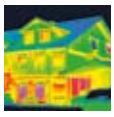
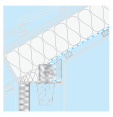
pro clima System
Interior insulation

INTELLO®



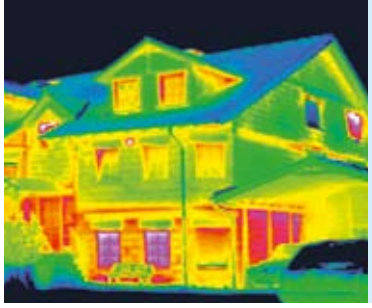




Contents

Peace of mind with the pro clima system guarantee!

... and you're perfectly insulated

pro clima®
intelligent systems



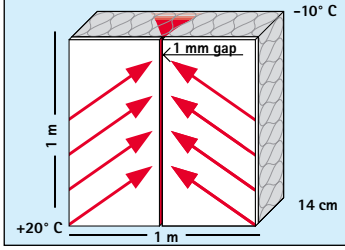
Airtightness – the crucial factor for effective thermal insulation

pro clima®

Even tiny leaks in the vapour check layer, for example due to poor adhesion of overlaps or joints in the vapour check, can have serious consequences.

Such a defect can have the same effect as a long gap between a window frame and the masonry. Nobody would tolerate a gap there. Defects in the vapour check should be treated in just the same way.

Only an insulating layer which is free of gaps and defects achieves maximum insulation



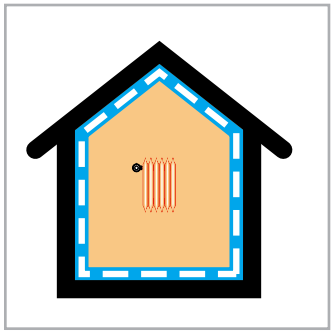
Measurements were taken at an air temperature difference of +20° C indoors and -10° C outdoors, a pressure difference of 20 Pa (equivalent to wind force 2-3) using conventional, fibrous insulating material.

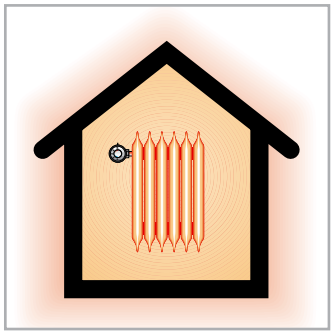
Measurement carried out by: Institut für Bauphysik, Stuttgart; Source: DBZ 12/89, pp. 1639

U-value with air-tight vapour check = 0.30 W/m²K
U-value with 1 mm gap in vapour check = 1.44 W/m²K

A factor of 4.8

CO_2 emissions/cost-effectiveness of thermal insulation





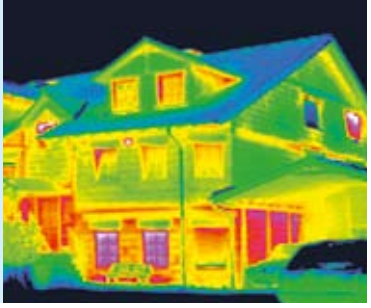
Maintain the same indoor temperature ...

... and save energy and heating costs with perfect insulation. Airtight building insulation ensures that warmth is kept in the house, rather than being wasted by escaping into the atmosphere.

The increased heating costs caused by leaks in thermal insulation make the insulation less efficient for the builder. It also leads to higher CO_2 emissions in comparison to when heating well insulated buildings. According to a study conducted by the Institut für Bauphysik (Fraunhofer Institute for Construction Physics) in Stuttgart, Germany, the U-value of a thermal insulation structure falls by a factor of 4.8. In real terms, this means that it takes the same amount of energy to heat a house with 80 m² of floor space with gaps in its insulation as it does to heat an airtight house with about 400 m² of floor space.
Uncontrolled CO_2 emissions promote the greenhouse effect – and humanity is beginning to feel the consequences, such as, more frequent and destructive storms. It is therefore very important to make every effort to cut CO_2 emissions. This can be achieved not only by restricting our lifestyle, but also by employing intelligent solutions, which protect the environment. According to a survey conducted in 2000, a typical central European house uses 22 litres of heating oil per m² of floor area (220 KWh/m²), whereas a passive house uses just 1 litre/m² and a lower energy house uses 3 l/m² – if the insulation is intact. Gaps in a building's airtightness layer multiplies the energy consumption for heating per m² several times!

A lot of intelligent solutions already exist, just the awareness is lacking.

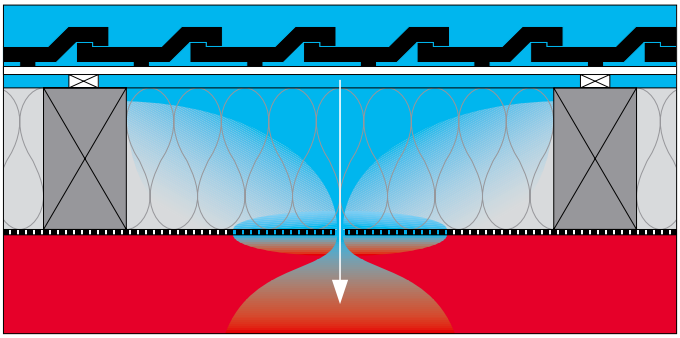
Airtightness –
for comfortable living conditions all year round



When heating, the relative humidity in occupied rooms should be between 40 – 60% for comfort.
The protection against heat provided by insulation in the summer is expressed in terms of the number of hours it takes for the temperature below the roof to reach the inside of the structure (phase shift) and the accompanying rise in indoor temperature in °C relative to the outdoor temperature (amplitude damping).

Leaks reduce the level of comfort

Dry ambient air
The dry air that is often found in rooms in the winter is due to cold outside air coming into the house through gaps in the structure. As this cool air heats, its relative humidity drops, resulting in uncomfortable dry air.

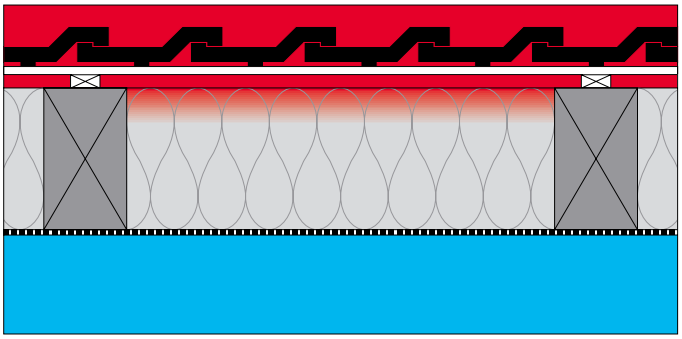


Achieving pleasant air humidity in the winter

For example:
Air at a temperature of -10° C at 80% relative humidity can hold 1.7 g/m³ of water at most (standard outdoor winter air iaw. DIN 4108-3). If this air is then heated to 20° C (standard indoor winter air) the relative humidity falls to just 9.9%.

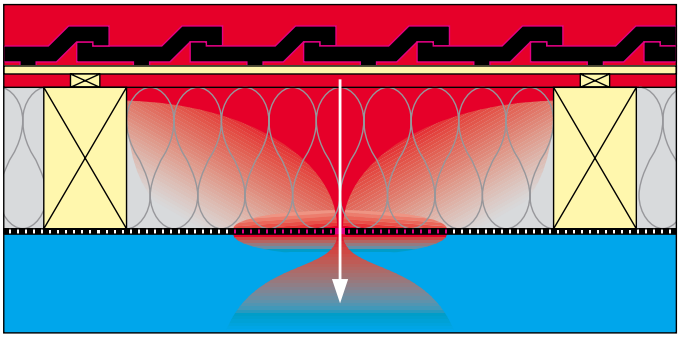
1.7 [g/m³]
= 9.9 % of 17.3 g

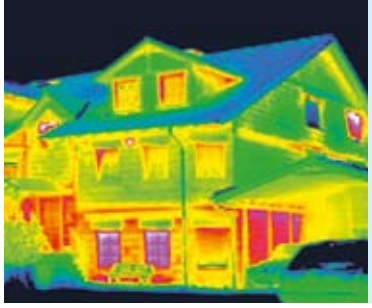
Summer insulation
When calculating the phase shift and the amplitude damping it is assumed that the heat needs to progress pore-by-pore. There is no air flow or convection through the insulation.



Cool rooms in the hot summer sun

Gaps in the airproofing layer allows high levels of air exchange to occur between the building and the external environment due to the high temperature difference and the resulting pressure difference.
This means that the insulation is no longer able to contribute effectively to protecting you from the summer heat.





Air tightness – to prevent structural damage

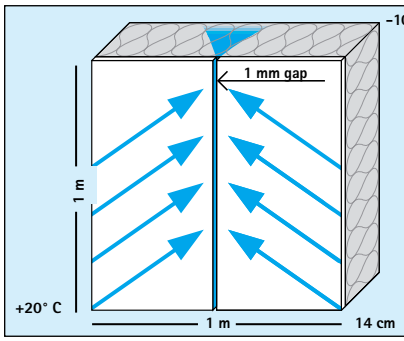
pro clima®

Mould – a major cause of health problems

Dampness in building materials frequently causes mould growth. Many mould fungi produce toxins, MVOC (microbial volatile organic compounds) and spores as secondary metabolites, which can result in allergic reactions.

Fungi are regarded as the most prevalent allergens, so avoiding contact with them is very important, regardless of whether the MVOC or spores enter the body with food (ingested) or from the air (inhaled).

Structural damage caused by humidity penetrating from outdoors

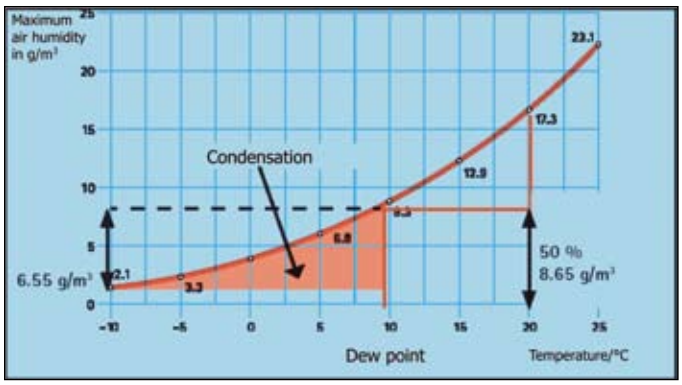


Measurements were taken at an air temperature difference of +20° C indoors and -10° C outdoors, a pressure difference of 20 Pa (equivalent to wind force 2-3) using conventional, fibrous insulating material and a vapour check with a s_d value of 30 m.

