# HAMM Principles

THE BALANCE OF HEAT, AIR & MOISTURE MOVEMENT IN BUILDINGS

A HOLISTIC APPROACH TO A HEALTHY BUILDING ENVELOPE



Heat | Air | Moisture Movement

System Solution Providers

Proctor Group



# A. Proctor Group

## Experts in membrane systems

**For any building to have an energy efficient, healthy, moisture free building envelope there is a clear need to manage the balance of Heat, Air and Moisture movement (HAMM) throughout the building's life cycle from design, construction, completion and use.**

Understanding the importance of these key elements on the building envelope is crucial to the successful construction and operation of a building. Architects, designers, and building product manufacturers must seek to ensure that they fully understand the science behind our buildings, managing the external and internal forces which impact on the quality of the completed building, its performance in use, as well as the health of its occupants and the wider environment.

Our portfolio of specialist vapour and airtight membranes, combined with our extensive technical expertise, ensure that the correct balance of Heat, Air & Moisture Movement is achieved via the building envelope. Our patented externally applied airtight membrane system, Wraptite, offers commercial construction providers the ability to reliably and comfortably exceed current airtightness requirements.

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- Fireshield®
- FramePro® W1

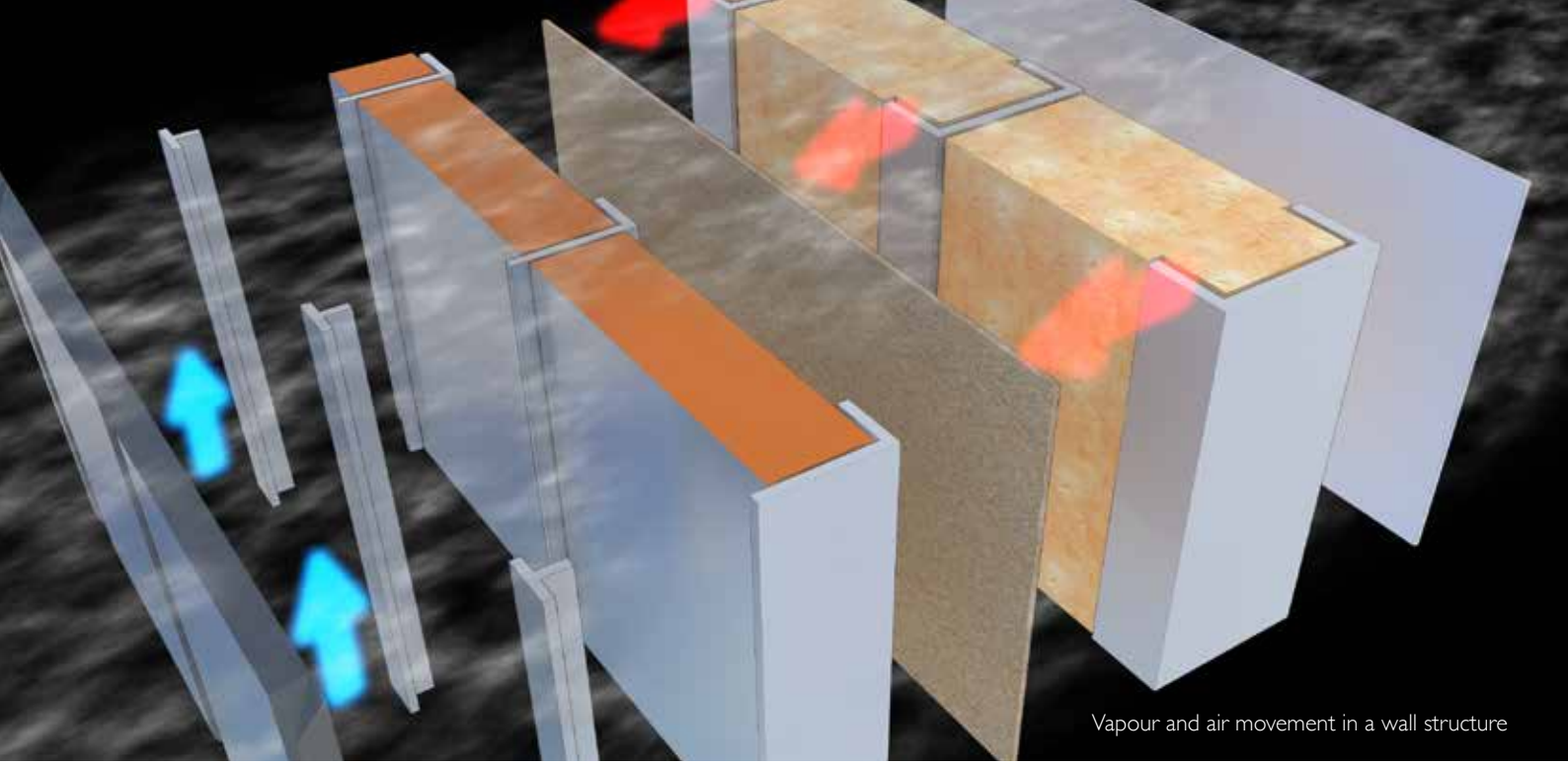
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*Revised: Feb 2026 Version: 1.036 Next review due: Feb 2027*



Vapour and air movement in a wall structure

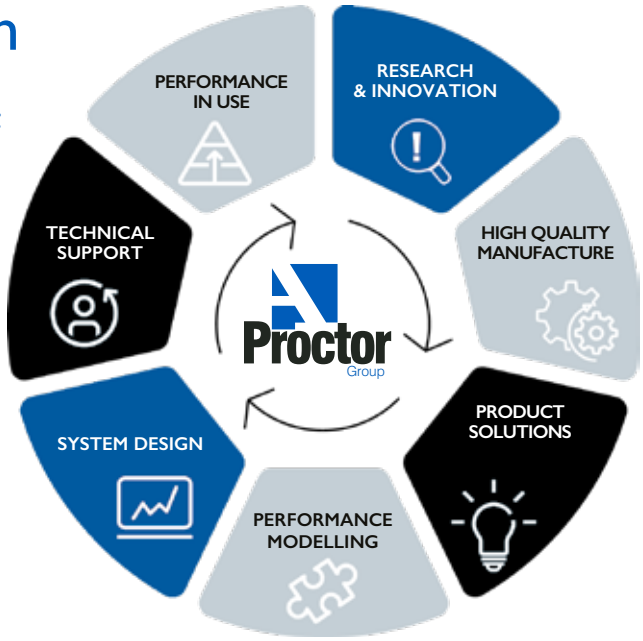
# Total Solution Capabilities

Our products are backed up by a dedicated team of technical experts, able to assist at every project stage from pre-planning to on site. We offer CAD detail reviews, installation guidance, condensation risk analysis, WUFi calculations, U-Value calculations, ground gas system designs, telephone support & more. Our products also have a range of BIM Objects & Performance Specifications.

# From concept to completion

## In doing so, we consider six core aspects in the process:

- Research & innovation
- High quality manufacture
- Product solutions
- Performance modelling
- System design
- Technical support
- Performance in use



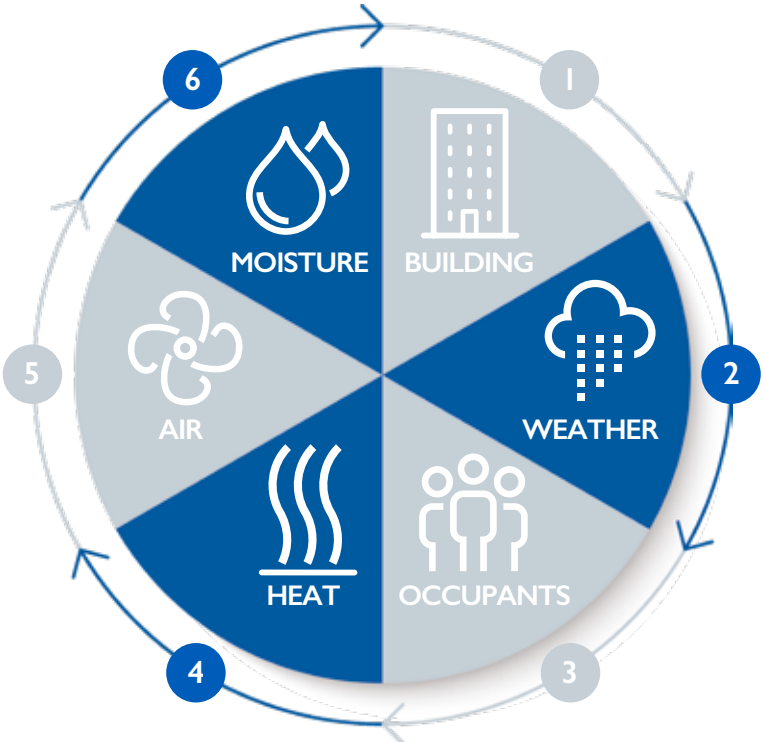
# Heat, Air & Moisture Management (HAMM) in building design

Based upon over 50 years of providing solutions and products for the construction sector we understand that a totally holistic approach is required to building design. This is equally essential in the design, manufacture, assembly and construction of buildings. In doing so, we consider six core aspects in the process:

- Building
- Weather
- Occupants
- Heat
- Air
- Moisture

For any building to be an energy efficient, healthy, moisture free building envelope there is a clear need to manage the balance of Heat, Air and Moisture movement throughout the process of the building's life cycle from design, construction, completion and use.

Understanding the importance of these key elements upon the building envelope is crucial to the successful design, construction and operation of a building.








# Building Regulations - designing for performance

With the increased spotlight and focus on building regulations and the suitability of materials specified for use within building construction, the correct selection and application of materials are at their most critical. The key guidance on meeting the requirements of Building Regulations for England and Wales, and Building Standards (Scotland) relating to airtightness, energy efficiency, moisture and condensation control as well as fire safety are outlined within the Approved Documents and Technical Standards below.

For specific advice on any of these please contact our technical support on 01250 872261.




## Building Regulations

- Approved Document C Site Preparation and Resistance to Contaminants and Moisture 2013
- Technical Guidance Document C Site Preparation and Resistance to Moisture (Ireland 1997) Amendments 2020
- Building Standards Section 3 Environment (Scotland 2020)
- Approved Document L - Conservation of Fuel & Power (2021 incorporating 2023 amendments)
- Technical Guidance Document L - Conservation of Fuel and Energy (Ireland 2022)
- Building Standards Section 6 Energy (Scotland 2020)
- Approved Document B Fire Safety
- Approved Document F Means of Ventilation (England & Wales)
- Technical Guidance Document F - Ventilation (Ireland 2019)

## Product & Performance Standards

- BS 5250: 2021 - Management of Moisture in Buildings. Code of Practice
- BS EN 15026:2007 Hygrothermal Performance of Building Components and Building Elements
- BS EN ISO 13788:2012 Hygrothermal performance of Building Components and Building Elements. Internal surface temperature to avoid critical surface humidity and interstitial condensation - Calculation methods.



# Building Regulations - designing for performance

*Amendment to Approved Document B: December 2022*

Guidance on how external walls can meet the Building Regulations requirement for resisting fire spread is set out in Approved Document B. Following the Independent Review of Building Regulations and Fire Safety, and subsequent Interim Report by Dame Judith Hackitt, the Government has introduced an amendment to the Approved Document B: Fire safety - which was updated in December 2022. This has a significant impact on the design and construction of relevant buildings and those over 11m/18m. Published in November 2018, the new regulations came into force on 21 December 2018.

**Use of membranes as part of the external wall construction.**
It is important to note that with specific reference to membranes the Regulation provides an exemption and further clarification is found within Regulation 7, as stated below:

- 10.21 Particular attention is drawn to the following points: a. Membranes used as part of the external wall construction should achieve a minimum classification of European Class B-s3, d0.

*In summary, the amendment stipulates significant changes to which membranes can now be used and limits these to a minimum rating of Class B-s3,d0.*





# Modelling & Analysis

## Energy Performance

Calculating the heat flows and energy performance can be achieved by using a variety of modelling tools such as U value, SAP and SBEM calculation to more sophisticated BIM models. These models can account for insulation levels, complex life cycle assessments, and allow for optimisation of the building's design.

We can provide a full range of assessment methods backed up with design guidance on compliance and improvement.

## Condensation Risk

Key guidance on assessment methods in relation to the risk of condensation in buildings is given within BS EN ISO 13788:2012. Traditionally, methods of assessment have been based on the Glaser method – a standard static interstitial moisture calculation based on average monthly temperatures, vapour pressure and steady state conduction of heat to determine if critical condensation points are reached within one year.

BS 5250: 2021 - Management of Moisture in Buildings. Code of Practice has been amended to specify the conditions when the traditional simplified Glaser modelling is not appropriate, and when more sophisticated modelling to BS EN 15026 is needed.

Hygrothermal assessment is based upon the analysis of heat; vapour and moisture transfer through the elements of a building. The data provided by this method provides an accurate measure to the temperature, relative humidity and water content within the elements of a building measured over a specified time period.

The use of hygrothermal assessment employs sophisticated computer modelling to simulate the interactions between building envelopes, building services and the use of buildings. Hygrothermal analysis will consider different climatic conditions and realistically evaluate the potential moisture levels in building components, identifying weaknesses, and thus enabling these to be corrected at the design stage.

The A. Proctor Group uses WUFI software, which is fully compatible with BS EN 15026, and dynamically predicts moisture movement and storage as well as condensation for each location.

