Board for Expert Klima" eliminates condensation problems, e.g. as a result of thermal bridges or in the case of poorly insulated window and door reveals, and thus serves the purpose of sustainable mould prevention. The balanced moisture management due to the high capillarity and the excellent drying behaviour of the board and its insulating properties also create a pleasant and healthy room environment.

## ADVANTAGES

- Permeable
- Without water vapour barrier, capillary-active
- Moisture is rapidly absorbed and redistributed
- High stability with low board weight
- Easy and fast to install
- Ecological and recyclable





The verifications are based on EN ISO 10211 and EN ISO 13788. Frame parameters: Inside: 20 °C, Rsi = 0,25 m<sup>2</sup> K/W • Outside: -5 °C, Rse = 0,04 m<sup>2</sup> K/W • Outer wall: 24 cm masonry (Lambda = 0.08 W/mK), both sides plastered • Inner wall: 11.5 cm masonry At 20 °C and 50 % relative humidity, cooling down to 12.6 °C results in 80 % humidity, which is generally used as a limit for mould growth.



## **EXPERT** BOX

## INSULATED WALL WITH A NON-INSULATED WINDOW REVEAL

Window reveals are one of the most critical areas of a building. In wintry weather conditions, the surface temperature is often the lowest here. Without the use of a reveal board, dangerous thermal bridges are created.

Further to be considered: The thicker the existing wall or the thicker the applied interior insulation, the higher the heat loss at this point and the greater the problem.

This is why the Reveal Board is an integral part of the Expert Klima System.



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CHARACTERISTICS*	VALUE	UNIT	STANDARD
Length, width	380 × 580	mm	EN 822
Thickness	15	mm	EN 823
Declared thermal conductivity, D	0.060	W/mK	EN 13169
Nominal density	210	kg/m³	EN 1602
Reaction to fire classification (Euro class)	n.d.		EN 13501-1
Water vapour diffusion resistance µ	5	[-]	EN ISO 10456
Compressive strength at 10 % deformation	0.3	N/mm <sup>2</sup>	EN 826
Bending strength	0.8	N/mm <sup>2</sup>	EN 12089
Tensile strength	0.08	N/mm <sup>2</sup>	EN 1607

PACKAGING - REVEAL BOARD FOR EXPERT KLIMA							
Dimensions	Boards / Carton	Cartons / Pallet	Boards / Pallet	Board	Carton	Pallet	
580 × 380 × 15 mm	16 pcs.	42 pcs.	672 pcs.	0.22 m <sup>2</sup> (0.003 m <sup>3</sup> )	$3.53 \text{ m}^2 (0.053 \text{ m}^3)$	148.11 m <sup>2</sup> (2.22 m <sup>3</sup> )	

# INSTALLATION INSTRUCTIONS

Expert Klima application – Step by Step

## 01. Checking the substrate

The substrate must be load-bearing, dry, dust-free, free of efflorescence and incompatible coatings, i. e. old damaged plaster, paint and old wallpaper. Mould must be removed. Chalky surfaces must be primed. Existing uneven layers of plaster must be levelled if necessary. In the case of rising damp, façades that are not resistant to driving rain or brickwork that is loaded with salt, a renovation must be carried out first.

## 02. Plaster – the air-tightness layer

In order to ensure the air-tightness of the overall construction, a plaster layer must always be present on the inside of the existing wall. If a plaster already exists: see step 1 and then 3. For exposed brickwork, a mineral plaster based on clay or lime (not moisture-sensitive, gypsum-based plasters) must always be applied first.

## 03. Preparatory work

Before the first insulation boards are installed, a decoupling strip is applied to all contacting surfaces such as floors, ceilings and walls, which simultaneously prevents air from escaping.

## 04. Cut Expert Klima in proper dimension

Depending on the board thickness, cutting can be carried out with a cutter, a fine-toothed foxtail saw or an immersion saw (optimally with suction).