Measurement carried out by: Institut für Bauphysik, Stuttgart; Source: DBZ 12/89, pp. 1639

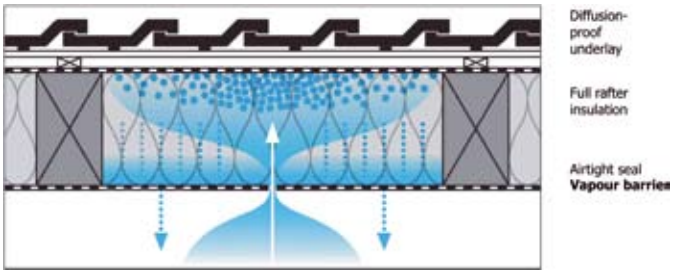
The gap in the vapour check described here allows 800 g of humidity into the structure per metre length by convection on a typical winter's day. Only 5 g of humidity is able to penetrate a gap-free insulating layer with a vapour check (s_d = 2.3 m) by diffusion in the same period.

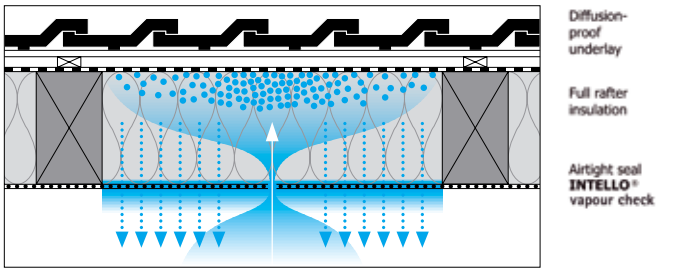
The cause of condensation within a building's structure



In the winter the indoor air with a relative humidity of 50% and a temperature of 20° C cools down as it passes through the thermal insulation. The condensation point thus drops to 9.2° C. If the temperature drops below this point, condensation is formed. If the temperature drops to -10° C then 6.55 g of condensation forms per m^3 of air.

Vapour checks are safer than vapour barriers



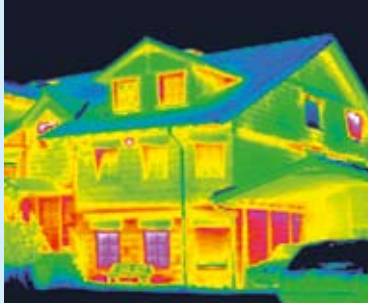


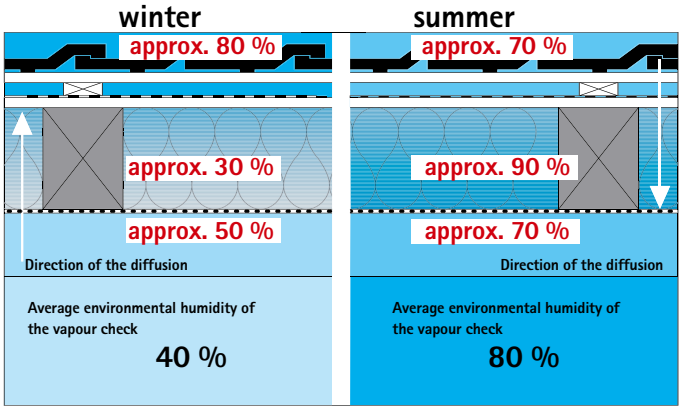
Structural damage can result from high humidity within the structure. Impermeable vapour barriers, which have a high vapour diffusion resistance, rapidly become humidity traps, particularly if full rafter insulation is used in combination with a diffusion-tight underlay.

What is crucial for the prevention of structural damage is the extent of drying capacity within the construction. Vapour checks with a variable diffusion resistance depending on the humidity provide effective protection against damage to the structure due to moisture from condensation. They are diffusion inhibiting in wintertime and diffusion open in summertime.

Drying capacity > moisture stress
= freedom from structural damage

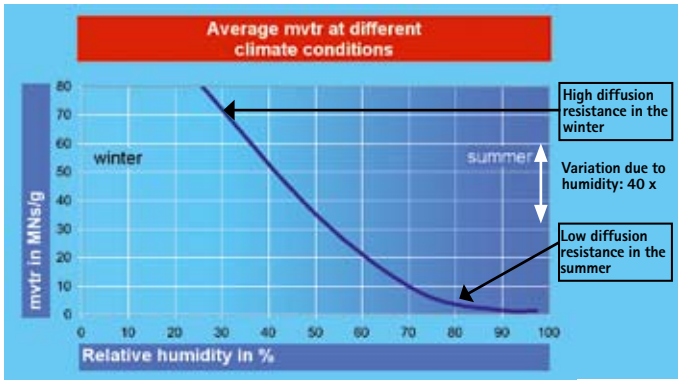
Drying capacity < moisture stress
= structural damage





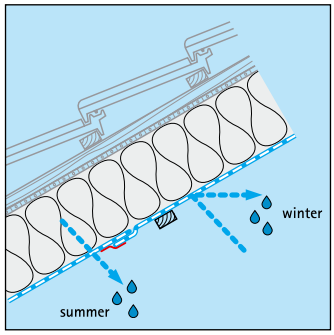
Moisture physics in the roof

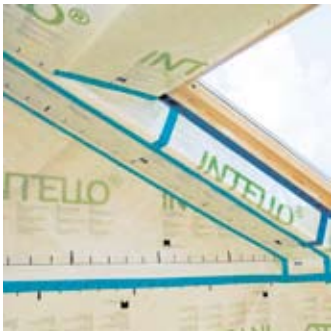
The average ambient humidity of the vapour check is approx. 40% in the winter. The direction of diffusion is from inside to outside. The vapour check needs to have a high resistance to diffusion in order to protect the structure against condensation. In the summer, the direction of diffusion is reversed (vapour check at > 80% rel. humidity). Now the vapour check needs to be permeable in order to allow the humidity to evaporate.



The ideal solution: a vapour check with humidity variable diffusion resistance

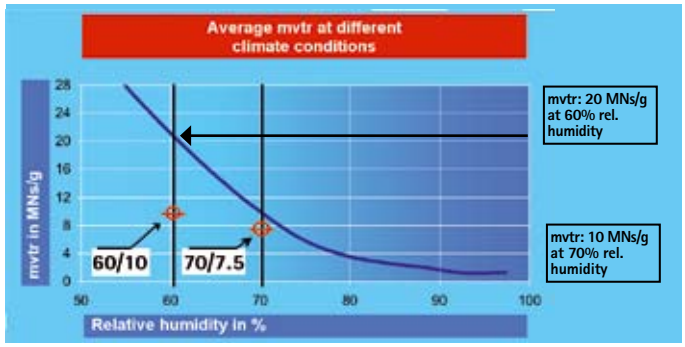
The INTELLO® and INTELLO® PLUS vapour checks combine these characteristics. In the winter they have a higher diffusion resistance, giving high protection against condensation, and in the summer they are diffusion open, allowing maximum drying of the structure. In the winter the vapour check is around 100 times less permeable than it is in the summer.





High structural security potential

The drying potential during the summer gives the structure added drying capacity against unexpected humidity or damp.
A drying capacity which exceeds the moisture that the structure is exposed to protects it against structural damage.



The 60/10 and the 70/7.5 rules

If the air humidity is higher, for instance in new buildings, bathrooms, or kitchens, then the diffusion resistance at a medium relative humidity such as 60% needs to be above 10 MNs/g in order to protect the structure from mould. INTELLO®, at 20 MNs/g, is well within the acceptable range. During construction, particularly during screed laying and plastering, the average relative humidity is around 70%. This requires a diffusion resistance of over 7.5 MNs/g in order to prevent mould formation. INTELLO® also copes with this 70/7.5 rule easily.

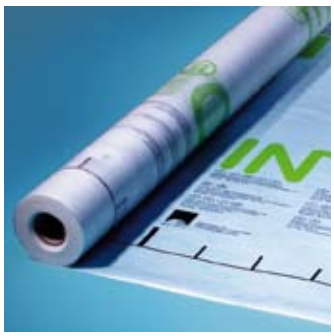
The pro clima security formula:

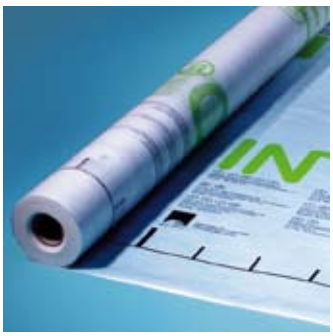
Drying capacity > moisture stress = freedom from structural damage

Maximum security for all buildings and structures with pro clima vapour checks

pro clima®

The ideal vapour check for thermal insulation





pro clima INTELLO®

vapour check for full rafter insulation

Roll width	cm: 150	150
Roll length	m: 20	50

Diffusion into the thermal insulation structure in the winter	7 g/m² per week
Diffusion out of the thermal insulation structure in the summer	560 g/m² per week

High level of protection against structural damage
pro clima vapour checks are suitable for use in residential housing in every room (living and bedrooms, kitchens and bathrooms) as the internal vapour check on the warm side of the insulation.

The high performance vapour checks INTELLO® and INTELLO® PLUS provide maximum protection for the thermal insulation structure. They achieve the world's highest humidity-variable diffusion resistance suitable for all types of climates by being able to vary their diffusion resistance by a factor of 40.
In cold, wintry weather INTELLO® and INTELLO® PLUS are almost entirely impermeable (mvtr > 50 MNs/g), whilst in summery weather they have very high permeability (mvtr approx. 1 MNs/g).
This means that the humidity which the structure is exposed to in the winter is kept to a minimum (approx. 7 g/m² per week) whereas the vapour check offers a high degree of drying capacity in the summer (approx. 560 g/m² per week).
Even for critical structures, which are impermeable on the outside, such as pitched roofs with flexible metal sheet roofing, bitumen roof lining, flat roofs, green roofs, etc., the high performance vapour checks INTELLO® and INTELLO® PLUS provide the highest protection against structural damage available worldwide, even in very cold climates.
INTELLO® and INTELLO® PLUS protect the building against mould and thus the occupants' health.
Detailed information on the physics of thermal insulation is given in the report "Calculating potential freedom from structural damage of thermal insulation structures in timber-built systems" which is available on request.

Recommended applications: laying with insulating mats and boards
INTELLO® and INTELLO® PLUS should be laid with the membrane-coated side (with the writing on) facing indoors. They can be laid flat either horizontally or vertically on the sub-structure (such as the rafters) without sagging.
If laid horizontally (at right angles to the sub-structure) then the maximum space permitted between the rafters is 100 cm.
After laying, it is necessary to support the weight of the insulation with lathing on the inside. The laths should be no more than 50 cm apart.
Staples (at least 10 mm wide and 8 mm long), between 10 and 15 cm apart, should be used to attach the membrane when using insulating mats or boards. The sheets of membrane should overlap by between 1 and 10 cm.
The best time to install the insulation is 2 weeks after the neighbouring walls have been rendered. Alternatively, it can also be installed before rendering. The humidity which enters the building structure during construction (e.g. from plaster or screed) should be dried out as soon as possible. The use of a dryer is recommended in cold climates. Note for DIY builders: Install the vapour check together with the insulation. If the insulation is left without a membrane for a prolonged period in the winter there is a risk of condensation forming. Once the insulation has been installed it is important for the vapour check to be fixed as soon as possible in order to prevent the insulation becoming moist from the indoor air.