**WUFI Analysis can help identify:**

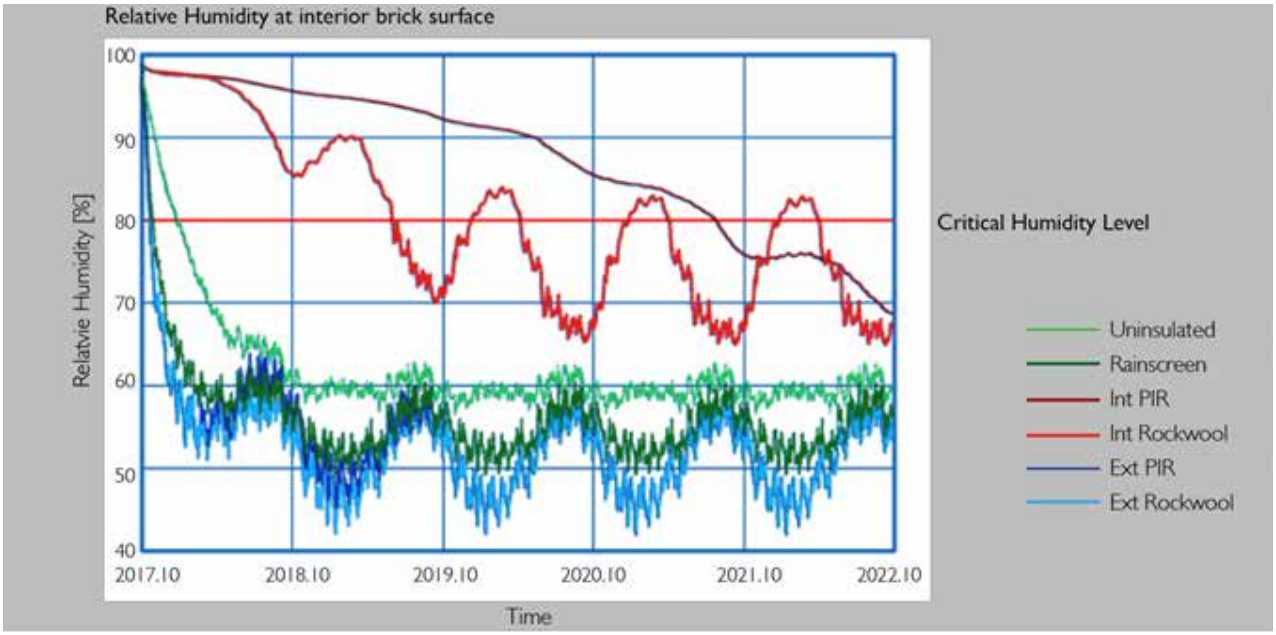
- The effectiveness of condensation control with and without a VCL
- How to achieve faster drying out times

# Typical WUFI® Calculations

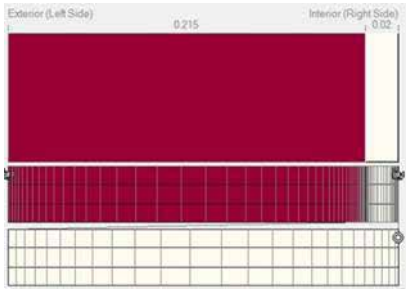
**BS 5250 explains the WUFI® calculation method (BS EN 15026) as the most appropriate method of determining the condensation risk in solid walls with internal insulation.**

Solid walls with internal insulation can be problematic because the insulation prevents internal heating from drying the brickwork, which can result in moisture and mould growth between the insulation and the wall surface.

The graph shows the results of analysis at the interior brick surface of the assemblies provided. This highlights the moisture risk with internal insulation and that external insulation would be more appropriate. It also shows that using a vapour permeable insulation internally as opposed to a vapour resistant insulation will greatly reduce the humidity at the brick surface.

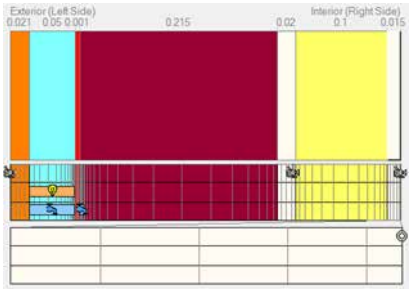



### Solid Brick Wall Uninsulated



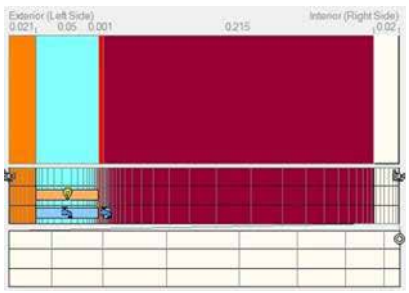
**Assembly**
215mm Solid Brick Masonry
20mm Lime Plaster

### Rainscreen Brick Wall with internal PIR /Rockwool



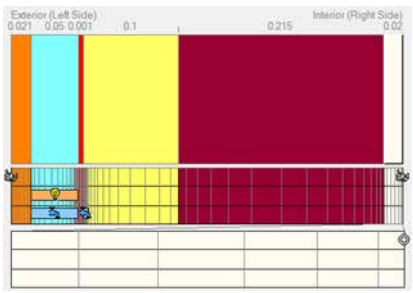
**Assembly**
21mm Timber Rainscreen
50mm Ventilated Cavity
Wraptite
215mm Solid Brick Masonry
20mm Lime Plaster
100mm Rockwool Insulation
125mm Plasterboard

### Brick Wall with Rainscreen Uninsulated



**Assembly**
21mm Timber Rainscreen
50mm Ventilated Cavity
Wraptite
215mm Solid Brick Masonry
20mm Lime Plaster

### Rainscreen Brick Wall with external PIR/Rockwool



**Assembly**
21mm Timber Rainscreen
50mm Ventilated Cavity
Wraptite
100mm Rockwool Insulation
215mm Solid Brick Masonry
20mm Lime Plaster

# Product Selector


Thermal Insulation


Airtightness


Moisture

| Application | Product | Page No. |
|---|---|---|
| **Thermal Insulation** | | |
| Spacetherm's remarkable performance is achieved through the use of flexible aerogel blankets. | • Spacetherm® Blanket | 14 |
| | • Spacetherm WL | 15 |
| | • Spacetherm A1 | 16 |
| | • Wraptherm® | 17 |
| | • Proctorwrap Reflect® | 18 |
| | • Reflectatherm Plus | 19 |
| **Airtightness** | | |
| The Wraptite membrane has been developed to provide a simple and robust solution to the challenges of reducing air leakage. | • Wraptite® | 23-24 |
| | • Wraptite UV | 25 |
| | • Probreathe® A2 | 26 |
| | • Wraptite Tape /Split Liner | 27 |
| | • Wraptite Liquid Flashing | 28 |
| | • Wraptite Corners | 28 |
| | • Wraptite FZ | 29 |
| **Moisture** | | |
| Our technical services include condensation risk assessments for individual projects to confirm suitability of our membrane systems. | • Procheck® Adapt | 32 |
| | • Procheck VCL Range | 33 |
| | • Profoil 861 | 34 |
| | • Procheck® A2 | 35 |
| | • Proctor Air® | 36 |
| | • Façadeshield® UV | 37 |
| | • Probreathe® A2 Air | 38 |
| | • Fireshield® | 39 |
| | • FramePro® W1 | 40 |

# Thermal Insulation



## Thermal Insulation - managing heat flow

Depending on climate and location “heat” is keeping heat in or keeping heat out, therefore when we are considering heat we are mainly concerned with thermal insulation. The effects of heat flow can have a significant impact on the energy efficiency of a building. Managing energy efficiency from design to construction is increasingly important.



# Thermal Insulation –
## Designing for energy efficiency in buildings

### Heat (Thermal insulation and airtightness)

Depending on climate and location "heat" is keeping the heat in or keeping heat out, therefore when we are considering heat we are mainly concerned with thermal insulation. The effects of heat flow can have a significant impact on the energy efficiency of a building. Managing energy efficiency from design to construction is increasingly important.

### The Impact of Heat Flow

To maximise the design of a building's energy efficiency a holistic approach is required to provide a total system which fully embraces the principles of HAMM, considering an integrated approach to airtightness and condensation control. An incorrect specification or installation of effective thermal barriers will lead to unmanaged heat loss, impacting directly on the energy efficiency of the building and its systems. In recent years, schemes by the UK and European governments have sought to improve the energy efficiency of buildings, driven by the need to reduce carbon emissions and energy costs. In many cases, insulation has been a "silver bullet" to address these needs. However, whilst insulation has a key part to play, the most effective solutions will demand a total system approach from the outset.

### Product Range

- Spacetherm
- Spacetherm WL
- Spacetherm A1
- Wraptherm
- Proctorwrap Reflect
- Reflectatherm Plus

# Thermal Insulation –
## Designing for energy efficiency in buildings

### Thermal insulation

**Architects, designers and developers involved with the construction of new build dwellings and the refurbishment, conversion or extension of existing dwellings will be required to comply with Part L of the Building Regulations (England & Wales), and Building Standards Section 6 Energy (Scotland 2020).**

Effective insulation systems will take into account U-values, air permeability, and moisture management. The U-value quantifies the rate of heat loss through a building element such as walls, roof, windows and doors. The lower the U-value is the slower the heat generated by heating systems will escape from the building, and the less energy input will be needed to maintain a comfortable internal temperature.

To improve the u-value of a given element, we might add thermal insulation board or blankets to the walls to keep the heat in. The thickness of a specific material has thermal resistance, and to work out a u-value we add all the R-values in our wall together and take the inverse of the result. Because this is an inverse, the more insulation we add, the more we need to add to improve the u-value further.

Not all materials insulate equally well, and to define this, we use a value called the thermal conductivity or lambda value. Materials like bricks or metal have high thermal conductivity, while insulation materials, like mineral wool or rigid foams, has far lower conductivity. The thermal conductivity of a material is usually independent of the thickness.

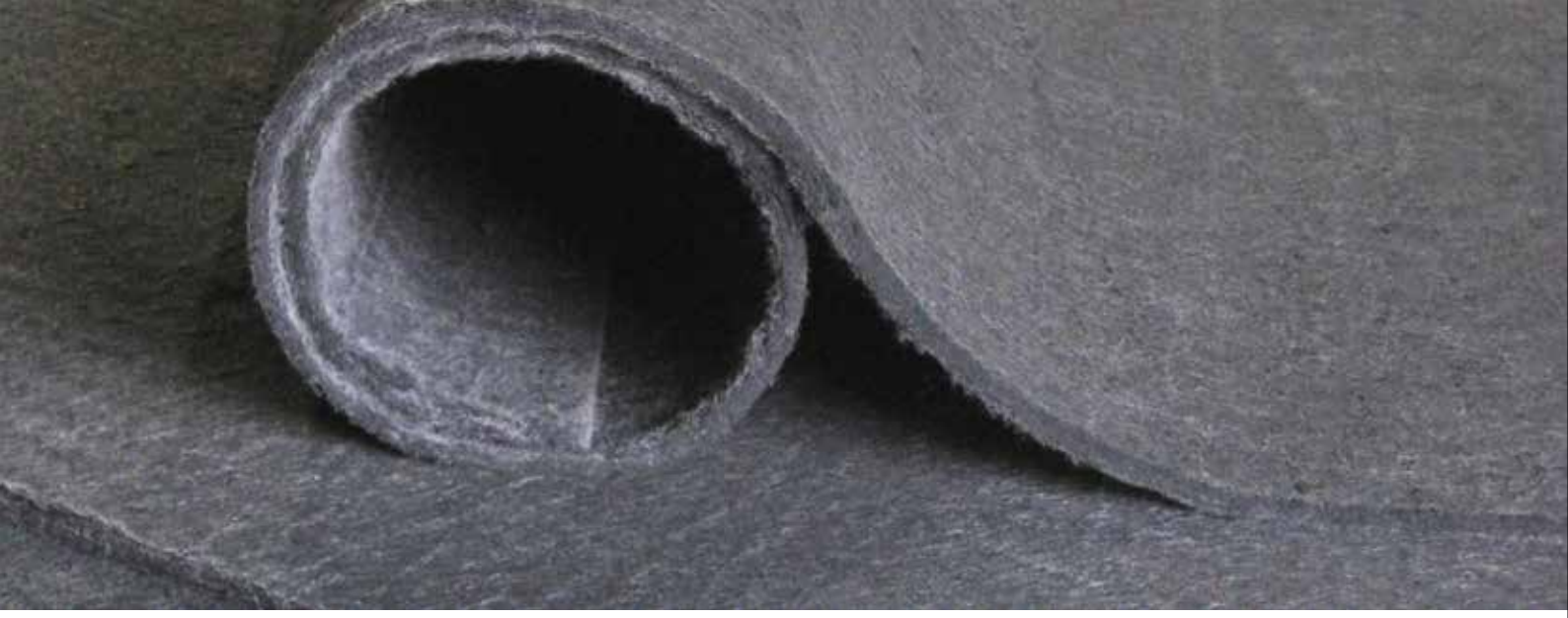


We can now take the thicknesses of our materials and divide these by their thermal conductivity to get R-values. Adding the R-values together and taking an inverse provides us with the U-value. This is then adjusted for any penetrations like structural elements, called repeating thermal bridges, any fixings or air gaps present, to give us a final U-value for the element.

Taking all our u-values, and weighting them by area, we can derive an overall average for the entire building. We then adjust this to account for non-repeating thermal bridges like corner junctions, floor zones etc, and end up with our complete heat loss model.