## 05. Apply mortar to Expert Klima

Ideally, diffusion-open, non-water-repellent lime or clay plasters should be used as adhesive mortar. They must always be applied onto the back side (non-marked, darker side) of the board and combed with a tooth comb (minimum  $8 \times 8$  mm). Important: The boards must always be glued over the entire surface (no point-bead bonding!).

## 06. Install Expert Klima

The boards are pressed against the wall and pushed into place. Cross joints must be avoided. Board butt joints must not lie over the corner points of openings.



## ▶ FOR FURTHER PROCESSING ON EXPERT KLIMA PLEASE SEE PAGE 26 AND 27.



## FURTHER PROCESSING ON EXPERT KLIMA

## **FINISHING THE SURFACE**

Expert Klima can be finished in three different ways, depending on the desired surface (plaster or gypsum board), the scope of the planned technical building equipment and the building fabric.

## 01. Plaster coating

This solution is the thinnest and most space-saving variant. If a plaster surface is desired, the best choice should be lime or clay plasters, which are known for their good moisture absorption and, together with Expert Klima, ensure a healthy living climate. A reinforcement mesh must be provided in the plaster layer. Appealing surfaces and colour design are then created with colours matched to the plaster, e.g. lime paint. Vapour permeable wallpapers can also be used.

## 02. Directly glued gypsum board

The plasterboard is glued directly to Expert Klima with adhesive patches. This variant also has a very slim structure, which is ideally suited to level out unevenness in the wall. Without dowelling, this solution should be used with the handy, room-high one-man panel only for wall heights up to 2.60 m. In the case of extremely slender wall structures and/or energetically poor external walls, a sufficiently high temperature on the surface of the Expert Klima must be ensured.

## **GENERAL INFORMATION:**

Attention must be paid to water-bearing pipes in the wall. With high insulation thicknesses or energetically poor external walls, they can be at risk of frost in winter after installation of the interior insulation.

Information on the type, extent and installation of the plaster, the substructures and the gypsum plasterboards as well as on the finishing of the surfaces can be found in the documentation of the respective plaster or gypsum plasterboard manufacturer.

## 03. Gypsum board and metal subconstruction

A metal or wooden support frame is placed in front of the "Expert Klima" with the aid of profiles attached to the floor and ceiling. Alternatively, the frame can also be fixed to the wall with thermally separated fasteners that pass through Expert Klima. The plasterboard is then applied to the frame. In the case of extremely slender wall structures and/or energetically poor external walls, a sufficiently high temperature on the surface of the Expert Klima must be ensured. This construction requires more space but is very advantageous on uneven surfaces or if a new electrical or heating installation is to be carried out.







# ECOLOGICALLY RESPONSIBLE

Expert Klima equally improves living quality and the environment

Saving energy, limiting atmospheric and soil pollution, recycling product waste have become more and more important issues in ensuring sustainable development. A widely recognised advantage of thermal insulation materials is their ability to decrease the energy required for the heating of buildings which conserves energy and contributes to the reduction of  $CO_2$  emissions. Materials should consist of appropriate substances and they should be installed in such a way so as not to harm people, animals or plants but rather protect them and provide a safe and healthy environment in which to live. The balance between the advantages of the products and their methods of production on the one hand, and their application and ease of replacement or disposal on the other, should be globally positive.

Expert Klima meets such requirements. It consists mainly of perlite, binders and fibres.

# EXPANDED PERLITE INSULATION

## Ecologically sustainable from the beginning of the value chain

## **EXPERT KLIMA - INSULATION IN A NATURAL WAY**

Expert Klima consists mainly of expanded perlite, binders and fibres which, in turn, have been produced from recycled material, thus avoiding the use of land-fill disposal sites. The board is chemically neutral, not dangerous, nor does it present a pollution risk from radiation, smoke or dust emissions. Moreover, thanks to its composition, method of production and its physical properties, Expert Klima has additional advantages with regard to the Environment which are developed in the following pages.

## **PERLITE - A NATURAL PRODUCT**

Perlite rock is a naturally occurring raw material formed on cooling when molten magma comes into contact with water. It is available in large deposits around the world and the open-cast mining (consisting of extraction, crushing and calibration of the rock) is an environmentally friendly mining method. Resources are more than sufficient in relation to requirements.