Installation with blown-in insulation (e.g. cellulose)
INTELLO® PLUS can also be used as a membrane for all types of blown-in insulations.
A reinforcing layer prevents stretching during injection of the insulation material. If laid along the sub-structure it has the advantage that the overlap is supported on a firm foundation and is therefore protected. The staples used to attach the membrane should be between 5 and 10 cm apart.
If laid at right angles to the sub-structure a supporting lath should be attached directly onto the overlap of the membrane after it has been stuck and made airtight, in order to prevent the tape from being subjected to tension. Alternatively, reinforce the tape along the overlap by sticking tape at right angles to the overlap every 30 cm. We recommend that you then test that the airproofing layer is airtight using a WINCON or a BLOWER DOOR.

Planning and construction

Moisture due to use
The diffusion resistance of INTELLO® and INTELLO® PLUS is designed to ensure that an effective diffusion resistance is maintained even in high humidity conditions, for example in newly built houses or in rooms which are prone to high short-term humidity levels, such as kitchens and bathrooms.

The 60/10 rule
Newly built houses have high indoor humidity levels due to moisture released during construction and due to use. The diffusion resistance of the vapour check should be such that it is at least 10 MNs/g even at an average relative humidity of 60% in order to adequately protect the structure from airborne humidity and thus prevent mould. INTELLO® has a diffusion resistance of approx. 20MNs/g at a relative humidity of 60%.

pro clima vapour checks

The 70/7.5 rule
During construction, when plaster or screed is being laid, the humidity in a building can be very high. At an average relative humidity of 70% the diffusion resistance of a vapour check should be above 7.5 MNs/g in order to protect the structure from excessive moisture from the high humidity on the building site and thus preventing mould growth. Particularly good protection against humidity is needed if wooden cladding is used on the outside of the structure. INTELLO® comfortably exceeds this, with a diffusion resistance of 10 MNs/g at a relative humidity of 70%. The moisture caused by building should always be allowed to escape from the building as rapidly as possible by ventilating well (through open windows). Dryers are recommended in the winter to accelerate the drying process. This is necessary to prevent the high relative humidity persisting long-term.

Notes on construction
To enable humidity variable vapour checks to achieve maximum efficiency, no layers which may prevent diffusion, such as OSB or plywood, should be applied on the inside of the insulating layer. Plasterboard or matchboard panels are suitable, however.
If no panelling is planned then the membrane should be protected from direct sunlight.
pro clima DA is suitable for this purpose.

The effects of thermal insulation
The high level of protection against structural damage afforded by humidity variable vapour checks can only be achieved using permeable fibre-based thermal insulation, since the moisture needs to be able to diffuse to allow the structure to dry out in hot weather. Fibrous insulation, such as cellulose, flax, hemp, wood shavings, rockwool or mineral wool are ideal.

Composition and environmental considerations
The high performance vapour checks INTELLO® and INTELLO® PLUS are made of 100% polyolefin – the special membrane is made from a polyethylene copolymer, and the fleece and reinforcing matting of polypropylene. This allows for easy recycling.
pro clima INTELLO® and INTELLO® PLUS have a fire rating of B2 iaw. DIN 4102 and are approved by the DIBt as construction products according to the German Bauregelliste Teil C (Construction Product List C).
For buildings in locations higher than the specified altitudes, with an under-roof lining which is impermeable on the outside or which are subject to any other abnormal conditions please call our technical Hotline.

Applications of INTELLO® and INTELLO® PLUS
The higher the potential freedom from structural damage, the greater the protection against structural damage.
In contrast to PE films, INTELLO® and INTELLO® PLUS, as well as reducing diffusion, also allow the structure to dry out. This gives pitched roofs far greater protection against structural damage. The difference is most noticeable for load-bearing, critical structures.
North-facing roofs with impermeable roof lining (e.g. bitumen roof lining) or impermeable roof coverings (such as flexible metal sheet roofing) with PE films have a potential freedom from structural damage of just 10 g/m^2, whereas with INTELLO® this figure rises to 1,500 - 3,000 g/m^2.

The applications of INTELLO® are defined for two distinct climatic regions:
1. Ireland, England, Wales, the Scottish Lowlands: temperate climate and medium intensity solar radiation.
2. Central Scottish Highlands and Highlands and north of Inverness: cold climate and low intensity solar radiation.

In Ireland, England, Wales and the Scottish Lowlands the following applications are recommended for INTELLO®:

For all types of roof:
- with or without ventilation
- permeable or impermeable on the outside
- any type of roof covering (slates, tiles, metal)
- gravel and green flat roofs with max. 13 cm of substrate (without ventilation)

Walls:
Walls should be as permeable on the outside as possible.
If materials which block diffusion, such as OSB, are used on the inside of the thermal insulation rather than the outside (for example as a stiffening layer) then the level of protection against structural damage is significantly increased.
External insulation is recommended for solid constructions. INTELLO® provides the highest level of protection for structures built using materials which are either permeable or impermeable:

The following materials are suitable for timber frame construction of walls:
- OSB outside with a timber shell and a permeable wall lining membrane
- softboard outside
- plywood outside
- timber shell outside

The following materials are suitable for solid walls with internal insulation:
- concrete bricks
- bricks
- concrete

The masonry must be dry and there must be no rising damp.

In the cold climate of the Scottish Highlands and Central Highlands as well as north of Inverness the following applications are recommended for INTELLO®:

Sloping pitched roofs:
- permeable on the outside: all roofs
- impermeable on the outside: grey tile roofs inclined at less that 25°, roofs with black tiles inclined at less than 40°

For roofs with impermeable underlays in the Scottish Highlands and Central Highlands and north of Inverness back ventilation adds additional protection, but it is important to ensure that this also functions adequately in all spaces between the rafters in the winter.

pro clima vapour checks and adhesive tapes

Please call our technical Hotline for hints and tips on constructions.
It is impossible to use humidity variable vapour checks for insulation between the rafters in gravel and green flat roofs in this climate. They can only be used for insulation above the rafters in conjunction with a vapour barrier with a metal layer.

Walls:
Walls should be as permeable on the outside as possible.
If materials which block diffusion, such as OSB, are used on the inside of the thermal insulation rather than the outside (for example as a stiffening layer) then the level of protection against structural damage is significantly increased.

External insulation is recommended for solid construction.
INTELLO® provides optimum protection for structures which are diffusion resistant on the outside:

The following materials or cladding are suitable for timber frame construction:
- softboard outside
- OSB and plywood cannot be used outside. If OSB or other wood based panels are required for stiffening the wall it is beneficial if they are inside the insulating layer, or if at least some of the insulation is outside this layer (please call our technical Hotline if you require further information.)

The following materials are suitable for solid walls with internal insulation:
- Internal insulation of concrete bricks
- Internal insulation of bricks

Rough stone walls and concrete should only be built using external insulation.

The masonry must be dry and there must be no rising damp if internal insulation is used.

pro clima DA 3-layer vapour check for outer roof insulation

Roll width	cm:	150
Roll length	m:	50

pro clima TIP

pro clima DA
roofing underlay for use on pitched roofs

Adhesives
e.g. DUPLEX, CONTEGA PV, gaskets, cf. pro clima APPLICATION MATRIX

Details/methods
see pages 21-21

In situations where insulation above the rafters is used, the vapour check also needs to protect the building from the elements during construction and needs to be non-slip and tear-resistant so that it can withstand being walked on. pro clima DA meets all of these requirements.

It is made up of three layers.
The green outer layer protects the membrane below it from damage. It is made from a rough polypropylene fleece, which is extremely non-slip, even when it is wet.
The lower protective fleece layer protects the membrane against damage by the substrate during laying.

The special membrane between these two outer fleece layers is waterproof to over 2,500 mm of water column, which means that it is waterproof even when subjected to heavy rain. Its excellent s_d value of 2.30 m increases the protection at the entire structure in the event of unforeseen moisture entry.

pro clima DA can be exposed to the elements for 4 months. It must only be fitted using staples in areas protected by an overlap.

Unlike other insulation used between the rafters, it is not possible to perform quality control, either using a pressure differential method such as using the pro clima WINCON, or by means of a visual test, such as the BLOWER DOOR. It is therefore imperative that all taping and attachment is done with utmost care. Detailed planning, particularly of fitting at the eaves and gables, is very important, as is careful execution when fitting the insulation over the rafters.
Fire Rating B2 iaw. DIN 4102.
DIBt Approved as a construction product according to the German Construction Product List C.

ORCON F

- High strength on building material substrates
- long lasting adhesion and elasticity
- goes a long way (one 310 ml [g] cartridge is sufficient for approx. 15-30 m; a 600 ml tube for approx. 30-60 m)
- Frost resistant to -20° C
- Temperature range: -40° C to +100° C

ORCON F has exceptionally high inner strength (cohesion) while also being elastic. Its outstanding adhesion to building materials gives the joint the necessary safety and longevity. This adhesive is made of non-ageing acrylate polymers without softeners or halogenated compounds which is insusceptible to embrittlement. This adhesive contains denatured alcohol (15%), allowing it to penetrate deep into stone substrates, ensuring a very tight bond.

Airproofing adhesive

Substrates
ORCON F is suitable for bonding all of pro clima's vapour checks and air-proofing membranes, PE/PA/PP and aluminium foils to other building materials regardless of whether they have a smooth, or rough or stony surface. Unstable or crumbling surfaces either need to be removed or grounded and stabilised using BUDAX AC. Slight dampness of the substrate slows the drying process, but is otherwise not a problem if it is able to dry out.
On unprotected metal surfaces one of the pro clima adhesive tapes should be used.

Application
All surfaces should be clean and free of dust, grease and silicone. A continuous adhesive bead of at least 3 mm in diameter (depending on the substrate) should be applied to the clean surface. Two application methods are possible. The wet bonding method involves direct application of the vapour check to the adhesive immediately after application and while still wet, without applying force. One of the substrate materials needs to be permeable so that the solvent from the adhesive is able to evaporate. All of pro clima's vapour checks can easily be bonded to adjacent building materials using the wet method.
For the dry method the adhesive needs to dry for 1-3 days after application. The vapour check is then pressed onto the dry adhesive. The dry method is significantly more time-consuming than the wet method and is only recommended in situations where the vapour check and the substrate are both impermeable, for example if PE film is applied to concrete bricks.

pro clima TIP
pro clima **ORCON F** does not require a pressure lath

CONTEGA PV

pro clima CONTEGA PV forms a high quality bond between vapour check, wood based panels (e.g. OSB) and masonry.
The airtight bond is completed once the light blue PET fleece is plastered into place. The latex-reinforced layer increases the strength of the adjoining plasterwork.

High quality bonding to adjoining masonry

pro clima TIP
Applications and individual solutions
from page 16

pro clima adhesive tapes meet the highest standards

Adhesive tapes for airproofing

pro clima adhesive tapes for bonding air-proofing membranes have very high tack (initial adhesiveness). The high final adhesion achieved by the bond is reached very quickly. The adhesive tape is made of a non-ageing acrylate which is free of solvents or softeners. This, combined with its high UV and temperature resistance, ensures a long-lasting bond. It is also exceptionally water proof after bonding.