Modern new build homes typically have wall u-values of around 0.2 W/m$^2$K (watts per metre squared kelvin) while traditional older properties with solid walls will be more like 2 W/m$^2$K, an order of magnitude worse, which will have a significant effect on both the heating bills of the property and the quality of life of the occupants. This is especially true where occupants are considered to be in fuel poverty or belong to a particularly vulnerable social group such as the elderly. In such groups, poor thermal insulation can lead to a variety of health problems so it's important that upgrading such homes is considered a priority.





# SPACETHERM® BLANKET

**The ongoing issue of hard - to - treat walls in the UK can be overcome utilising Spacetherm - an ultra - thin insulation for thermal upgrades, saving valuable space without altering the exterior fabric of the building. Spacetherm can be supplied on its own and cut to size or laminated to a number of facings to suit your individual requirements. Its remarkable performance is achieved through the use of flexible aerogel blankets. The insulation used in Spacetherm is material derived from silica gel.**

The Spacetherm Blanket consists of unfaced sheets of aerogel composite insulation. The possible applications of the Spacetherm Blanket are virtually limitless as it has been used in doors, shutters, window reveals, boats, swimming pool covers and numerous other applications where thermal performance, space and thickness are critical. Its flexibility and ease of use has proven it as the insulation material of choice in many applications and for a wide variety of clients.

| Property | Test Method | Mean Results |
|---|---|---|
| Blanket size | - | 2400 x 1200mm<br>1200 x 1200mm |
| Thickness | - | 5mm / 10mm |
| Density | - | 0.15 g/cm$^3$ |
| Weight | - | 0.745 - 1.56 kg/m$^2$ |
| Thermal Conductivity | - | 0.015W/mK |
| Water Vapour Permeability, μ-Value | - | 5 |
| Reaction to fire | - | C - sl - d0 |
| Specific Heat Capacity | - | 1kJ / kgK |

## Key Benefits

- Thin insulation system for hard to treat walls
- Class leading performance
- Minimum loss of room space
- 50 year continued thermal performance
- Direct fix to solid walls
- Non-hazardous material

## Product range

- Spacetherm Multi
- Spacetherm Wallboard
- Spacetherm Directfix
- Spacetherm Cold Bridge Strip
- Spacetherm Window Reveal Board

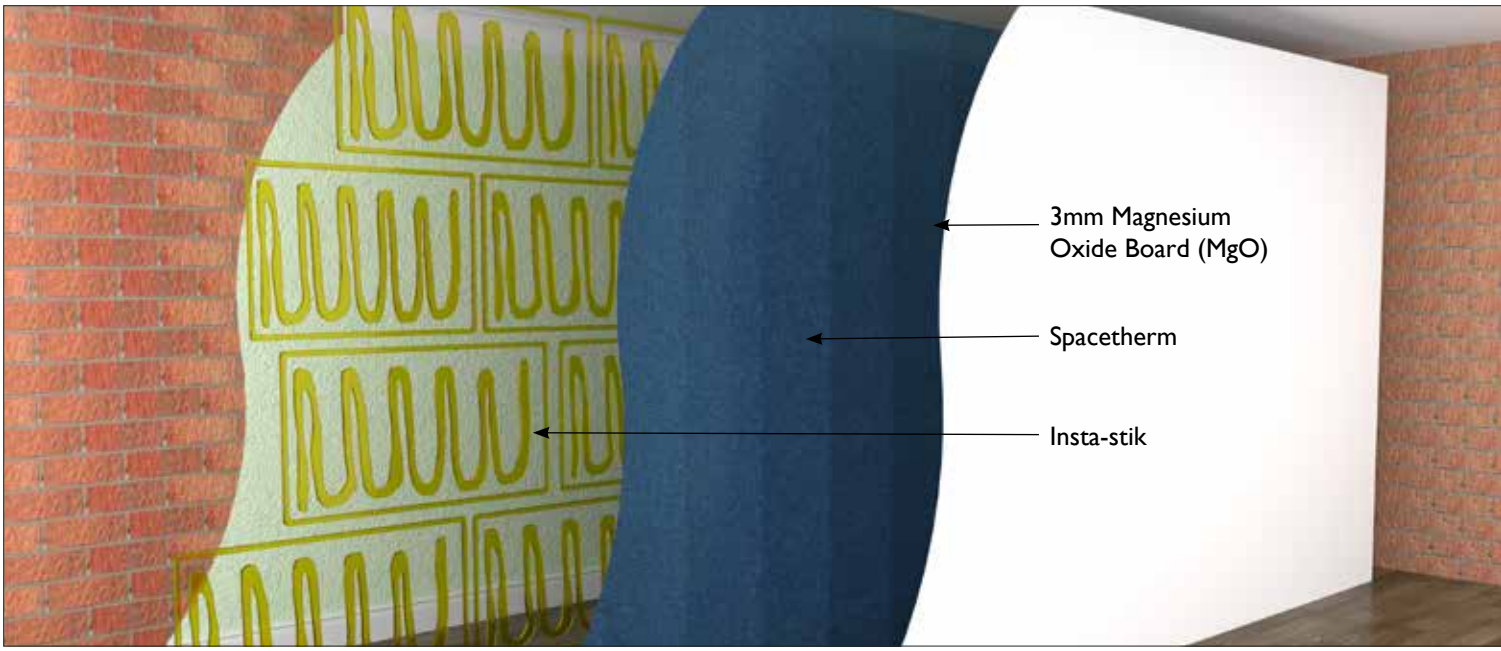
*More details on the product range can be found on our website.*

# SPACETHERM® WL

Spacetherm WL (Wall Liner) is an internal thin insulation system for hard to treat walls and is specifically designed to be installed to internal surfaces of existing solid walls without the need for mechanical fixings. Spacetherm WL, which overall thickness is 13mm, consists of 10mm Spacetherm Aerogel insulation blanket bonded to 3mm Magnesium Oxide Board (MgO). Spacetherm WL is a non-hazardous material for use in applications where improved thermal performance is required with limited space. Spacetherm WL can achieve similar performance to traditional plasterboard laminates, but at a fraction of the thickness, allowing specifiers greater flexibility and higher performance for refurbishment projects.

With a low thermal conductivity of 0.015 W/mK, Spacetherm Aerogel's low thermal conductivity qualifies it as one the the most thermally efficient materials available worldwide. It's constant long term thermal performace is proven to last 50 years+.

Full product data and details available to download at www.proctorgroup.com.




| Property | Test Method | Mean Results |
|---|---|---|
| Dimensions | - | 1200 x 595mm |
| Thickness | - | 13mm (10mm Aerogel + 3mm MgO) |
| Weight | - | 4.9 kg/m² |
| Reaction to Fire | - | Aerogel (Class C-s1, d0) Magnesium Oxide board (Class A1) |
| Thermal Conductivity | - | Aerogel 0.015 W/mK Magnesium Oxide board 0.19 W/mK |
| Vapour Permeability | - | Aerogel Sd 0.05m Magnesium Oxide board Sd 0.062m |

## Key Benefits

- Minimum loss of room space
- Ideal for window reveals, skirtings and cornices
- Allows wall to breathe
- Designed for the refurbishment market
- No specialist trades required
- No mechanical fixings
- Reduced cold bridging



# SPACETHERM® A1

**Spacetherm A1 is a flexible, silica aerogel-based insulation material of limited combustibility used for exterior and interior applications. The product is used to optimise the thermal performance and fire properties of façade systems in a number of ways. These include enhancing the thermal performance of the ventilated façade, and addressing thermal bridging in the façade. Spacetherm A1 is also useful in minimising thermal bridges around windows in areas such as window reveals and roller shutter cases.**

Spacetherm Aerogel's low thermal conductivity qualifies it as one the the most thermally efficient materials available worldwide. Engineered for space-critical applications, the product offers superior compression strength, plus breathability allied to hydrophobic characteristics.

## Key Benefits

- Reaction to Fire A1 non-combustible
- Non-combustibility
- Water vapour diffusion open
- Permeable
- Flexible
- Thinnest aerogel insulation available

*For specific details please contact technical for further information.*

*Please note, only the Spacetherm A1 material is fire rated - for any components laminated to this product, it will no longer achieve this.*

# WRAPTHERM®

Wraptherm is a composite comprising 10mm Spacetherm Aerogel Insulation blanket bonded to the face of Wraptite® vapour permeable, airtight self-adhesive membrane. Use of Wraptherm provides improved airtightness levels combined with a reduction in thermal bridging. Wraptherm was developed for use in the refurbishment of existing buildings where there was a requirement to enhance both the thermal and airtightness performance of the building but can also be used in new build. Wraptherm can be applied to the internal face of the existing façade, providing a vapour neutral yet airtight layer, fully self-adhered to the substrate layer with the added benefit of a 10mm thick layer of Spacetherm insulation. Over this airtight/thermal composite, framing can be installed with the cold bridging being reduced thanks to the Spacetherm layer. Additional thermal insulation can be included within the frame to meet the u values required for the refurbishment.

The offset nature of the Spacetherm insulation layer, over the Wraptite backing, allows simplified sealing of the joints in the panel to ensure the continuity, integrity and robustness of the airtight layer.



| Property | Test Method | Mean Results |
|---|---|---|
| Coverage | - | 2400mm x 1200mm or 1200mm x 1200mm |
| Nominal Thickness | - | 11.5mm |
| Weight | - | 2.40kg or 1.2 kg per sheet |
| Water Vapour Resistance Sd | BS EN 12086 | 0.101m |
| Water Vapour Diffusion μ | BS EN 12086 | 8.806 |
| Thermal Resistance | | 0.667 $m^2K/W$ (Insulation - membrane negligible) |

## Key Benefits

- Single product airtightness and thermal bridging solution
- Ideal for Refurbishment and Façade Retention projects
- Water resistant yet vapour permeable membrane
- Reduces thermal bridging
- Continuous airtightness seal
- Low vapour resistance




# PROCTORWRAP REFLECT®

**Proctorwrap Reflect is a water resistant, non-woven polypropylene, foil faced laminate with a patented three layer composition, providing breathability, as well as secondary protection to the building during construction. Proctorwrap Reflect is vapour permeable, has low emissivity and an enhanced foil surface designed to improve the thermal resistance of timber and steel frame structures. It has a high strength to weight ratio. The product is installed on the external face of the timber frame, foil side face out, similar to that of a traditional breather membrane but with added thermal benefits.**

Proctorwrap Reflect complies with the low vapour resistance requirements set out by TRADA and the NHBC. The existing legislation requires a breather membrane in walls to have a vapour resistance not greater than Sd 0.12m / 0.6 MNs/g. Proctorwrap Reflect has a vapour resistance of Sd 0.08m / 0.4 MNs/g.

We can provide a range of solutions, with U-values down to as low as 0.18W/m$^2$K in standard timber frame walling applications.

| Property | Test Method | Mean Results |
|---|---|---|
| | BS EN 13859-2:2010 | |
| Roll Sizes | n/a | 1.5m x 50m<br>2.7m x 100m<br>3m x 100m |
| Mass per unit area | ISO 536 | 140 +/- 5% g/m$^2$ |
| Reaction to Fire | EN 13501-1 | Class E |
| Water vapour resistance Sd | EN 12572, Condition C | 0.08 m |
| Water penetration | EN 13111:2010 | Class W2 (Before and After ageing) |
| Thermal performance (R) | | 0.71 m$^2$K/W |
| Emissivity | EN 15976 | <0.05 |

## Key Benefits

- R value 0.71.
- Competitively priced.
- Enhanced foil surface.
- Low vapour resistance - complies with TRADA and NHBC requirement.
- Water resistant.
- High strength to weight ratio.
- Improved thermal resistance.
- 1.5, 2.7 & 3 metre wide rolls.

# REFLECTATHERM® PLUS

**Reflectatherm Plus is a reflective, high resistance vapour barrier for internal walls, ceilings and floors, specifically designed to improve the thermal performance and airtightness when placed on the warm side of the insulation.**

The membrane should be installed with the foil side facing the cavity. In ceilings the product is placed between the underside of the rafters and the ceiling lining. Adjacent sheets should be lapped by 150mm and sealed with Reflectafoil Tape. Penetrations caused by services must be minimised to ensure effectiveness, and all joints need to be sealed.

Reflectatherm Plus will help meet the requirements of the ' Part L' in England and Wales and 'Section 6' in Scotland.




| Property | Test Method | Mean Results | |
|---|---|---|---|
| | BS EN 13984:2013 | | |
| Roll Size | n/a | 1.5m x 50m<br>2.7m x 100m<br>3m x 100m | |
| Mass per unit area | ISO 536 | 140 +/- 5% g/m² | |
| Reaction to Fire | EN 13501-1 | Class E | |
| Sd value | EN 1931 | >150m | |
| Resistance to water penetration | EN 13111:2010 | Class W1 | |
| Emissivity | EN 15976 | <0.05 | |
| Tensile force | EN12311-1, mod with EN 13859-2:2014 Annex A | MD 150 N/50mm | CD 140 N/50mm |
| Elongation | | MD 50% | CD 40% |
| Tearing resistance | EN 12310-1, mod with EN 13859-2:2014 | MD 180N | CD 180N |

## Key Benefits

- R value of 0.72 m²K/W when used with a minimum 19mm service cavity.
- High vapour resistance.
- Creates service void.
- Creates an unbroken vapour control layer.
- Sd Value of >150m.
- Help meet the requirements of the Part L in England and Wales, Section 6 in Scotland, and Technical Guidance Document L in Ireland.

BS EN 13967 Flexible Sheets for Waterproofing

# Airtightness



## Air Permeability & Airtightness

Air movement is important in the building envelope, both infiltration and exfiltration. We need to control interior conditioned air escaping (whether heated or cooled) and exterior air infiltrating as it puts more pressure on heating or cooling mechanisms internally.