## After being crushed and then expanded,

perlite has the following characteristics:

- Incombustibility
- Thermally insulating
- Chemically neutral
- Rot proof

## Expanded perlite is used principally for:

- The filtration of liquids (water, wine, beer, etc.)
- Thermal insulation for the building industry
- ▶ Horticulture



## AN ECOLOGICAL MANUFACTURING PROCESS

The Sitek factory in Wissembourg (F) has been awarded the "Prix Technologie Propre" by the French Environment Ministry. This award recognises the work undertaken to obtain a clean production process, for the reduction of energy consumption and the use of recycled raw materials. Many hundreds of tons of cellulose fibre are recovered every year from recycled paper pulping and without the use of any chemicals. Mineral fibers and the expanded perlite are added to the cellulose fibres to obtain a rigid, compression resistant insulation board after drying.



## A significant part of the raw materials used in production comes from by-products from external production processes:

- Cellulose fibres from recycled paper
- Mineral fibres from off-cuts and waste during fibre production

Recycling fibres reduces the quantity of waste produced by the mineral fibre and paper industries and helps to avoid using cellulose fibre from wood.

## **ENVIRONMENT PROTECTION**

The principal ways in which the factory meets its targets for the environment are:

## In-house energy production

Two gas turbines provide the factory with most of its requirements for electricity. With an efficiency between 80% and 95% the optimisation of energy is clearly demonstrated.

## **Recycling of thermal energy**

The specially designed heat exchangers provide an optimisation of energy recycling, contributing to a decrease in consumption.

## 100 % recyclable

Rejects and off-cuts produced during fabrication are recycled 100 % in the production process.

## **EXPERT KLIMA - BECAUSE OUR ENVIRONMENT MATTERS**

The protection of the environment is a constant concern in the production, application, elimination and recycling of boards. The Perlite boards from Sitek are tried and tested, officially approved and quality-controlled construction materials that have been used for over fifty years in buildings where not only thermal and acoustic insulation is required, but also where the protection of the environment is an important consideration. Expanded perlite insulation can be integrated into a strategy of sustainable development with the aim of reducing the impact of society on the environment.

Environmentally-friendly insulation should not be judged solely on thermal performance but also on ecological criteria, e.g.

- Available resources of raw materials
- The requirements of the manufacturing process
- ► Health considerations
- Ease of recyclingDurability



#### RESISTANCE TO MOULD

The MICOR company for microbial processes and materials science GmbH (Rostock, Germany) was commissioned by Sitek to investigate the mould resistance of the Expert Klima according to EAD 040138-00-1201 for loose organic insulating materials in process A and B and to evaluate the results according to DIN EN ISO 846 Table 4.

In the case of a mould population, applied both by method A and B, neither material degradation nor an ingrowth into deeper material layers or structural changes could be observed. Thus, mould resistance was confirmed for the Expert Klima insulation board. The results are summarized in the test report 20170407-1 of the MICOR GmbH.

## CLASS A+

Expert Klima also meets the requirements of class A+ of the decree N° 2011-321 from March 25th, 2011 (VOC regulation) of the French Ministry of Ecology on Sustainable Development, Transport and Housing, which gives information on the level of emission of volatile substances in indoor air with a risk of inhalation toxicity on a class scale ranging from A+ (very low emissions) to C (high emissions).

#### **CAPILLARY WATER ABSORPTION**

Expert Klima is a capillary-active insulation material, which has been tested by the German "Institut für Bauklimatik", Dresden University of Technology. It was especially developed for the insulation of exterior walls from the internal side.



www.blauer-engel.de/uz132

#### **BLUE ANGEL**

Expert Klima has also achieved the Blue Angel eco-label according to RAL-UZ 132 for "Low-emission thermal insulation material and suspended ceilings for use in buildings", which is awarded to products which – beyond the legal provisions – are manufactured by using environmentally less harmful substances and materials, from the health point of view do not have an adverse impact on the living environment and do not contain any hazardous substances that might impede waste disposal.

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