Application and substrates
All pro clima adhesive tapes can be applied to smooth, stable surfaces which are free of dust, grease and silicone. For example, building paper, PE, PA and aluminium foil, planed timber, wood based panels, plastic and metal surfaces. The tape must be pressed firmly onto the surface during application, for instance using the pro clima tape applicator. The strength of the bond depends on the pressure exerted when applying the tape. The tape can be applied above -10° C and it is highly temperature resistant between -40° C and +90° C. pro clima tape should not be applied to icy surfaces since the moisture contained in the ice would form a layer between the tape and the substrate after thawing.

Rapid-application tape without release paper

Roll width	cm:	5
Roll length	m:	30

RAPID CELL

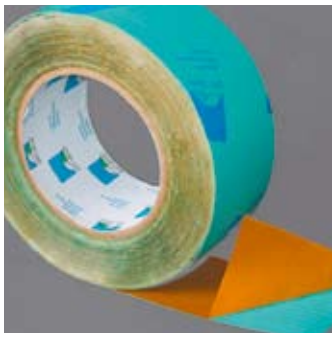
- No release paper
- Time saving in comparison to tapes with release paper: approx. 60%
- Bonds overlaps between sheets of vapour check and joints between wood based panels (such as OSB)
- Tears off easily

Permeable universal tape

Roll width	cm:	6
Roll length	m:	30

UNI TAPE

- With release paper
- Bonds overlaps between sheets of vapour check
- Tears off easily
- Permeable



pro clima TIP

Applications and individual solutions
from page 12

Adhesive tapes for perfect airtightness

ELASTO

- Tears off easily
- Seals around rounded holes, e.g. around pipes
- Highly impermeable
- Backing: reinforced PE film
- With release paper

Flexible tape for sealing penetrations

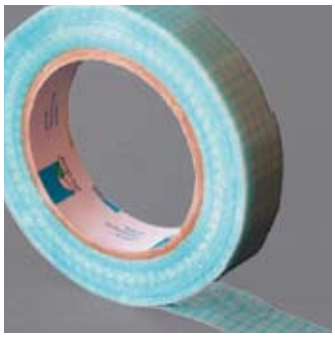
Roll width	cm:	6	6
Roll length	m:	30	3

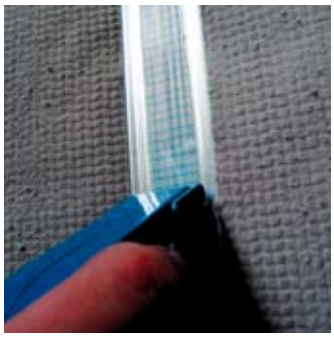
TESCON PROFIL

- Release paper comes off in strips for quick and awkward jobs in tight corners
- Suitable for (roof) windows, doors, planed timber, corners
- Offers high protection against piercing in corners due to its high elasticity

Adhesive tape with 3-part release paper

Roll width	cm:	6
Roll length	m:	30





DUPLEX

- Suitable for airtight and moisture-proof sealing of pro clima DA
- For rain-proof taping of roof underlay (e.g. SOLITEX UD)
- For affixing membrane to metal sections in dry construction
- Quick and easy to apply using the DUPLEX hand dispenser

Double-sided tape

Roll width	cm:	2.5
Roll length	m:	20

UNI TAPE XL
UNI TAPE XL easy

- Suitable for sealing injection holes indoors
- TAPE XL easy: pre-cut plasters
- Backing: special reinforced paper
- With release paper

Repair tape

TAPE XL

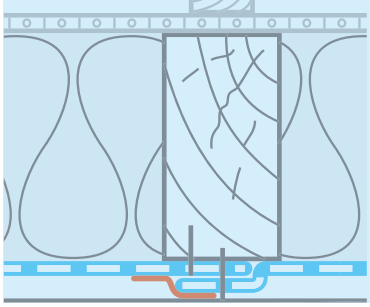
Roll width	cm:	15	20
Roll length	m:	30	30

TAPE XL easy

Roll width	cm:	15	20
Roll length	m:	30	30

pro clima TIP

Applications and individual solutions
from page 12

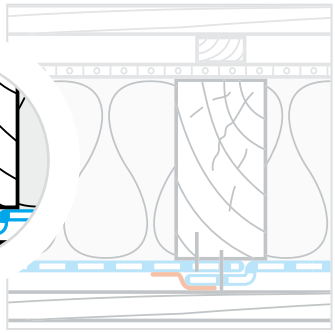


Sticking on flat surfaces
• Overlaps of vapour check layers

sealing of sheet overlap

Overlaps of humidity-variable vapour checks such as INTELLO® and INTELLO® PLUS as well as PE, PA and aluminium foil can be sealed using any pro clima adhesive tape so that they are airtight. For vapour barriers, for example PE or aluminium foil, pro clima ELASTO is best suited since it is highly impermeable.
In specific cases involving complex or demanding structures that are sealed with impermeable layers both inside and outside, please consult the ecological building systems technical hotline to discuss the most suitable adhesive tape to use for your application.
pro clima RAPID CELL tape without release paper has the advantage that it can be applied much faster than tapes with release paper.
This is a money-saving method of taping the overlaps.
Time savings of between 50 and 60% can be achieved. For more detailed recommendations, please refer to the current pro clima application matrix.

Installing parallel to the sub-structure

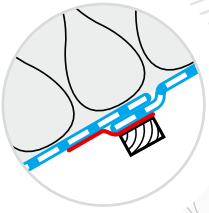


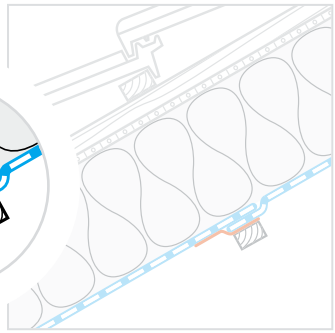
Installing the tape along the sub-structure, for example along the rafters, has the advantage that the overlap has a firm foundation.
It is therefore possible to exert a lot of pressure on the tape. The overlap isn't subjected to forces by the thermal insulation, allowing an ideal bond to be formed.

pro clima TIP

Use **RAPID CELL** tape for a quick job

Installing at right angles to the sub-structure





When applying the sheets of membrane at right angles to the sub-structure, for example at right angles to the rafters, make sure that the sheets of INTELLO® or INTELLO® PLUS vapour check are stretched tight to allow as much pressure as possible to be exerted when applying the tape. Since the insulation is resting on the overlap and may exert a force on it, ensure that you apply the tape centrally.
If using blown-in insulation then installing along the sub-structure is recommended.
If laid at right angles, affix laths below and parallel to the tape in order to reduce the load exerted on the tape by the insulation. Or apply additional tape at right angles to the overlap every 30 cm.

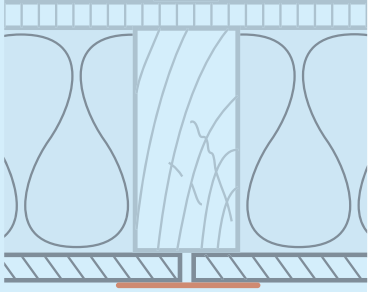
pro clima TIP

When applying tape ensure that the substrate is firm enough to allow sufficient force to be exerted.

pro clima TIP

For details on working with foam insulation see also page 6.

Sticking on flat surfaces
• Joints between wood based panels

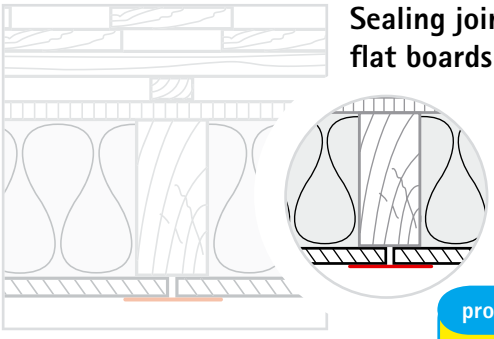


Composite wood based panels such as OSB, plywood and chipboard can be used to form an airproofing layer if joints and abutments are sealed with an airtight seal.

Joints between boards can be sealed using any of pro clima's single-sided adhesive tapes.

Sealing joints between wood based panels

The ideal tape for such applications is pro clima RAPID CELL.
By eliminating release paper the number of steps in the application process is greatly reduced. There is no need to remove, collect or dispose of the paper. This allows you to achieve time savings of up to 60% in comparison to conventional tape, thus saving you money.



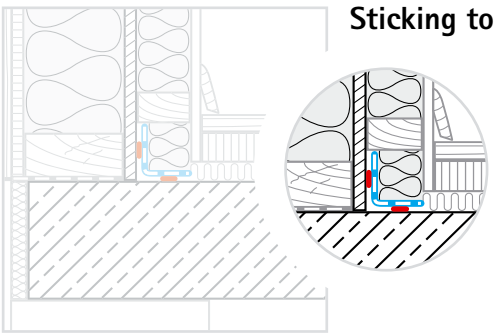
Sealing joints between flat boards

pro clima TIP

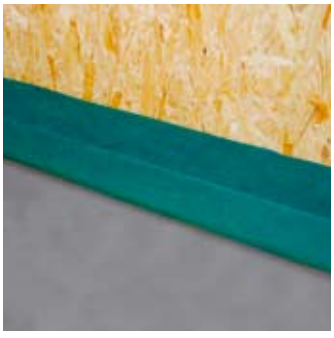
Achieve time savings of 50-60% with **RAPID CELL**

Using the DKF double dispensing gun you can apply two strands of ORCON F to concrete or OSB panels. Press the strip of DA-S onto the adhesive without squeezing it in.

ORCON F does not stick to the silicone-coated surface of pro clima RAPID CELL tape. To complete the airtight seal, apply a strip of pro clima UNI TAPE at right angles to the RAPID CELL tape.



Sticking to concrete slabs



Sticking to adjacent building materials

Rough surfaces
- **Concrete**
- **sawn wood**
- **plaster**

Sticking sheets of membrane to
- **floorboards**
- **Eave plates/tie beams**
- **plastered end walls/ concrete**

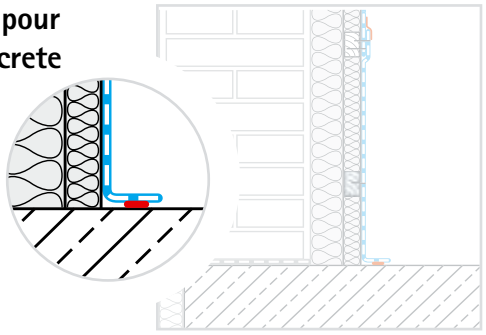
Joints are the most vulnerable areas in an airtight seal. Gaps here usually cause serious structural damage.
Stick the vapour check to rough surfaces using pro clima ORCON F airtight joint adhesive.
Sweep the surface to remove dust and debris before application.