Airtight membranes are an obvious choice in this area whether vapour open/closed or variable.

# Airtightness
# Designing for airtightness in buildings



## Air Leakage Control Strategies

As Building Regulations have imposed more stringent energy performance criteria on the building envelope, improvements have often been driven through higher standards of insulation for roofs, walls, windows and floors. In the drive for higher standards, the significance of localised areas of reduced insulation or thermal bridging leading to air leakage has become even more crucial.

Air leakage through cracks, gaps, holes and improperly sealed elements, such as doors and windows, can cause a significant reduction in the performance of even thermally insulated envelopes, in some cases reducing their effectiveness by up to 70%. As thermal insulation requirements increase, this reduction in performance is becoming a critical issue; a consensus has emerged in the industry that, discrepancies between 'as-built' and 'as designed' performance are largely attributable to uncontrolled air leakage. Architects and developers are increasingly turning to air barrier membranes as an essential part of the design process in achieving the most effective means of controlling and reducing air leaks.

### Product Range

- Wraptite
- Wraptite UV
- Probreathe A2
- Wraptite Tape
- Wraptite Liquid Flashing
- Wraptite Corners
- Wraptite FZ

### Benefits of air-tight buildings

- More thermally efficient
- Reduce energy costs
- Lower $CO_2$ emissions
- Reduce interstitial condensation
- Improved performance of HVAC
- Improved health and comfort for occupants

# Designing for Airtightness in Buildings

## Air Leakage Testing

**A practical test of the extent of air leakage through a buildings fabric is an important part of ensuring "as built"performance comes as close as possible to the design performance targets. Such testing also allows contractors to identify air leakage paths within the building, allowing them to take appropriate remedial action if the design targets are not met.**

The methods governing such testing are laid out in EN13829, and are based around achieving a pressure differential between the inside of the building and the outside. The pressure differential is achieved by replacing the door with a large powered fan, and pumping air in (or out) to reach the test pressure of 50 Pascals. The volume of additional air that must be provided to maintain this pressure is then measured. The resulting figure, along with the buildings floor area is then used to arrive at the final air leakage result, which is expressed as cubic metres of air input required ($m^3$) per hour per square metre of floor area ($m^2$) to maintain a pressure differential of 50 Pascals, and is usually written as $m^3/(h.m^2)$ @ 50Pa.





*Part L in England, Wales and Northern Ireland requires a value no greater than 8 $m^3/(h.m^2)$ @ 50Pa to demonstrate compliance.*

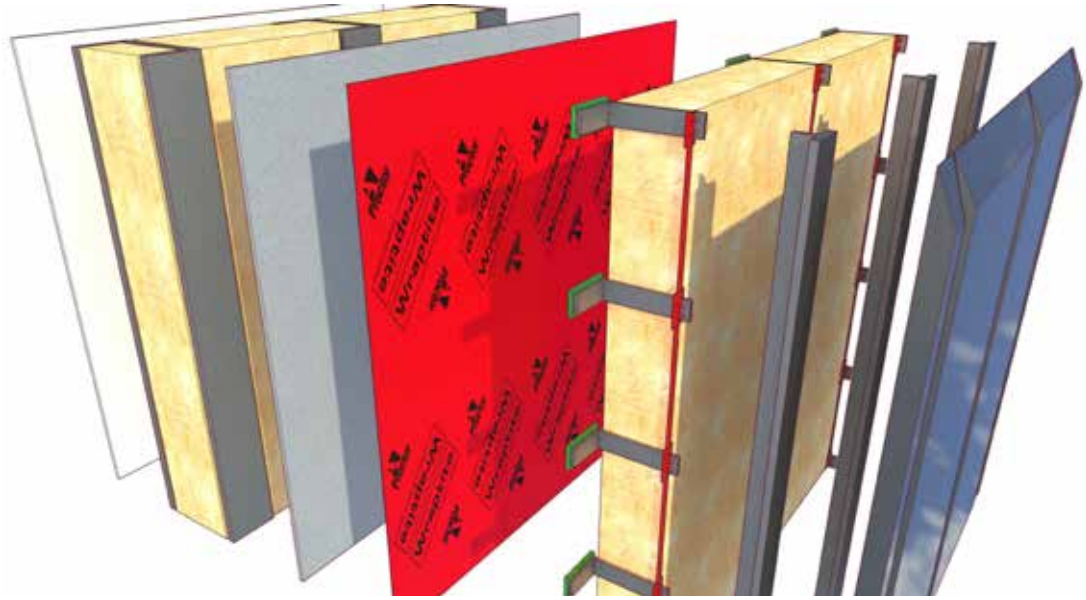
*In Scotland (Section 5) this is reduced to 7 $m^3/(h.m^2)$ @ 50Pa and in the Republic of Ireland (Part L) this is reduced to 5 $m^3/(h.m^2)$ @ 50Pa.*

*In practice, design values used are often lower than required by building regulation, making verification of compliance all the more important.*

# WRAPTITE®

**Wraptite is a patented external airtight and vapour permeable, self-adhered membrane which solves the problem of reliably achieving airtightness in buildings. Applying Wraptite to the outside of the building will mean there are fewer penetrations for services therefore the likelihood of expensive remedial work is greatly reduced. Wraptite fully bonds to virtually any substrate, with a key benefit being its speed and ease of installation, negating any requirement for sealants or tapes. This new approach saves on both the labour and material costs associated with meeting the demands of modern energy efficiency requirements in both commercial and residential buildings.**

Wraptite has received BBA certification for use in roofs, walls and modular floor construction making it an ideal choice for commercial projects with large uninterrupted façades. Its patented technology means it is the only self-adhering vapour permeable air barrier certified by the BBA. Wraptite is compliant with Part B regulation changes and also has BRE acceptance for use in the external wall systems of buildings over 18m in height, both as a continuous layer on sheathing board, behind fire classified insulation, and for use to tape joints in insulation behind rainscreen.



## Key Benefits

- Water resistant yet vapour permeable and airtight membrane
- BBA Certificate No. 15/5274
- Self adhered to avoid air bypass
- Full adhesion avoids damage during transportation of modular timer frame kits to site
- Part B compliant for relevant buildings and those over 11m/18m
- Reaction to Fire - Class B-s1,d0
- Can reduce wall thickness
- Leading airtightness performance
- Removes requirement for complex internal detailing and may negate requirement for VCL internally
- Reduces thermal by-pass
- Allows temporary protection until primary external covering
- Provides durability and reduced risk of tears and subsequent remedial work
- Patented technology
- Continuous airtight seal
- Simple detailing at junctions and corners - less EPDM required

# WRAPTITE PHYSICAL PROPERTIES

| Property | Test Method | Mean Results |
|---|---|---|
| | BS EN 13859-1/2:2010 | |
| **Roll Size** | - | 1.5m x 50m |
| **Nominal Thickness** | Calibrated Deadweight Micrometer | 0.65mm |
| **Basis Weight** | Electronic Weigh Scale | 292 g/m$^2$ |
| **Application Temperature** | - | Air & surface: minimum -10°C maximum 60°C |
| **Service Temperature** | - | -40°C to +100°C |
| **Water Penetration** | EN 1928 : 2000 Method A | Class W1 (before ageing) Class W1 (after ageing) |
| **Air Permeance** | EN 12114 | 0.01 m$^3$/m$^2$.h.50 Pa |
| **Water Vapour Resistance Sd** | Sd EN 12572 | 0.039m |
| **Water Vapour Transmission** | BS 3177:1959 | 893 g/m$^2$.24hr |
| **Peel Adhesion** | EN 1939 | 5.01 N/10mm |
| **Tensile Strength** | EN 12311-1 | Mean MD 417N Mean XD 252N |
| **Tear Resistance** | EN 12310-1 | Mean MD 412N Mean XD 286N |
| **Reaction to Fire** | EN 11925-2 BS EN 13501-1 | Class B-s1,d0[1,2] |

*[1]tested over 12mm calcium silicate board / fibre cement board as per BS EN 13238:2010.*

*[2]free hanging. It is unlikely that any breathable membrane in this application, including Wraptite would be free hanging due to either the self-adhered backing in Wraptite or the tapes used in installing non-self-adhered membranes. This test result is included to allow product specifiers to objectively compare Wraptite to other membranes tested using this method, and does not constitute a recommendation that Wraptite is installed free-hanging. Clients are urged to discuss their individual project with the Technical Department to ensure the suitability for any given project taking into account substrate, building height and boundary proximity.*

*All tests carried out to EN 13859-2:2010 standard.*

# WRAPTITE® UV

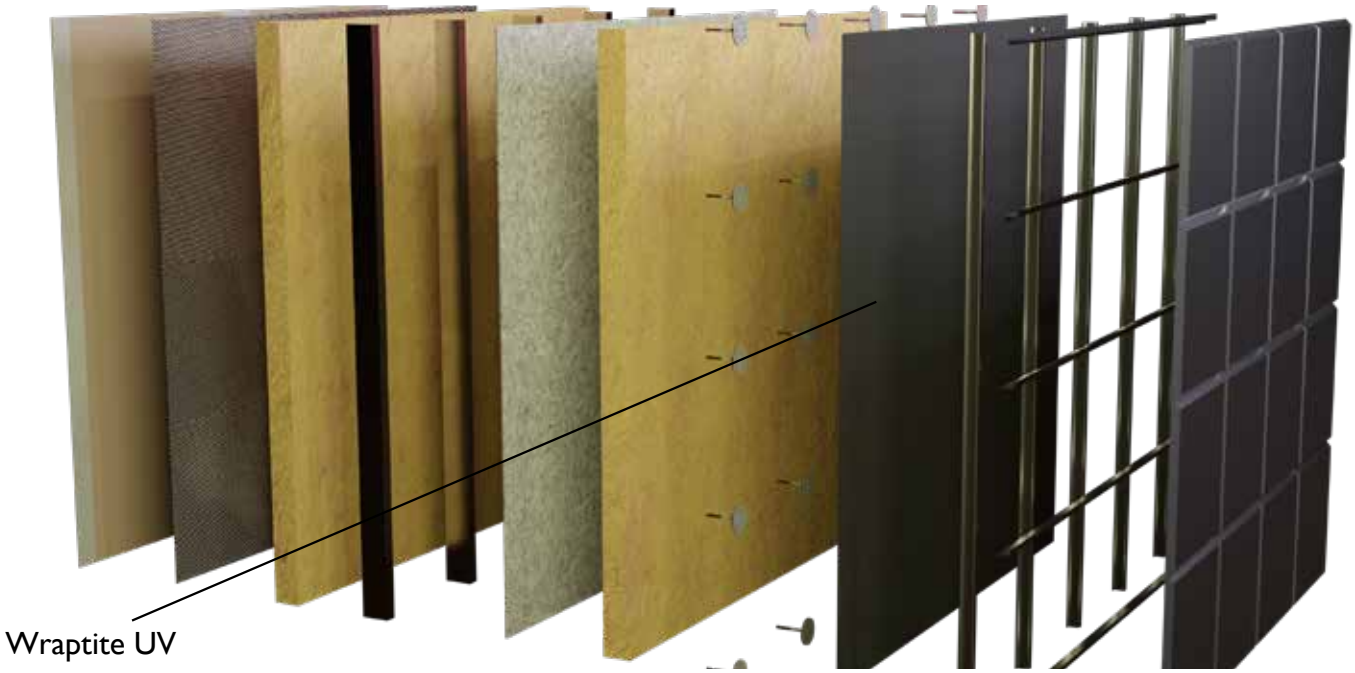
**Wraptite UV is a Class B-s2,d0 fire rated membrane that combines the properties of vapour permeability and air tightness in one innovative, self-adhering product, which is specifically designed for use behind open jointed cladding.**

Wraptite UV has water resistance and UV resistance to provide a "shadow" appearance within open rainscreen façades.

Wraptite UV bonds (no mechanical attachment) to multiple substrates for air tightness and ease of installation, negating the requirement for a primer, sealants or tapes. Adhesive curing time is approximately 6hrs depending on environmental conditions.

Wraptite UV prevents lateral air movement enhancing the buildings thermal performance. With a rating of Sd 0.06m it provides a high vapour permeability in a commercial quality, self-adhered, airtight breathable membrane.

To protect the membrane from mechanical damage, the joint openings in the façade covering have to be less than 40% of the area, and maximum 50mm wide.




| Property | | Mean Results | |
|---|---|---|---|
| | | BS EN 13859-2:2010 | |
| Roll Size | | 1.5m x 50m | |
| Nominal thickness | | 0.38mm | |
| Basis Weight | | 392 g/m² (incl. liner) | |
| Water penetration | Before ageing<br>After ageing | Class W1 (before ageing)<br>Class W1 (after ageing) | |
| Water Vapour Permeability | | Sd 0.060m | |
| Tensile strength | Before ageing<br>After ageing | MD 490N/50mm<br>MD 480N/50mm | CD 330N/50mm<br>CD 310N/50mm |
| Tear resistance | | MD 327.38N<br>CD 453.38N | |
| Reaction to Fire | | Class B-s2,d0* | |
| Resistance to penetration of air | | <0.01m³/(m².h.50Pa) | |
| UV resistance uncovered | | 12 months (Climate:Central Europe) | |

*tested over 12mm calcium silicate board as per BS EN 13238:2010.

## Key Benefits

- Airtight yet vapour permeable
- No primer required
- Tough facer laminate resists punctures and tears during construction
- Manufactured rolled goods ensure consistent properties and performance
- Wide service temperature range
- Can be left exposed for up to 12 months (UK climate)

## Accessories

- Wraptite UV Tape
- Wraptite UV Tape Split Liner
- Wraptite UV Corners
- Wraptite LF

*Please see pages 28-29 for details*



# PROBREATHE® A2

Probreathe® A2 is an A-rated breather membrane with an airtight woven glass fibre membrane with a PU coating. The membrane combines breathability, water resistance and airtightness in one membrane. It has a Reaction to Fire classification of A2-s1,d0 when installed free-hanging or onto a substrate which is minimum A2-s1,d0.

| Property | Test Method | Mean Results |
|---|---|---|
| | BS EN 13859-2:2010 | |
| Roll Size | | 1.5m x 50m |
| Weight | | 230 g/m² |
| Thickness | | 0.20mm |
| Temperature range | | -36°C to 150°C |
| Water vapour resistance | EN 12572 | Sd 0.095m |
| Reaction to Fire | EN 13501-1 | A2-s1,d0<br>B-s2,d0 over timber |

## Key Benefits

- A2 Reaction to Fire Classification
- BBA Certificate No. 25/7384
- Increased airtightness over traditional breather membranes
- Vapour permeable membrane for use either directly onto sheathing or over insulation.
- Ideal for use in rainscreen/facade construction
- Suitable for use in relevant buildings and those over 11m/18m
- Allows temporary protection of the building until the primary external covering is installed

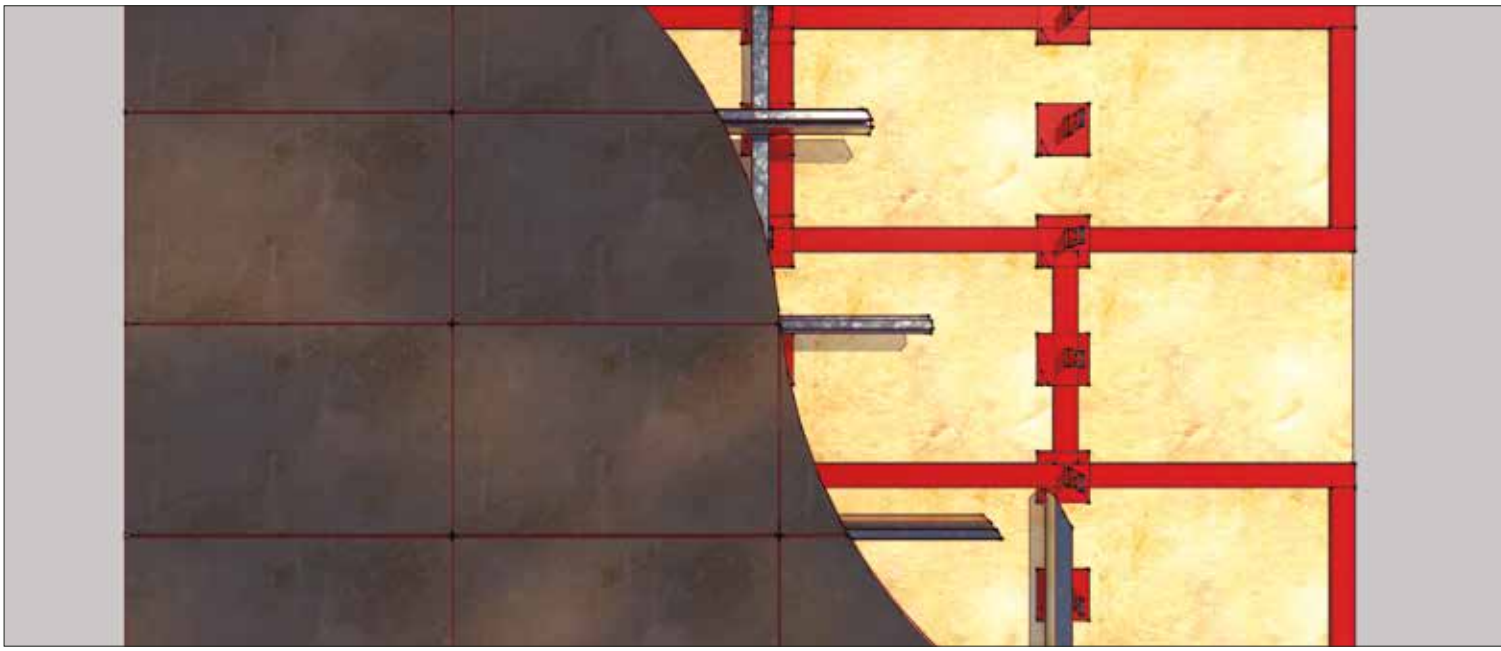
## ACCESSORIES

- Probreathe Duo Tape (50mm x 25m)
- Probreathe FR Tape (75mm x 50m)

# WRAPTITE® TAPE

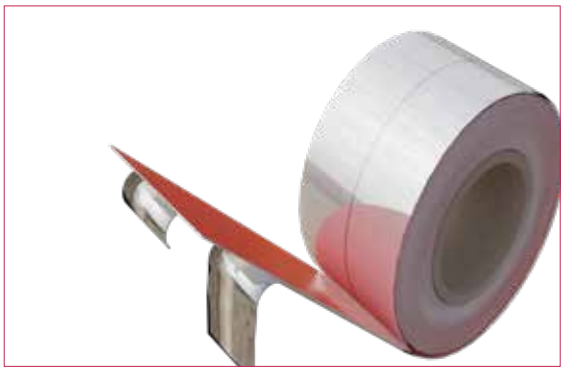
**A useful way of stopping unnecessary air leakage around openings and overlaps is to use Wraptite Tape, an airtight tape with high vapour permeability for internal and external applications. Wraptite Tape's flexibility facilitates ease of applications and detailing, while its resilient composition resists punctures and tears during construction. It can be left exposed for up to 120 days during construction and has a wide operating temperature range (-40°C to +100°C). Wraptite Tape is also available with a split release liner for ease of installation.**

It fully bonds to all standard substrates, with no primer required, suppressing air leakage around joints, openings and penetrations. It is also suitable for permanent airtight sealing of membrane overlaps and for taping insulation joints. Wraptite Tape's high vapour permeability allows damp sheathing to dry quickly and moisture vapour to escape. This ensures indoor air quality and reduces the likelihood of mould, mildew, condensation, timber distortion and metal corrosion. Wraptite Tape contains no VOC's.



# WRAPTITE® TAPE SPLIT LINER

Whilst Wraptite Tape is suitable for most applications there are some details, such as panel joints, cassette edges, complex detailing, where the benefit of a split liner is advantageous. The split liner allows one part of the Wraptite Tape to be adhered to the substrate, prior to the second portion, and can allow panels to be easily sealed on site. It can also be used for complex detailing where you need to protect part of the tape from bonding to areas until its needed. The split can be accommodated at any position across the reverse of the tape allowing flexibility of taped lap.



## Key Benefits - Wraptite Tape and Split Liner

- Vapour permeable tape used to protect exposed joints in insulation
- Airtight
- For detailing joints
- Ultimate airtightness accessory
- Can seal joints in mechanically fastened air barrier

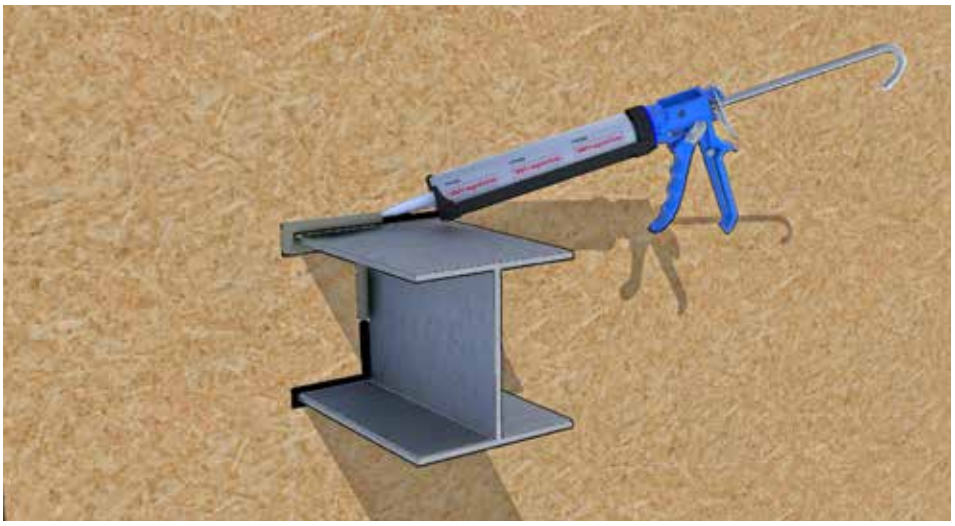
## Key Benefits - Wraptite Split Liner only

- Easier removal of backing
- Location of split can be bespoke
- Aids accurate detailing
- Maintains adhered edge until installation phase
- Easier installation non-linear application ie pipe or window flashing

# WRAPTITE® LIQUID FLASHING

**Wraptite Liquid Flashing is a high-quality, gunable, elastomeric, polyether, liquid applied flashing and detailing membrane. It bonds to most construction materials, such as aluminium, brick, concrete, wood, vinyl, and exterior sheathing boards. Wraptite Liquid Flashing is compatible with our entire range of vapour permeable products for joint detailing in exterior sheathing panels.**

Wraptite Liquid Flashing is ideal for use in complex details. It can also be used to protect the leading edge of the Wraptite membrane or tape from water penetration if the edge cannot be protected by overlapping in a shingle fashion.



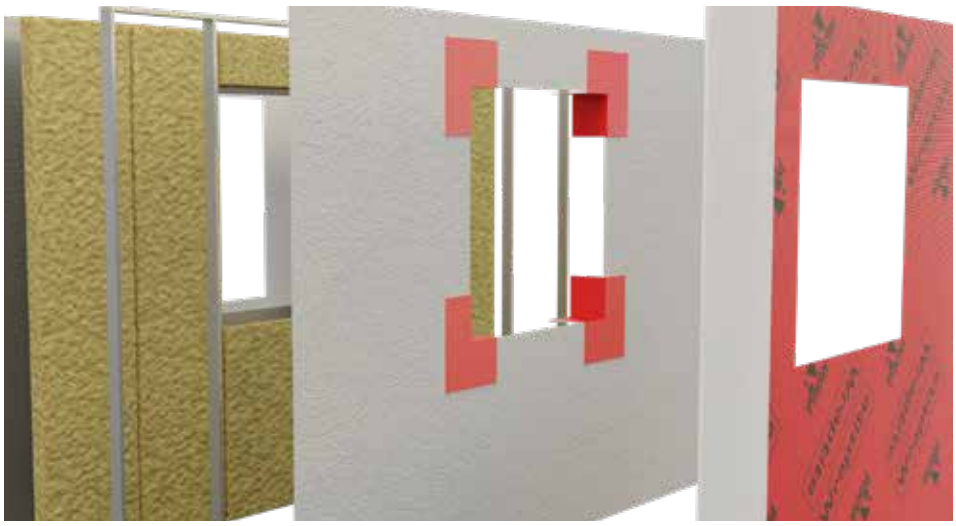
## Key Benefits

- Airtight & vapour permeable
- Continuous seal and system approach
- Can be applied in damp conditions
- Does not peel back when left exposed
- Does not create build up in rough openings
- Non-sag
- 100% solvent free
- Non-shrinking
- Bonds to most construction materials
- Simple to apply and spread
- Does not harm foam insulation

# WRAPTITE® CORNERS

**Wraptite Preformed Airtight Corners have been developed for the difficult areas around doors and windows where maintaining air barrier continuity is difficult and time consuming. Wraptite Corners' simple design and installation process makes sealing openings against air leakage simple, just peel off the release liner, stick the corners in place, then install the Wraptite membrane as normal.**

Once installed, the corner sections provide the same vapour permeable air barrier performance as the Wraptite membrane itself, ensuring air leakage and water ingress are minimised without trapping construction moisture or causing condensation.