Using pro clima ORCON F you can fill voids up to 2 cm deep, making it suitable even for use on rough concrete slabs.
Ground any unstable or crumbling surfaces.

We recommend the dry bonding method for sticking impermeable materials (such as PE or aluminium foil) to concrete surfaces.

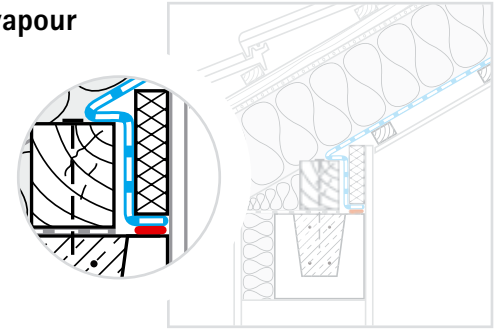
For more information on pro clima ORCON F airtight joint adhesive please see page 9.

Sticking the vapour check to a concrete floor slab



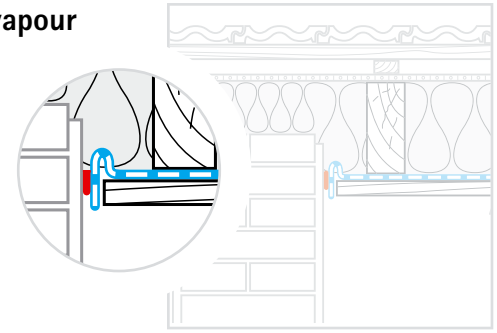
Sweep the concrete surface and use solvent-free BUDAX AC to remove fine dust if necessary.
Stick the vapour check or a strip of vapour check, e.g. DA-S, to the floor slab using pro clima ORCON F. Fill any gaps around brackets or screws with airtight joint adhesive.

Sticking the vapour check to an eave plate



Install the vapour check over the eave plate and stick it onto the tie beam using ORCON F, in order to form a seal between the eave plate and the tie beam too.

Sticking the vapour check to a plastered end wall/concrete

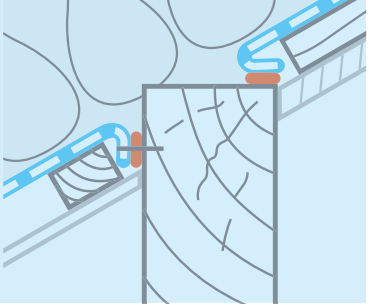


Install the vapour check with sufficient slack to allow for movement in the structure.
You don't need to use a pressure lath with ORCON F. We do, however, recommend the use of a pressure lath if laying the vapour check in frosty weather, when the adhesive will take longer to dry, or if the substrate is unstable.

pro clima TIP

ORCON F does not require a pressure lath

Sticking to adjacent building materials

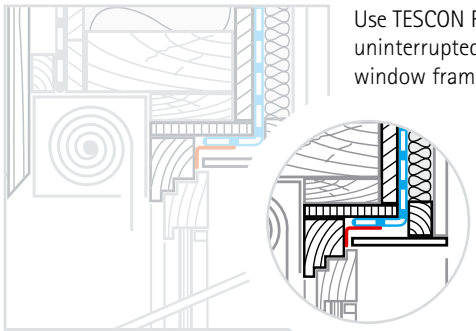


<u>Smooth</u> surfaces
- **fair-faced concrete**
- **wood – planed, sanded or painted**
- **metal and plastic**

Vapour checks can be glued to smooth surfaces using any of pro cilma's adhesive tapes, either single-sided tape or double-sided DUPLEX tape.

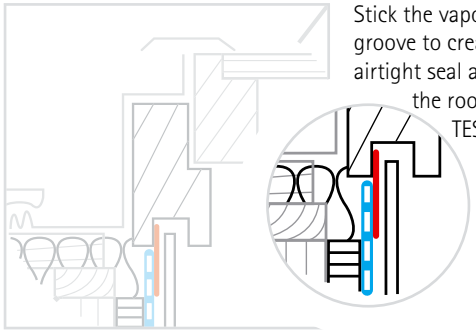
For unprotected metal surfaces such as iron we only recommend the use of adhesive tape due to the risk of corrosion.

Sticking the membrane to
- **windows and doors**
- **planed purlins**
- **planed holes in boards**



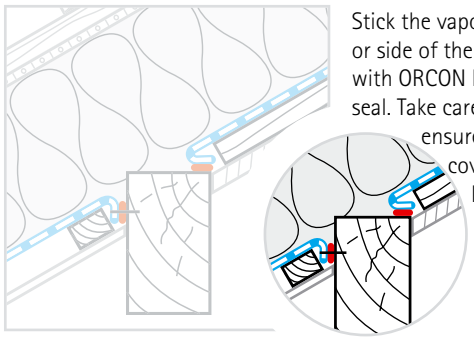
Use TESCON PROFIL to create an uninterrupted airtight seal around window frames.

Sticking to window frames or wood based panels



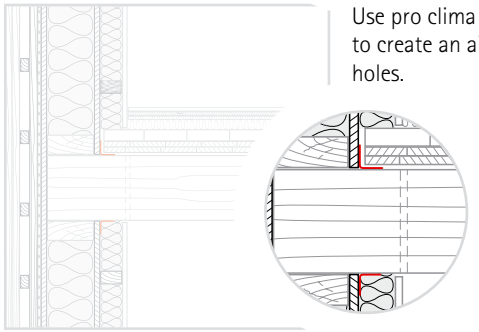
Stick the vapour check into the groove to create an uninterrupted airtight seal around the frame of the roof window using TESCON PROFIL.

Sticking to roof window frames or wood based panels



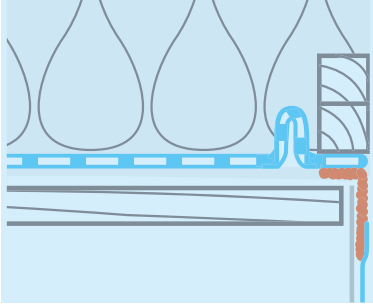
Stick the vapour check to the top or side of the planed middle purlin with ORCON F to create an airtight seal. Take care when positioning to ensure that it is properly covered by the inner lining!

Sticking visible middle or ridge purlins and vapour check or wood based panels



Use pro clima TESCON PROFIL to create an airtight seal around holes.

Sealing holes in boards and vapour check or wood based panels



Sticking to unrendered surfaces

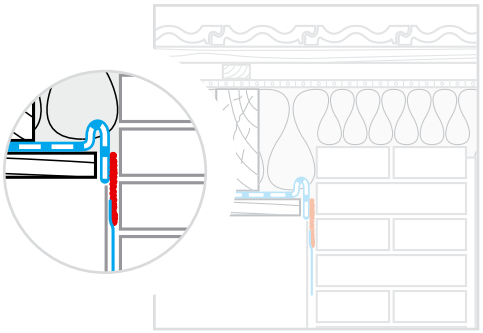
CONTEGA PV

Sticking membrane sheets and wood based panels to unrendered masonry

Joints between sheets of air-proofing membranes are a critical point in the airtight sealing of a building.
If the masonry is unrendered then the vapour check can either be applied by the plasterer when rendering the wall using reinforced plaster or a plaster baseboard, or the membrane can be applied after rendering. Both methods involve an element of risk that the joint won't be completely airtight or are complicated.

CONTEGA PV plaster bond tape can be used to form an effective joint between the vapour check and the plaster. Including a vapour check in the structure also prevents moisture entering the structure at the joint. The vapour check is joined to the airtight CONTEGA PV fleece with the integrated tape. Embedding the fleece in the central layer of the plaster forms an airtight connection from the membrane to the plaster rendering on the wall. Gypsum based plaster bonds very well to the Contega fleece, for exterior plaster and cement plaster bonding layers, for example reinforced mortar, is required.

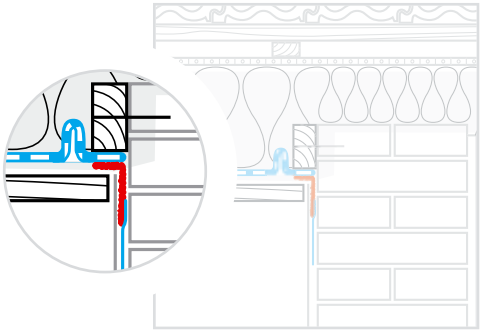
First rafter



Sticking the vapour check to the masory/plaster without a firm foundation.

It is important to ensure that there is some slack to compensate for movement of the structure.

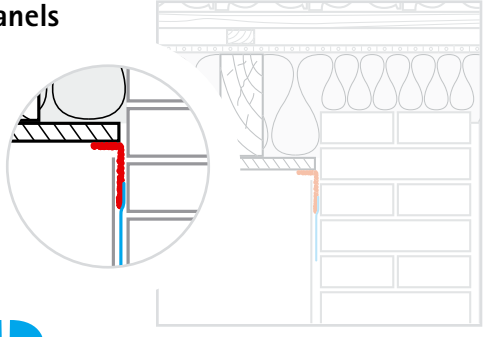
Lathing



Sticking the vapour check to the masory/plaster supported by laths or battens.

CONTEGA PV can also be affixed to a supporting lath or batten on the wall.

Wood based panels



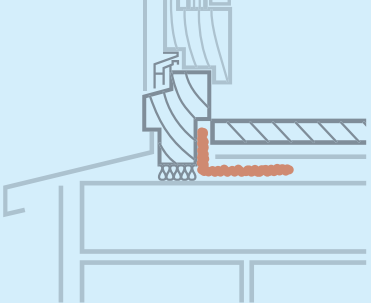
Sticking wood based panels to masonry/plaster.

When sticking wood based panels to unrendered masonry, apply CONTEGA PV to the bonding edge of the panel.

pro clima TIP

The reliable solution:
CONTEGA PV
plaster bond tape

Sticking to unrendered surfaces



Fix the CONTEGA PV tape in position on the wall with nails or spots of ORCON F.

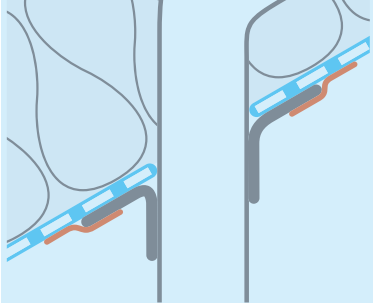
On soft substrates such as expanded concrete, pumice concrete or hollow elements you can nail directly into the bricks, otherwise nail between the bricks. The airtight CONTEGA PV fleece is subsequently embedded in the central layer of the plaster.

Avoid voids or air bubbles below the tape, i.e. make sure that the tape is firmly stuck to the wall, especially at the top edge of the tape.

Gypsum plaster bonds very well to the fleece. If using exterior plaster or cement plaster a bonding layer, for example reinforced mortar, is required.

Once you have attached the CONTEGA PV fleece to the wall, stick the vapour check to the tape on the CONTEGA PV, leaving some slack to allow for movement.