*Colour may vary*

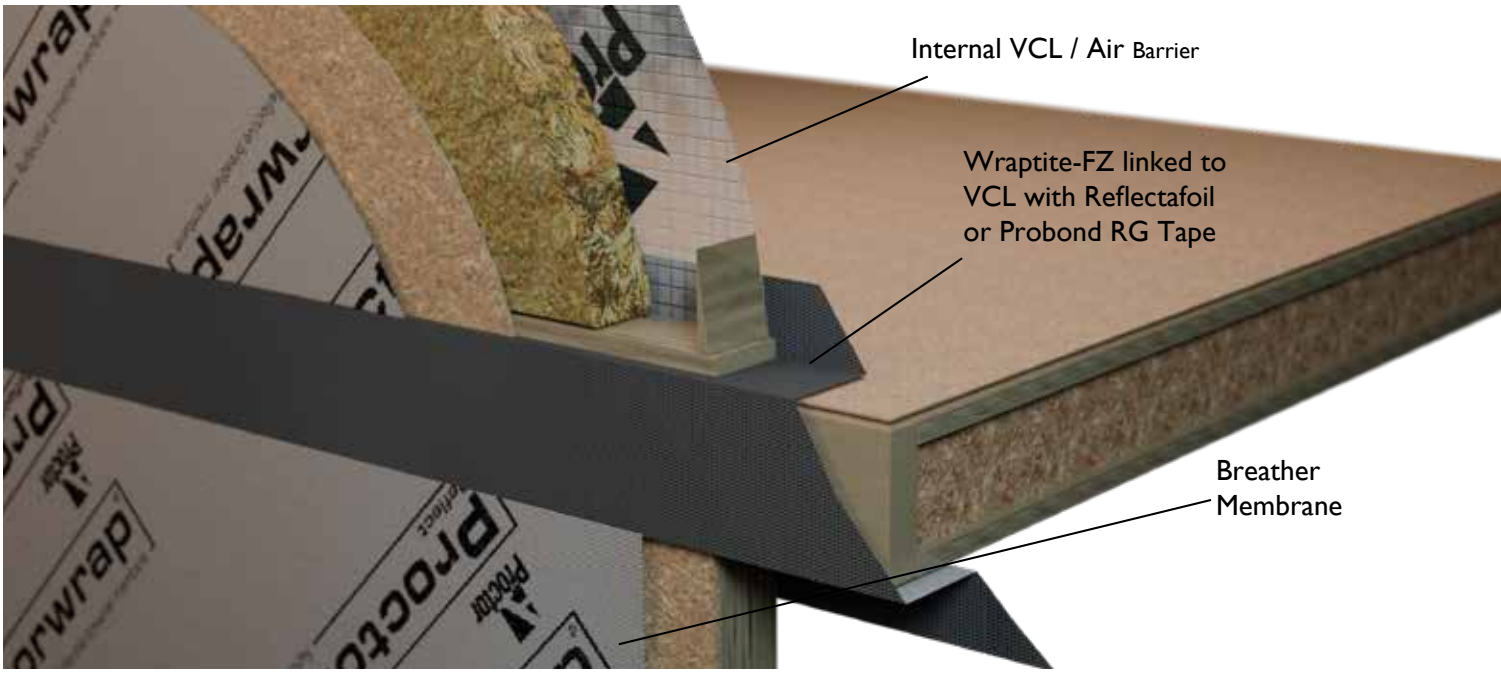
## Key Benefits

- Ensures continuity of airtightness measures
- Simplifies complex detailing
- Flexible

**Wraptite accessories are available for both Wraptite and Wraptite UV applications.**

# WRAPTITE® FZ

Wraptite FZ (Floor Zone) is a vapour permeable, airtight membrane which has a class W1 water resistance and is for use at floor junctions. It is flexible and offers temporary protection against wind driven rain, snow and dust. Wraptite-FZ is supplied in 750mm roll widths for easier site handling.




| Property | Test Method | | Mean Results | |
|---|---|---|---|---|
| | BS EN 13859-2:2010 | | | |
| Roll Size | - | | 750mm x 50m<br>1m x 50m | |
| Mass per unit area | EN 1849-2 | | 130 g/m² | |
| Reaction to fire | EN 11925-2 | | Class E | |
| Water vapour resistance | EN ISO 12572 | | Sd 0.020 m | |
| Water penetration | EN 1928 | Before ageing:<br>After ageing: | Class W1<br>Class W1 | |
| Tensile strength | EN 12311-1 | Before ageing:<br>After ageing: | MD 300 N<br>MD 340 N | CD 200N<br>CD 220 N |
| Elongation | EN 12311-1 | Before ageing:<br>After ageing: | MD 60%<br>MD 65% | CD 100%<br>CD 80% |
| Tear resistance | EN 12310-1 | | MD 120 N | CD 140 N |
| Flexibility at low temperature | EN 1109 | | ≥40°C | |

## Key Benefits

- Provides continuity of internally applied air barriers around floor zone junctions in new build developments
- Allows temporary protection to the floor zone during construction
- Reduces risk of condensation within the floor cassette

# Moisture



## Moisture - designing for condensation control in buildings

The A. Proctor Group is at the forefront of the development of vapour permeable membranes, vapour control layers and condensation control solutions for all areas of the building envelope.

Our range of membrane solutions includes Fireshield (vapour permeable walling membrane with a fireproof surface), Procheck Adapt (high performing variable resistance vapour control layer), and Proctor Air (air and vapour permeable pitched roof underlay).

# Moisture
# Designing for condensation control in buildings




## Managing moisture – effective vapour control

Moisture vapour will pass through the various layers of any construction by both convection and diffusion. The objective is to ensure, by design, that the moisture vapour can disperse to the outside atmosphere without being cooled to below dewpoint temperature, thus eliminating condensation and associated problems such as mould growth.

Controlling the moisture flow in a building is fundamental to the core principals of HAMM and maintaining the durability of the building envelope. Well managed moisture maximises energy efficiency by reducing adverse effects on fabric insulation, in addition to protecting the health and safety of the occupants.

### Product Range

- Procheck Adapt
- Procheck 125
- Procheck FR200
- Procheck 300
- Procheck 500
- Profoil 861
- Procheck A2
- Proctor Air
- Façadeshield UV
- Probreathe A2 Air
- Fireshield
- FramePro W1

### Guidance on condensation control

- Condensation risk assessments
- 'U' Value calculations
- Overcoming condensation in the roofspace




# PROCHECK® ADAPT

Procheck Adapt is a variable-permeability vapour control layer for use in a variety of commercial and residential applications. It is designed to protect the building fabric from potential risks of condensation and it will also act as an airtight barrier. Its variable permeability adapts to changes in humidity levels becoming more resistant in Winter and more permeable in Summer. This means the building fabric is protected from damaging moisture levels during cold, wet months of the year and it will allow the fabric to dry out effectively in warmer, drier months. Procheck Adapts' translucent structure eases fixing to structural frames. Procheck Adapt is a Passivhaus Certified Component, independently verified to meet the rigorous performance standards required for high-efficiency, low-energy building design.

| Property | Test Method | Mean Results |
|---|---|---|
| | BS EN 13984:2013 | |
| Roll Size | - | 1.5m x 50m |
| Weight | ISO 536 | 110 g/m² |
| Nail Tear Resistance | EN 12310-1 | MD 250N<br>CD 270N |
| Tensile Strength | EN 12311-1 | MD 350N/50mm<br>CD 280N/50mm |
| Elongation | EN 12311-1 | MD 20%<br>CD 20% |
| Vapour Resistance | EN 12572 | Sd 0.8m - 60m |
| Reaction to Fire | EN 13501-1 | Class E |
| Air Permeability | BS EN 12114:2000 | 0.00 $m^3/m^2.hr$ @ 50 Pa |

## Key Benefits

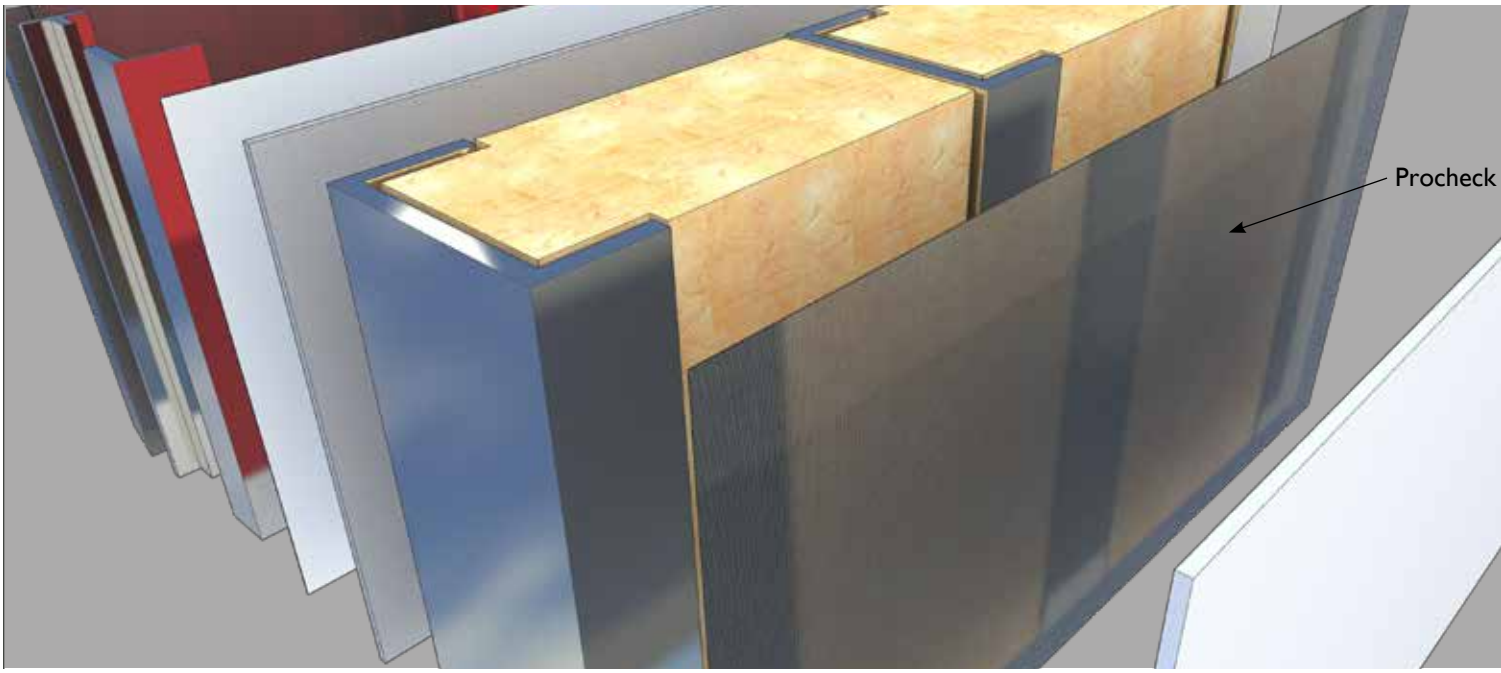
- Variable permeability adapts to changes in humidity
- Wide Sd range guarantees performance in demanding climatic conditions
- Ensures effective drying out of building materials
- Suitable for variety of commercial and residential applications
- Provides airtightness to structure as well as vapour control
- Translucent material allows for ease of installation onto framework

# PROCHECK® 125

Procheck 125 is a reinforced polyethylene vapour control layer which can be utilised in a variety of commercial applications. Procheck 125 with a vapour resistance of Sd 25m, means it can be utilised where very high moisture vapour resistance is not a necessity but a strong, airtight membrane is.

## Key Benefits

- VCL for low to medium risk applications
- Reinforced, ensuring minimal tears to withstand tough site conditions
- Translucent, allowing visibility to substructure for ease of installation




# PROCHECK® FR200

Procheck FR200 has a Reaction to Fire classification of B-s1,d0 which provides assurance of fire performance for the structure. Procheck FR200, air and vapour tight membrane improves energy efficiency and reduces the condensation risk, and has a vapour resistance of Sd 44m.

## Key Benefits

- Independent assurance of fire performance (EN 13501-1 B-s1,d0)
- Reduced condensation risk
- Reinforced

# PROCHECK® 300

Procheck 300 is a reinforced, polyethylene vapour control layer for use within roof and wall constructions to prevent warm, moist air escaping from inside the building and condensing within the insulation. The woven, polypropylene, multifilament scrim reinforcement provides resistance to tears and punctures to withstand tough site conditions and is unaffected by chlorine. Procheck 300's vapour resistance of Sd 64m makes it the ideal choice for applications such as heated warehouses, schools and shops. Its translucent colour allows visibility to the substructure.

## Key Benefits

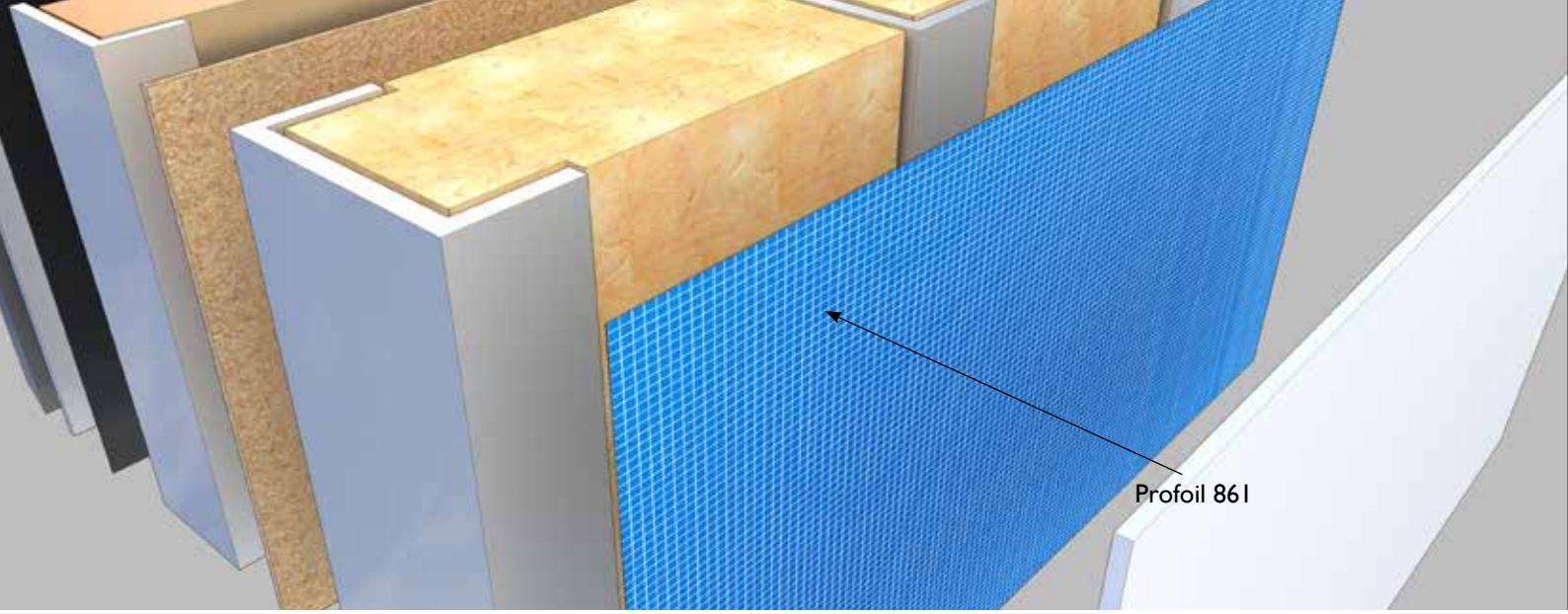
- Suitable for low risk applications e.g. heated warehouses
- Minimal tears due to reinforcement
- Reinforced to withstand tough site conditions
- Visibility to substructure for ease of installation

# PROCHECK® 500

Procheck 500 is a strong reinforced polyethylene vapour control layer with a vapour resistance of Sd 100m, making it suitable for low to medium risk applications e.g. offices, schools & housing. The woven extruded polypropylene multifilament scrim reinforcement provides nail tear resistance to withstand tough site conditions. The sheet is transparent allowing visibility to the substructure to ease the installation. Procheck 500 is the grade utilised by many leading system manufacturers. It is UV stabilised and unaffected by chlorine.