CONTEGA PV
High quality bonding of the airproofing layer



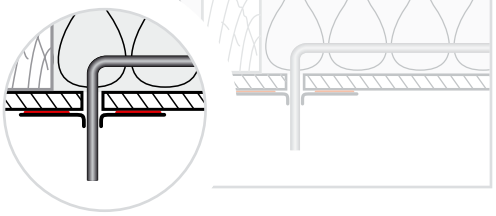
Round penetrations

Airtight grummets

ELASTO
Sealing pipes and cables

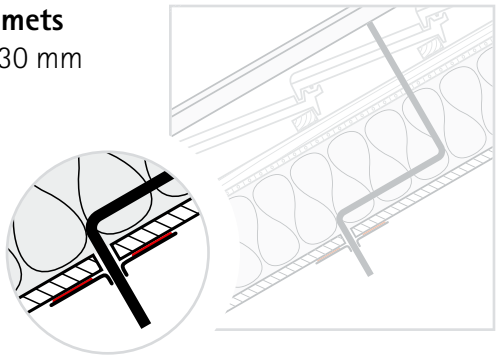
Creating an airtight seal around pipes and cables which pass through the airproofing layer (e.g. pro clima INTELLO® or OSB panel) is quick and cost-effective using pro clima airtight grummets. These grummets are made of non-ageing elastic EPDM rubber and are available in a range of sizes from 6 up to 120 mm. Another advantage of these grummets is that the cable or pipe can easily be moved within the gasket after installation if necessary. Alternatively, it is also possible to seal pipes using pro clima ELASTO.

Single or double cable grummets
Diameter 6 - 12 mm



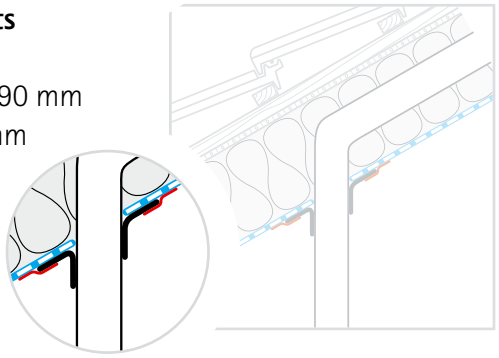
Single or double cable grummets with integrated tape.

Conduit grummets
Diameter 15 - 30 mm

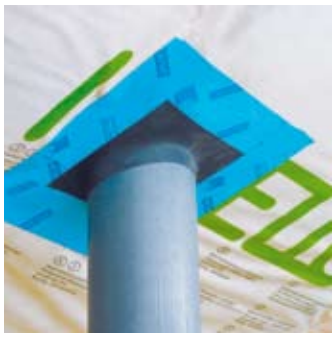


pro clima conduit grummets are the perfect solution for conduits or thick cables.

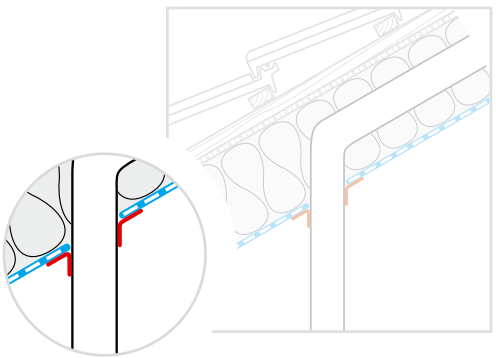
Pipe grummets small or large
Diameter 50 - 90 mm
or 100 - 120 mm



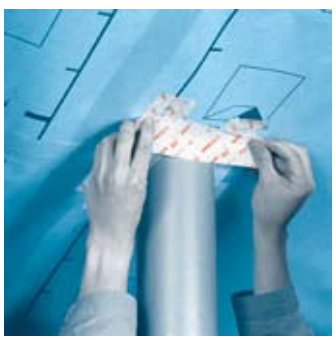
Pipes can be sealed using pro clima pipe grummets, which are available in small or large to suit the diameter of the pipe. They are joined to the airproofing layer by using one of the pro clima tapes.



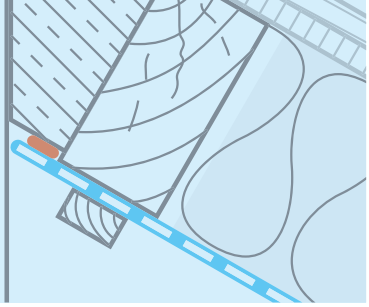
Pipe seal with ELASTO tape



Alternatively, you can seal pipes using pro clima ELASTO elasticated tape. Ensure that no tension is exerted on the bond. A tension-free joint can be achieved by using short pieces of tape.



Chimneys

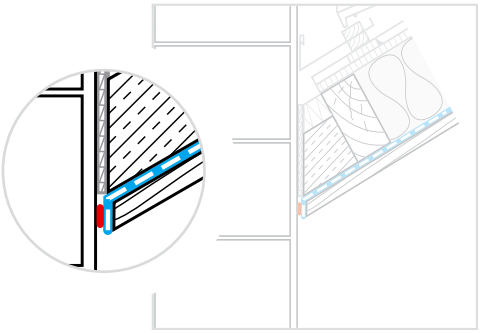


The industry standard DIN 18160 applies to joints with chimneys. This stipulates that flammable materials must not be attached directly to chimneys due to the potential risk of a chimney fire. This risk is minimal in modern chimneys due to the internal insulation fitted inside the smoke pipe. It is therefore generally possible to attach vapour checks directly to chimneys. For single-flue chimneys, however, we recommend that the stipulated distance is maintained. This can be achieved by sticking the vapour check to a cantilever slab or by using a grummet made from a fire-proof vapour check, for example aluminium foil. If necessary, please consult your local chimney sweep.

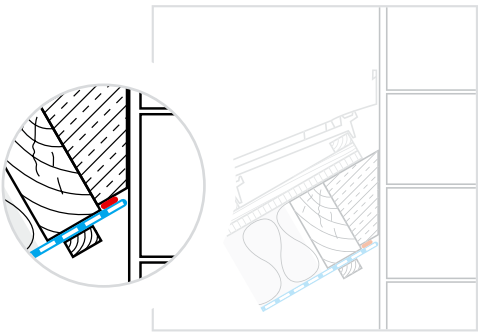
Prefabricated concrete chimneys are naturally airtight. Chimneys made of purpose-made concrete blocks (such as expanded concrete) are not, however. This means that if purpose-made blocks are not rendered, but are covered with plasterboard cladding, very large voids in the airtight seal may result, which can have a very serious impact on a building's overall airtightness.

It is therefore necessary to apply at least a thin rendering to chimneys made from concrete blocks. If the chimney is directly next to a wall then it is essential that the chimney is rendered before the bricks are laid.

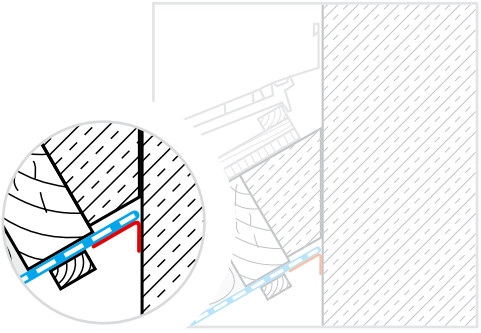
- **Prefabricated element chimneys**
- **Concrete block chimneys**



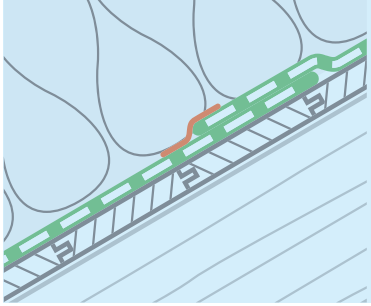
Sticking the vapour check to a rendered chimney using pro clima ORCON F.



Sticking the vapour check to a cantilever slab using pro clima ORCON F.



Sticking the vapour check to a smooth, non-porous, non-crumbling, prefabricated chimney using pro clima TESCON PROFIL.



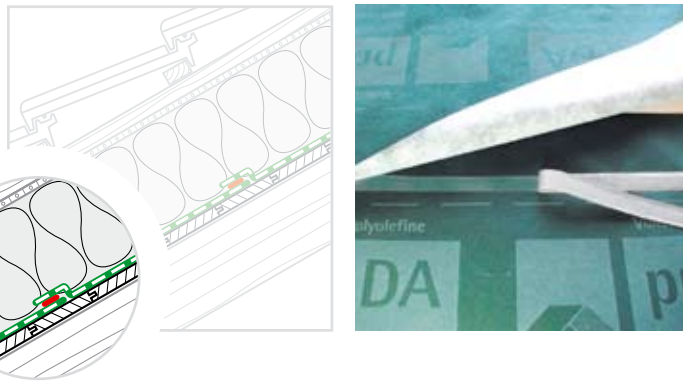
Above rafter insulation
- Sticking membrane to membrane
- Holes in the membrane

An airtight seal of the overlaps between sheets of pro clima DA can be achieved by using pro clima DUPLEX double-sided tape.
Or, alternatively, you can use single-sided pro clima BUDAX TOP.
Apply pro clima DUPLEX quickly and easily using the DUPLEX Dispenser.
For above rafter insulation it is especially important to plan the joints in the airproofing layer very carefully in advance.

It is imperative to work very carefully because it is very difficult to test the quality of the seal, for example using the pro clima WINCON, since the airproofing layer is no longer directly accessible.

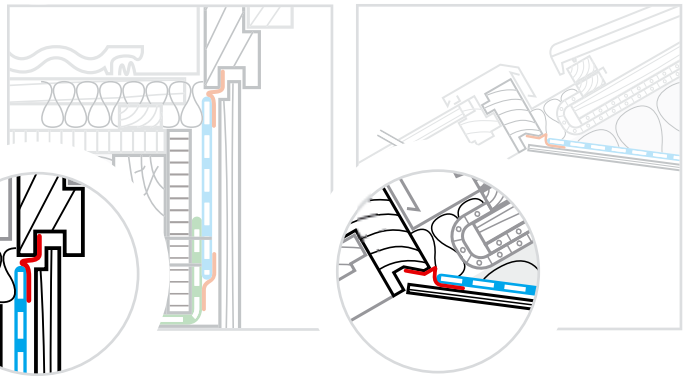
Sheet overlaps

Seal the overlaps between the sheets of DA using pro clima DUPLEX. After laying each sheet, apply the tape then lay the next sheet before removing the release paper from the tape. Alternatively, you can use ELASTO or BUDAX TOP.
Ensure all surfaces are dry.
Fix the sheets in place using staples under the overlap.



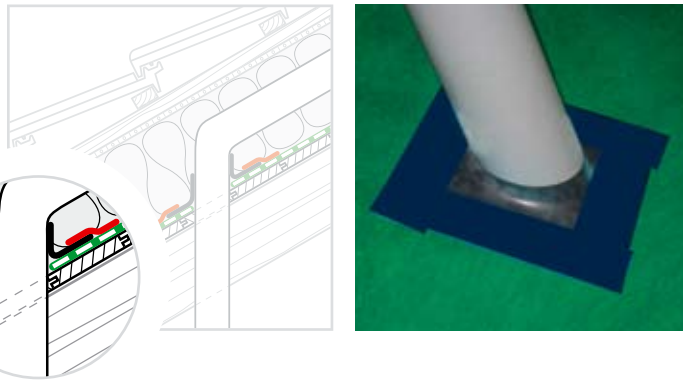
Roof windows

For sticking pro clima DA to roof windows, make sure there is sufficient excess to allow it to be stuck to the window frame with a single strip of membrane. Or you can extend the sheet with another piece of membrane to reach the window frame. We recommend pro clima TESCON PROFIL for sticking the membrane to the window frame.



Holes in the membrane

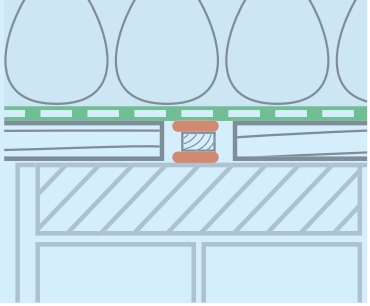
Holes in the roof lining membrane for pipes or cables can be made airtight and waterproof by using pro clima grummets. Or you can use short strips of ELASTO or BUDAX TOP to seal the joint around pipes. ELASTO and BUDAX TOP have to be applied from the bottom up to allow the water to flow away from the joint easily.

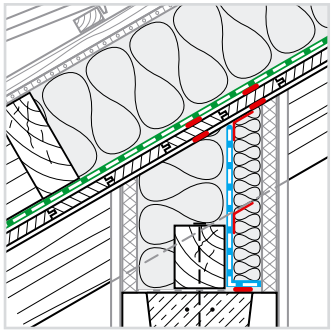


pro clima TIP

pro clima DA can be left exposed to the elements for up to 4 months during construction

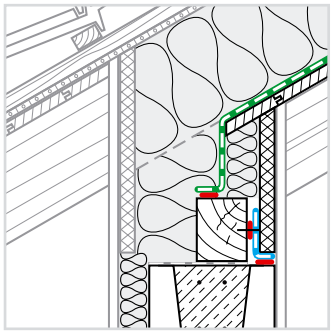
- Eaves
- Gables/verges
- Chimneys





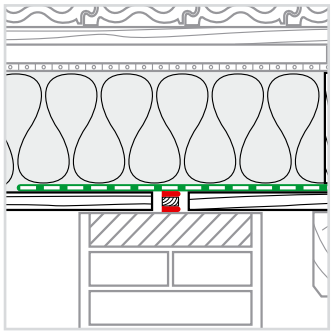
Sticking to the eaves with projecting exposed rafters

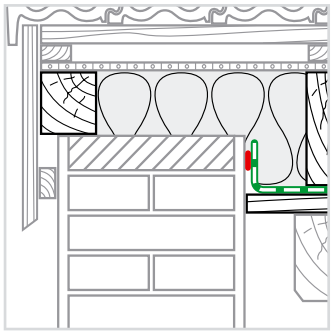
Sticking to the eaves with projecting exposed rafters.
Stick the pro clima DA to two matchboards above the sill with two parallel strips of pro clima DUPLEX or ORCON F. If the substrate is damp, only use ORCON F adhesive. Stick the boards to the rafters with two parallel strips of ORCON F, too.



Sticking to the eaves with exposed rafters ending at the sill

If the exposed rafters do not extend beyond the sill.
Stick the pro clima DA to the sill using ORCON F to create an airtight seal. If more than 20% of the thermal insulation (of the total thermal resistance) is required to be installed in front of the vapour check then a test of the permeability of the structure may be required.
Seal the joint between the sill and the tie beam using a strip of vapour check (e.g. pro clima DA-S) and ORCON F to create an airtight seal.
Alternatively, you can lay a strip of pro clima DA before positioning the exposed rafters along the sill and stick it to the tie beam using ORCON F. Once the pro clima DA has been laid between the rafters it then needs to be stuck down with ELASTO or BUDAX TOP to form an airtight seal.

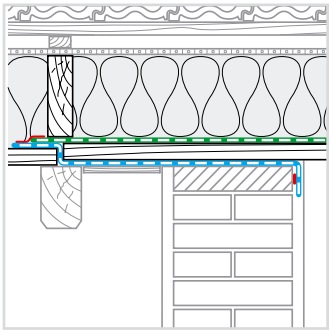


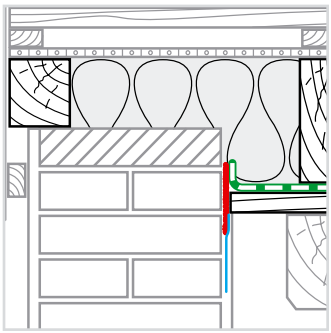


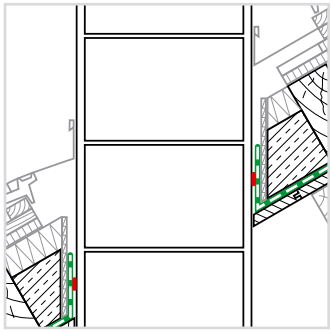
Sticking to gables/verges

Sticking to the gables/verges.
Projecting wooden roofboards can cause serious leaks. Possible solutions are:

- Interrupt the timber shell at the top of the wall. Stick a roof batten length-wise along the top of the wall using ORCON F. Stick the DA to the roof batten using ORCON F.
- Abutt the timber shell to the first verge rafter. Lay one strip of pro clima SOLITEX PLUS along the top of the wall.
- If the end wall is rendered, stick the pro clima DA to the plaster using ORCON F.
  If the wall is not rendered, stick the CONTEGA PV to the wall using joint adhesive and stick the pro clima DA to the adhesive tape. The fleece needs to be em bedded at least 1 cm in the central layer of the plaster.







Sticking to chimneys

Sticking to chimneys.
Stick the pro clima DA to the rendered chimney with an uninterrupted strip of pro clima ORCON F. Stick down any overlaps of the vapour check membrane in corners using pro clima ELASTO or BUDAX TOP.

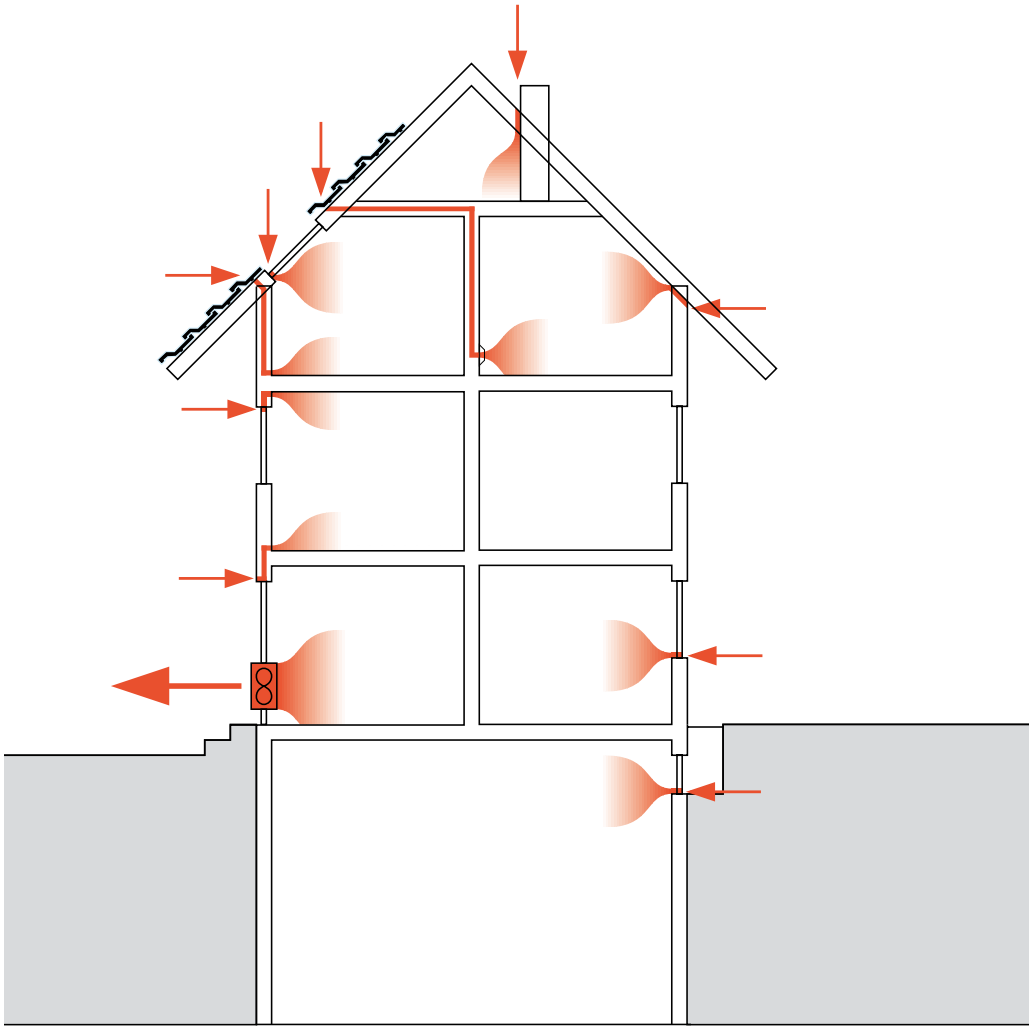
From inside, stick the vapour check to the planed wooden parts of the structure using pro clima TESCON PROFIL and to the tie beam using ORCON F.

Quality control and BLOWER DOOR testing

Testing airtightness

Quality control has long been a standard part of the manufacturing process in other trades.
For example, it is hard to imagine a plumber or heating engineer installing water or gas pipes and not testing them before commissioning them. Experience has shown that if testing does not take place, serious damage may result, since these bonds are frequently either invisible or inaccessible after rendering.
Repairing structural damage resulting from inadequate airproofing is usually between 10 and 100 times as expensive as the original construction costs.
It is therefore extremely worthwhile checking that the work has been done correctly to ensure that there are no hidden defects, since such defects may affect the health of the occupants due to mould as well as causing structural damage to the building itself.
This testing is performed using the pressure differential method, whereby a fan is installed in a door or window in order to create a partial vacuum of 50 Pa in the building. Air is then sucked into the building through any gaps in the airtightness layer.
This draught of air can be felt on the back of your hand, or can be made visible by using air flow testers (smoke puffer).
Ideally, this test should be performed before the interior lining has been installed. Then it is possible to seal the leaks immediately, while performing the test. The fact that the work is high quality and free of defects is documented by the official acceptance of the airproofing layer. This test can be performed by using the pro clima WINCON or the BLOWER DOOR .