## Key Benefits

- Suitable for low to medium risk applications e.g. offices, housing
- Reinforced, ensuring minimal tears
- Reinforced to withstand tough site conditions
- Visibility to substructure




# PROFOIL 861

Profoil 861 is a heavyweight, reinforced, UV stabilised vapour control layer with an aluminium foil core which gives a high water vapour resistance of Sd 1700m. This makes it ideal for high risk applications such as swimming pools (unaffected by chlorine) and textile factories. The aluminium foil is protected on both faces by polyethylene for corrosive situations. The reinforced scrim ensures minimal tears so that it can withstand tough site handling while the encapsulated foil ensures high vapour resistance.

## Key Benefits

- Ideal for high risk applications e.g. leisure centres, textile factories
- Minimal tears
- Reinforced to withstand tough site conditions
- Unaffected by chlorine
- High vapour resistance

| Property | Procheck 125 | Procheck FR200 | Procheck 300 | Procheck 500 | Profoil 861 |
|---|---|---|---|---|---|
| BS EN 13984:2013 | | | | | |
| Thickness | 0.35mm | 0.06 mm | 0.3 mm | 0.5 mm | 0.4mm |
| Weight | 90g/m$^2$ | 94g/m$^2$ | 151g/m$^2$ | 238g/m$^2$ | 312g/m$^2$ |
| Roll Size | 2m x 50m | 1.6m x 50m | 2m x 50m | 2m x 50m | 2m x 50m |
| Colour | Translucent | Black / white | Translucent | Translucent | Blue / Silver |
| Vapour Resistance | 126MNs/g<br>Sd 25m | 220MNs/g<br>Sd 44m | >300MNs/g<br>Sd 64m | >500MNs/g<br>Sd 100m | >7000 MNs/g<br>Sd 1700m |
| Air Permeability* | 0 m$^3$/m$^2$.hr | - | 0 m$^3$/m$^2$.hr | 0 m$^3$/m$^2$.hr | 0 m$^3$/m$^2$.hr |
| Condensation Classification | Low | Low / Medium | Low | Low / Medium | High |

**Demonstrated no airflow at all pressures up to the maximum test level of 1000Pa. The resolution of the method is 0.1 m$^3$/m$^2$.hr*

# PROCHECK® A2

Procheck® A2, is a vapour and airtight membrane. BS EN 13501-1 confirms that Procheck A2 is considered to have limited combustibility and will not significantly contribute towards the fire load and fire growth. This composition affords the membrane its Class A2 performance as well as giving it a high degree of vapour controlling properties. The membrane comes with a high vapour resistance, as well as being airtight, which allows its use as an AVCL in the construction. Providing high levels of airtightness can ensure the thermal efficiency of the building.




The integral foil layer, with its protective clear lacquer coating, gives this A2 membrane the added benefit of having a low emissivity surface. This means that the membrane, when installed with the foil face next to a service cavity, with a minimum depth of 19mm, will provide additional thermal performance to the overall wall construction.

Procheck A2 air and vapour tight membrane improves energy efficiency and reduces the risk of condensation.

| Property | Test Method | Mean Results |
|---|---|---|
| | BS EN 13984:2013 | |
| Roll Size | - | 1.2m x 50m |
| Weight | EN 1849-2 | 165 g/m² |
| Sd value | EN 1931 | >1500m |
| Reaction to fire | EN 13501-1 | A2-s1,d0 |
| Water tightness | EN 1928 | W1 |
| Tensile Strength | EN 12311-1 | MD 700 N/50mm<br>CD 400 N/50mm |
| Elongation | EN 12311-1 | MD >2.5%<br>CD >2.5% |
| Tear resistance | EN 12310-1 | MD ≥160N<br>CD ≥130N |
| Thermal resistance of an adjacent airspace | - | 0.606 m²K/W |

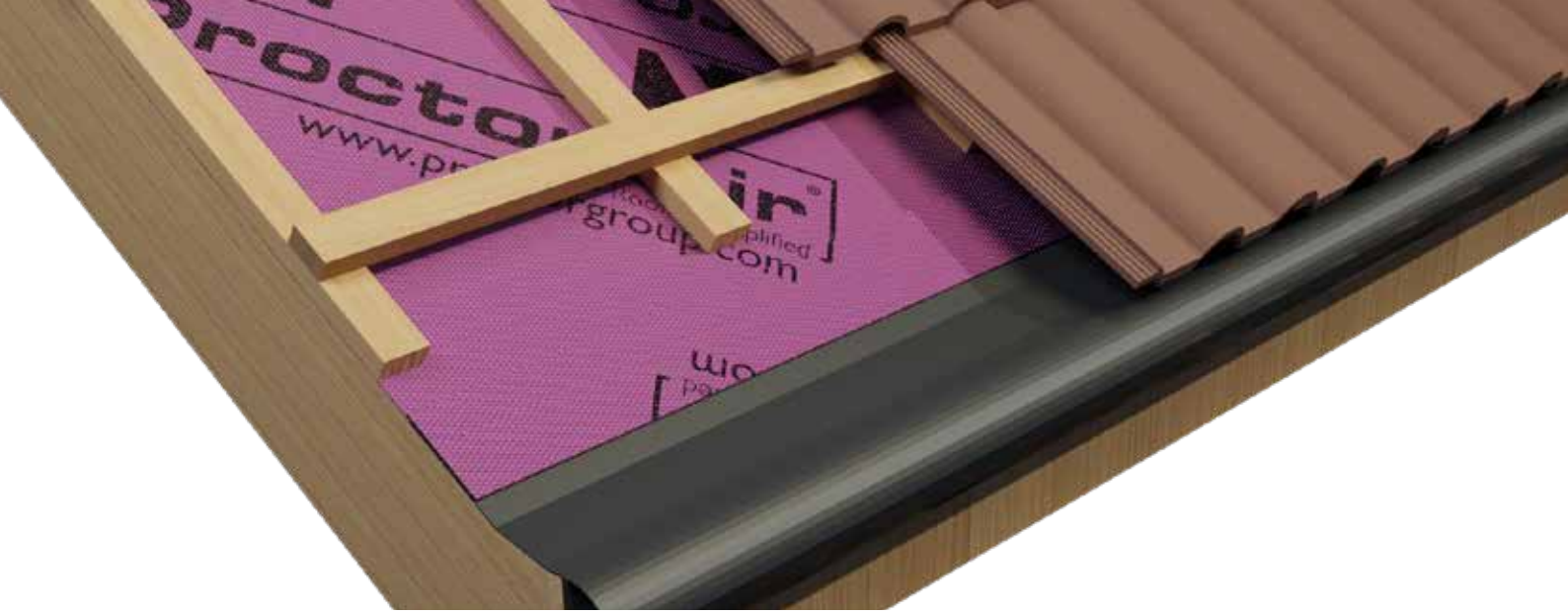
## Key Benefits

- Fire resistant to A2-s1,d0
- BBA Certificate No. 21/5982
- Water vapour diffusion tight
- Reflective material, emissivity <0.14
- Clear lacquered aluminium surface allows for low emissivity surface
- Able to withstand tough site conditions
- Suitable for use in relevant buildings and those over 11m/18m

## Accessories

Procheck FR Tape is an aluminium faced, air and vapour tight tape

- Reaction to fire - Euroclass A2 for system when used in conjunction with Procheck A2



# PROCTOR AIR®

**Proctor Air is the result of this quarter century of experience on sites and on drawing boards, listening and responding to the challenges faced by the industry. Proctor Air has been developed and manufactured to our precise specifications and requirements. This ensures the on-site performance of our material mirrors the off-site performance, while a 15 year warranty ensures peace of mind for any project, now and in the future. Hydrophobic additive in all three layers amplifies water holdout, and this, alongside optimised levels of permeability to both air and moisture vapour, Proctor Air delivers the most dependable performance.**

Proctor Air is an air and vapour permeable, water resistant roofing underlay. Its characteristics allow even very complex pitched roofs to breathe, without the need for air gaps or secondary venting.

The meltblown core at the heart of Proctor Air allows natural air movement to 'supercharge' the passage of moisture vapour from the roofspace, making the formation of condensation in the roofspace virtually impossible.

| Property | Test Method | Mean Results |
|---|---|---|
| | BS EN 13859-2:2010 | |
| Roll Size | - | 1m x 50m<br>1.5m x 50m |
| Mass per unit area | EN 1849-2 | 170 g/m² |
| Reaction to Fire | EN 13501-1 | Class E |
| Water Vapour Resistance Sd | EN 12572 | 0.015m |
| Vapour Resistance | EN 12572 | 0.075 MNs/g |
| Air Permeability (Average) | EN 12114 | 35 m³/m².h.50Pa |
| Water Penetration | EN 1928 | Class W1 (before ageing) |

## Key Benefits

- No ventilation required
- BBA Certificate No. 24/7147
- More uniform airflow than vents
- Water resistant
- Wind uplift resistance complies with BS5534
- High degree of vapour permeability greatly reduces the risk of condensation
- Reduces condensation risk and negates requirement for ridge ventilation
- Ensures continuity of air movement in loft
- Energy Loss by ventilation in conventionally ventilated cold roofs will be reduced by the non-vented system
- No reliance on different trades to install VCL
- Fully air permeable
- 15 year warranty

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BBA APPROVAL INSPECTION TESTING CERTIFICATION
CERTIFICATE 24/7147

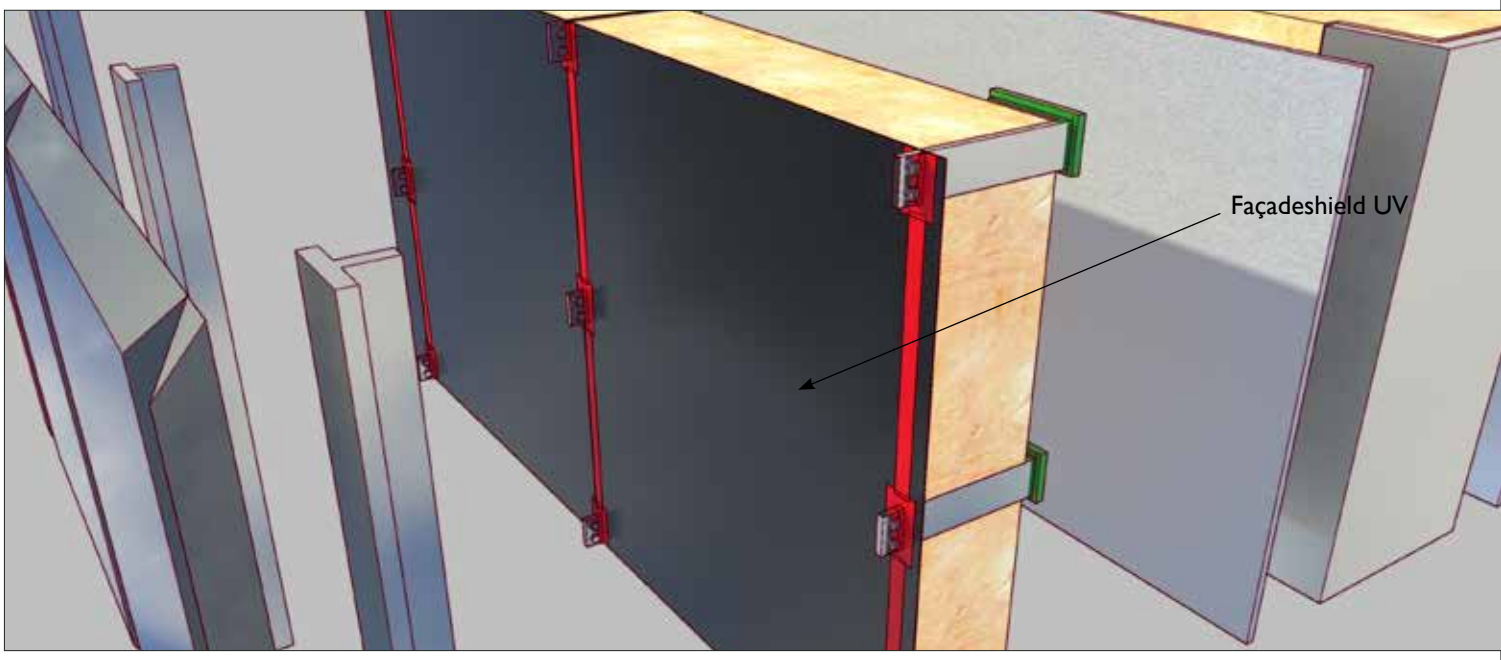
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Proctor Air® Warranty
Specify Responsibly