The principle behind airtightness measurement and testing



Airtightness measurement

pro clima WINCON

The pro clima WINCON is an exceptionally high performance dedicated testing device (9800m³/h at 50 Pa pressure differential).
It does not provide an expert opinion to be reached about how airtight the building shell is, but simply tests the airtightness of the parts of the building that have been built, just like a plumber or gas engineer tests the water or gas-tightness of the pipes they have installed.
Testing is possible for full rafter insulation, but not for insulation above the rafters, although it is only possible for full rafter insulation if there are no other large openings in the building shell, i.e. once all of the windows have been installed.

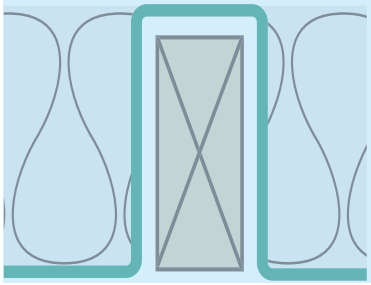
Of course, it is also possible to perform the test using a BLOWER DOOR. This has a lower fan power than the WINCON, however. Even if it isn't possible to test the airtightness of every building for practical reasons, occasional testing leads to a significant improvement in the quality of the work due to the educational effect of the tests that are carried out. This builds trust with the customer, giving you a competitive advantage.

BLOWER DOOR

The BLOWER DOOR test is performed to test the airtightness of a building after the interior lining of the building has been completed.
The principle of the test is the same as described above, except that as well as a pressure differential of 50 Pa, a defined quantity of air is also blown out of the building by the fan. If there are serious leaks, more air needs to be blown out of the building in order to attain the 50 Pa pressure differential despite the air that is being sucked into the building. If there are only minor leaks, then this amount of air is correspondingly smaller.

The volume flow of the fan is divided by the total volume of air in the building to obtain the n_{50} leakage value.
According to the applicable regulations and standards (for example EnEV, DIN 4108-7), the n_{50} value of a building has to be below 3 air changes per hour, and with controlled ventilation has to be below 1.5. The target n_{50} value for passive houses is < 0.6 (according to the recommendation of the Passive House Institute in Darmstadt, Germany).

$$n_{50} = \frac{\text{Air flow volume of the fan}}{\text{Total air volume in the building}}$$



Refurbishment of thermal insulation in

a) roofs including the replacement of roof covering
b) top ceilings below attics not used as living space

pro clima®

DASATOP
Roof reconstruction vapour check

Roll width	cm:	150	150
Roll length	m:	20	50

The humidity-variable diffusion resistance of pro clima DASATOP makes sub and top laying possible without any problems: The vapour check is laid underneath the thermal insulation and over the rafters/beams.

Under the thermal insulation DASATOP has an s_d value of up to 2 m in winter weather. On the rafters the diffusion resistance drops to 0.50 MNs/g if moisture is present. This low value is comparable to that of a modern permeable roof underlays and keeps the rafters dry. This provides ideal protection against moisture for the insulation and the rafters.

Preparatory work

Remove any sharp or pointed objects (such as nails) which are projecting out of the interior lining into the rafters, or put a firm insulating board over the lining to protect the DASATOP membrane from being damaged. The insulation thickness below the DASATOP should be no more than 25% of the total thickness.

Installation

Install the pro clima DASATOP horizontally, starting from the outer wall, at right angles to the rafters/beams. Ensure that the membrane is making full contact with the rafters/beams, the sides of the rafters and the base. The sheets should overlap by about 10 cm. The markings printed on the membrane are intended as a guide.

Sticking to the wall

Stick the DASATOP membrane to the top of the wall and the rafters or to the end wall or jamb wall and to the beams with an uninterrupted strip of ORCON F adhesive to form an airtight seal. Fill any deep irregularities or voids in the region of the joint to the wall with mortar.

Sticking to the eave plate

Stick the DASATOP to the eave plate and to the sides (or on top of) the rafters with an uninterrupted strip of ORCON F to form an airtight seal. Carefully remove any dust and prime with BUDAX AC if necessary. The eave plate should be joined to the wall below it hermetically in order to prevent a draught entering between the two.

Fixing

The DASATOP membrane should be flush with the sides of the rafters. To make sure that is does, fix it to the sides of the rafters with battens at the bottom edge of each rafter. Thin (approx. 3 mm) strips of plywood or MDF are very good for this purpose since they can easily be fixed using a power stapler. The battens used for fixing the membrane to the rafters should be between 25 and 40 cm long. A similar gap can be left between each one.

Sticking

Stick the overlaps between the sheets down using pro clima TESCON No. 1 all-purpose adhesive tape to create an airtight seal. Joints between the membrane and stony substrates such as gable walls or chimneys can be stuck using ORCON F adhesive.
To stick the sheets of membrane to roof windows use pro clima TESCON No. 1 or TESCON PROFIL. Seal any round holes using pro clima airtight grummets for cables or pipes.

pro clima
your partner for sealing your building envelope

Detail	ORCON F	RAPID CELL	UNI TAPE	TESCON No. 1	ELASTO	TESCON PROFIL	UNI TAPE XL UNI TAPE XL EASY	CONTEGA PV	cable/pipe grummets
Insulation between the rafters Overlaps between air-proofing and vapour checks									
Sealing/bonding with pro clima fleece (e.g. INTELLO®), PE, PA, aluminium foil or other vapour check [1]		■	■	■	■				
Joining structural components and pieces of pro clima fleece vapour check (e.g. INTELLO®), PE, PA, aluminium or other vapour checks to									
Rendered masonry	■								
Unrendered masonry [4]	■							■	
Planed timber	■	■	■	■	■	■			
Sawn timber	■								
Roof windows			■	■	■	■			
Rendered/internally insulated chimneys	■								
Unrendered/internally insulated chimneys [4]	■							■	
Smooth, non-porous, prefabricated concrete chimneys [4]	■		■	■	■	■			
Holes for pipes				■	■				■
Power cables [2]				■	■				■
Sealing injection holes and repairs			■	■	■		■		

Detail	RAPID CELL	UNI TAPE	TESCON No. 1	ELASTO	TESCON PROFIL	UNI TAPE XL UNI TAPE XL EASY	CONTEGA PV	DA-S-/ film strips + ORCON F	cable/pipe grummets
Sealing wood based panels (OSB, plywood, chipboard, etc.)									
Stick board joints	■	■	■	■				■	
Joining structural components and pieces of wood based panels (OSB, plywood, chipboard, etc.) to									
Rendered masonry								■	
Unrendered masonry [4]							■		
Floorboards								■	
Planed timber	■	■	■	■	■			■	
Sawn timber								■	
Roof windows	■	■	■	■	■			■	
Window/woodenframe wall	■	■	■	■	■			■	
Rendered/internally insulated chimneys								■	
Unrendered/internally insulated chimneys [4]							■	■	
Holes for pipes			■	■					■
Power cables [2]			■	■					■
Sealing injection holes and repairs		■			■				

Detail	ORCON F	TESCON No. 1	TESCON PROFIL	ELASTO	DUPLEX	CONTEGA PV	BUDAX TOP 60 / 75 / 150 mm	BUDAX AC pretreat-ment	cable/pipe grummets
Insulation above the rafters using pro clima DA Overlaps between sheets of pro clima DA vapour check									
Seal/bond between overlapping sheets		■		■	■		■		
Joining structural components and pieces of pro clima DA to									
Rendered masonry	■								
Unrendered masonry [4]	■					■			
Planed timber	■		■	■	■				
Sawn timber	■								
Roof window (inside)			■	■	■				
Rendered/internally insulated chimneys	■						■ →	■	
Unrendered/internally insulated chimneys [4]	■					■			
Holes for pipes [3]		■		■			■		■

Detail	ORCON F	TESCON No. 1	TESCON PROFIL	ELASTO	DUPLEX	CONTEGA PV	BUDAX TOP 60 / 75 / 150 mm	BUDAX AC pretreat-ment	cable/pipe grummets
Roof renovation with pro clima DASATOP Overlaps between sheets of pro clima DASATOP vapour check									
Seal/bond with pro clima DASATOP		■		■					
Joining structural components and pieces of DASATOP to									
Rendered masonry	■							■	
Unrendered masonry [4]	■					■			
Planed timber	■		■	■	■				
Sawn timber	■								
Roof window (inside)			■	■	■				
Rendered/internally insulated chimneys	■						■ →	■	
Unrendered/internally insulated chimneys [4]	■					■			
Holes for pipes [3]		■		■			■		■

(1)
In specific cases involving complex or demanding structures, such as structural components that are sealed with impermeable layers both inside and outside, please consult the ecological building systems technical hotline to discuss the most suitable adhesive tape to use for your application. The membrane may need to be tested for suitability.

(2)
When sealing power cables with pro clima adhesive tape, ensure that no tension is exerted on the cable, as any tension may cause the tape to come away from the cable.

(3)
When sealing holes using pipe grummets which are exposed to the elements for any length of time, seal the joint with the pro clima DA or DASATOP membrane using TESCON No. 1 or, if sticking it to wood based panels, BUDAX TOP and BUDAX AC.

(4)
An airtight seal with fleece (e.g. INTELLO®) PE, PA or aluminium foil vapour checks can be achieved using ORCON F. Airproofing of the wall is achieved by rendering.

Key: ■ recommended ■ alternative ■ required

www.ecologicalbuildingsystems.com

www.proclima.com

This application matrix gives pro clima's recommendations for bonding at the time of going to press. Current recommendations can be found on www.proclima.de or be obtained by calling the Hotline on: +49 (0)62 02 – 27 82 45 – Last updated: 11/2005

A task for our generation

pro clima®

The rapid global warming demands that we reduce our CO_2 emissions in order to avoid even greater environmental disasters. Hurricanes, cyclones and tornados act as pressure-relief valves to counteract the rise in temperature of our atmosphere. They suck warm air up from the surface and transport it to higher layers of the atmosphere, where the heat that has accumulated on earth can be released into space. The warmer the earth becomes, the more violent these pressure releases become. The earth itself isn't at risk, but human civilisation is, in other words, our houses and the basics on which our lives depend. A key element of human civilisation is our consciousness – consciousness not only of ourselves but also of our environment, nature and its amazing diversity.

Consciousness can be stimulated in both easy and hard ways. Feeling the consequences of the greenhouse effect is learning the hard way.
Droughts, floods and storms, and failed harvests cause suffering for millions of humans and animals.
Cutting CO_2 emissions is the easy way. We can either cut CO_2 emissions by imposing limits or by implementing intelligent solutions. For the building trade this means we can either cut CO_2 emissions by building much smaller houses than in the past, or by building houses, which use less energy thanks to careful planning and execution.

According to a study into energy consumption, a house with 80 m^2 of floor space with poor insulation uses as much energy for heating as a house with about 400 m^2 of floor space with completely airtight insulation, but with the same thickness of thermal insulation (see page 2).
Only by implementing intelligent solutions consistently and consciously will we be able to ensure a high quality of life for a all people on our planet.

A task for our generation

SERVICE

For more information:

- STUDY

  Calculation Potential Freedom from Structural Damage of Thermal Insulation Structures in Timber-Built Systems

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