# FAÇADESHIELD® UV

Façadeshield UV is designed specifically to ensure the building fabric maintains water resistance and breathability when used behind open jointed façades. It is a breathable membrane that combines water and UV resistance with the anti-glare dark colour which provides a "shadow" appearance within open rainscreen façades. Façadeshield UV enhances the airtightness of the building whilst reducing the risk of condensation due to its' high vapour permeability, yet airtight fabric.




| Property | Test Method | Mean Results |
|---|---|---|
| | BS EN 13859-2:2010 | |
| Roll Size | EN 1848-2 | 1.5m x 50m |
| Weight | EN 1849-2 | 210 g/m² |
| Colour | | Black |
| Sd-value | EN ISO 12572 | 0.04 m |
| Temperature resistance | EN 13859-2 | - 40°C to +80°C |
| Fire performance* | EN 13501-1 / EN ISO 11925-2 | B-s1,d0 |
| Resistance to water permeability | EN 1928 | W 1 |
| UV resistance uncovered | | 12 months (Climate-Central Europe) |

## Key Benefits

- Provides secondary protection to open jointed & perforated façades
- Provides externally applied airtight layer for continuity of air barrier
- Class B fire performance
- Can be fully exposed for up to 12 months



# PROBREATHE® A2 AIR

Probreathe® A2 Air is a woven glass fibre membrane designed to provide good water resistance and breathability to the building fabric. This membrane is air permeable, and will be installed either directly to the sheathing board, or over the insulation, providing a Reaction to Fire classification of A2-s1,d0.

| Property | Test Method | Mean Results |
|---|---|---|
| | BS EN 13859-2:2010 | |
| Roll Size | | 1.5m x 50m |
| Weight | | 210 g/m$^2$ |
| Thickness | | 0.18mm |
| Air permeability | EN 12114:2000 | 27m$^3$/(h.m$^2$) |
| Vapour permeability | EN 12572 | Sd 0.03m |
| Temperature range | | -36°C to 150°C |
| Resistance to water penetration | EN 1928 | W2 |
| Reaction to Fire* | EN 13501-1 | A2-s1,d0 |

**free-hanging*

## Key Benefits

- A2 Reaction to Fire Classification
- Vapour permeable membrane for use either directly onto sheathing or over insulation.
- Ideal for use in rainscreen/facade construction
- Suitable in relevant buildings and those over 11m/18m

## ACCESSORIES

- Probreathe Duo Tape (50mm x 25m)
- Probreathe FR Tape (75mm x 50m)

# FIRESHIELD®

**Fireshield is a vapour permeable walling underlay with an intumescent coated surface. Fireshield is suitable for all walling applications including those in multiple storey buildings. The intumescent coating helps protect the substrate by reducing the risk of fire taking hold and reduces the formation of droplets and smoke. It is installed and fixed to the substrate in the same manner as standard breather membranes using mechanical fixings.**

Fireshield can also be used on the external cavity face to improve the fire robustness of closed panel assemblies when installed to the external sheathing alongside suitable non-combustible internal linings.

Fireshield is the first vapour permeable membrane of its kind approved for inclusion in the structural timber association tested product listing for fire robustness during construction. As part of such a construction, Fireshield will be part of a system to limit the spread of fire to adjacent properties, which can allow for reduced spacing to adjacent properties.




| Property | Test Method | Mean Results |
|---|---|---|
| | BS EN 13859-2:2010 | |
| Roll Size | - | 1.1m x 20m |
| Weight | EN 1849-2 | 737g/m² |
| Thickness | EN 1849-2 | 1.2mm |
| Nail Tear Resistance | EN 12310-1 | MD 273N<br>CD 330N |
| Resistance to water penetration | EN 13859-1 | Class W1 |
| Tensile Strength | EN 12311-1 | MD 300N/5cm<br>CD 275N/5cm |
| Elongation | EN 12311-1 | MD 2-3%<br>CD 2-3% |
| Water impermeability | EN 20811 | Minimum value: 2m |
| UV resistance | Internal method, UVB | 12 months |
| Water vapour transmission properties | EN ISO 12572 conditions C | Sd=0.08m |
| Flexibility at low temperature | EN 1109 | -20°C |
| Reaction to Fire | EN 13501-1<br>Test method:<br>EN 11925-2 and<br>EN 13823 (SBI) | B-s1,d0 |
| Resistance to air penetration | EN 12114 | 1m³/m²/hr@50Pa |
| Artificial ageing (5000h uv + 90 days 70°C)<br>Tensile strength after ageing<br>Resistance to water penetration after ageing | EN 13859-1 | MD: 290N/5cm<br>CD 240N/5cm<br>Class W1 |

## Key Benefits

- Unique composition actively reacts to prevent fire taking hold
- BBA Certificate No. 19/5653
- Vapour permeable walling underlay for use either directly onto sheathing or insulation
- Class B-s1,d0 but performs differently to other similar class products
- Complies with BS5250, BS4016 & NHBC requirements for vapour permeable walling underlays
- Ideal for use in rainscreen / façade construction
- Suitable for use in relevant buildings and those over 11m/18m

BBA APPROVAL INSPECTION TESTING CERTIFICATION
CERTIFICATE 19/5653

NBS

CCPi




# FRAMEPRO® W1

**FramePro W1 is a vapour permeable, airtight wall underlay which is flexible and allows for simple installation. FramePro W1 is water resistant and has a resilient composition, which resists punctures and tears during installation.**

FramePro W1 can be utilised with Wraptite Tape to provide a simplified method of achieving low air leakage rates, particularly when installed on site, as is typical with large scale rain screen construction, or when sealing junctions between prefabricated building components. By reducing the likelihood of failures to meet designed airtight levels, FramePro W1 helps ensure "as designed" performance is achieved. This helps to narrow the performance gap between as designed and actual energy performance. FramePro W1 is designed to cost effectively replace conventional breather membranes whilst increasing airtightness.

| Property | Test Method | Mean Results | |
|---|---|---|---|
| | BS EN 13859-2:2010 | | |
| Roll sizes | - | 1.5m x 50m | |
| Thickness | - | 0.4mm | |
| Mass per unit area | EN 1849-2 | 100 g/m² | |
| Reaction to Fire | EN 11925-2 | Class E | |
| Water vapour resistance | EN 12572 | Sd 0.02m | |
| Water Penetration | EN 1928 | Class W1 (before ageing)<br>Class W1 (after ageing) | |
| Tensile Strength | EN 12311-1 | MD 240N<br>MD 200N | CD 125N (before ageing)<br>CD 110N (after ageing) |
| Tear Resistance | EN 12310-1 | MD 100N | CD 120N |
| Elongation | EN 12311-1 | MD 60%<br>MD 50% | CD 70% (before ageing)<br>CD 90% (after ageing) |

## Key Benefits

- Increased airtightness over breather membranes
- BBA Certificate No. 24/7182
- Allows temporary protection until primary external covering is installed / applied
- Provides reduced risk of tears and subsequent remedial work
- Airtight and vapour permeable

BBA APPROVAL INSPECTION TESTING CERTIFICATION
CERTIFICATE 24/7182

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# Specialist Services and Technical Support

Our technical back-up has always been an integral part of our strategic development, with an outlook based on advanced technical solutions, rather than commodity driven.
Our dedicated technical team is focused on providing high quality advice and support to our customers all the way from drawing board to site.



### Customer Focused

- Online Technical Advice
- Members Area / Onsite App
- WUFI & U-Value Calculations
- Condensation Risk Analysis
- CAD Design
- Site Advice
- CPD Presentations
- Accreditations

## Expertise and know-how to support your project

### CONDENSATION RISK ANALYSIS

Condensation can significantly reduce the effectiveness of insulation, and result in damage to the building fabric.
A Condensation Risk Analysis evaluates the likelihood of interstitial condensation in your roof or wall construction. These calculations are regularly required by building control to demonstrate compliance with building regulation requirements. Calculations are performed free of charge when using our products.

### BIM DATA

Available through NBS Chorus and NBS Source, specifiers can now access a full suite of digital products and technical specifications for many of our product solutions. The collaboration with NBS provides architects and designers with a comprehensive technical specification writing service. In addition, specifiers have access to the manufacturer's specification data, BIM objects, literature and third-party certifications.

### PRODUCT DIVISIONS

We provide a wide range of high quality, innovative solutions which are designed to meet the continuously evolving requirements of the construction industry.

**Product divisions include:**

- Condensation Control Membranes
- Acoustic Floor Solutions
- External Airtight Barriers
- Ground Gas Protection
- Thermal Solutions

**Get in touch for more information**
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# Case Study - Grade II listed townhouse, Bath

**A Grade II listed Georgian townhouse in the historic city of Bath is set to be become more energy efficient following the installation of Spacetherm® Multi insulation.**

The challenge of dealing with heating inefficiencies, major heat loss and high heating costs are a common problem with many listed buildings and solid wall dwellings.

Property owner Mike Mower explains, "I obtained planning permission to insulate the top floor of my Grade II listed Georgian townhouse as it is single skin 6" Bath stone (Oolite) and very heat inefficient, all walls have the original lime render and skim and so they need to breathe. The property in Bath was built in 1818 and has been in my family for 101 years since 1919! I am the 3rd generation to live in it and it was last renovated in 1935 so it needs serious upgrading!

"The architect originally specified another insulation but this would have required encroaching 100mm into the room and would necessitate moving door frames and rebuilding window reveals. After extensive research, I identified the Spacetherm Multi aerogel product from the A. Proctor Group.

"The architect was so impressed by the thermal efficiency of the Spacetherm Multi. With a total thickness of 20mm when rendered, this will not encroach onto the floor space, and the door frames and windows will not need to be altered. Subsequently we included Spacetherm Multi on the planning application as an alternative to the traditional insulation originally specified, which was approved by the Conservation officer and building control."

The renovation of the house is being managed and installed directly by the owner and a lime plaster finish will be applied professionally by a contractor upon completion of the installation.

At just 16mm thick, the use of Spacetherm Multi has virtually no negative impact on floor space, making it ideal for refurbishment projects where space is at a premium.

Typically, a solid wall will have a U value of around 2.1 W/m$^2$K. Following the application of Spacetherm Multi, this can be reduced to around 0.8 W/m$^2$K, dependent on the wall structure.

Finally, Mike Mower commented "I think Spacetherm Multi is ideal for listed building insulation as it has a minimal effect on the infrastructure



of the original building. It has the potential to be used extensively in old buildings such as we have in Bath where heat loss is at a maximum, the original walls need to be able to breathe when insulated and insulation has hitherto been impossible due to the visual impact encroaching on the listed building. I am also seeking planning permission to use the product to insulate the basement floor and walls."

# Case Study - Private House, Perthshire

**An impressive new contemporary award-winning Eco House in Perthshire has benefitted from the airtightness performance qualities of Wraptite®.**

The house "Tighétébhu" was constructed by SIPS Scotland and was been chosen as the winner of the Best SIPs Home in the Build It Awards 2018. The new property was a self-build project commissioned by Keira Proctor, Managing Director of the A. Proctor Group, and designed by Allan Corfield Architects, Dunfermline who are specialists in Self Build. Commenting on the news about the award Keira said, "I am delighted that Tighétébhu has been recognised for the award as 'Best SIPs Home', which is testimony to the high quality of the work achieved by SIPs Scotland, and it's a further endorsement of the airtight performance of Wraptite in buildings."

Wraptite, the only self-adhering external vapour permeable air barrier certified by the BBA, was installed as part of the Structural Insulated Panel (SIPs) construction of the home. The use of Wraptite in the construction made a contribution to a building's thermal performance by preventing lateral air movement. It also provided high vapour permeability in a continuously sealed, self-adhered, airtight membrane.

Another key benefit of the system is that the high vapour permeability of Wraptite allows the substrate beneath to dry quickly and moisture vapour to escape. This ensures indoor air quality and reduces the likelihood of mould, mildew, condensation, timber distortion and metal corrosion.

Alongside Wraptite, additional products were selected from the A.Proctor portfolio to enhance the thermal performance of the property including Reflectatherm Premier a reflective, vapour control layer, and Spacetherm® CBS (Cold Bridge Strip), which uses Spacetherm Aerogel insulation encapsulated in polyethelene for use in thermal bridging through a component or element of the structure. Reflectatherm Premier provides a vapour control layer, with integrated



tape for ease of installation, which restricts the passage of water vapour, combined with a heat reflecting low emissivity coating, which is designed to improve energy efficiency and enhance thermal performance when placed on the warm side of the insulation.

Spacetherm CBS was used to mitigate thermal bridging in the area of the sunken living area within the property. Engineered for unsurpassed thermal performance in space-critical applications, Spacetherm CBS is ideal when seeking to reduce thermal bridging in timber or steel structures.

The combination and introduction of an integrated approach using high-performance products within the construction have ensured that the final outcome is an award-winning, A-Rated energy efficient house, which has been designed with best practice principles of managing the balance of Heat, Air, Moisture movement (HAMM).





*" I believe the success of the A. Proctor Group is down to a solid foundation of innovation backed up by an excellent, loyal and committed team, every one of them playing an important role in our continued success. Scotland provides us with a unique platform to launch our ideas, systems and products. I am fiercely proud of this heritage and our brand."*

Keira Proctor
Managing Director, A. Proctor Group Ltd

Proctor Group

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