Modular & Offsite Solutions

SPECIALIST MEMBRANE SOLUTIONS FOR CONSTRUCTION INCLUDING STEEL, CONCRETE, CLT, SIPS & TIMBER

System Solution Providers
A. Proctor Group
Experts in membrane systems

The A. Proctor Group has, for 50 years, been serving the construction industry with an extensive portfolio of technically advanced thermal, acoustic and membrane products. A trusted brand with architects, developers and contractors, the range includes the industry’s highest performing solutions such as Roofshield, the high quality, unique air and vapour permeable pitched roof underlay, and Wraptite, an external air barrier solving the challenge of reliably achieving airtightness in buildings.

Total Solution Capabilities
From concept to completion

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.
Design for Manufacture and Assembly (DfMA)

Design for Manufacture and Assembly (DfMA) is a design approach which combines the best of two key methodologies, Design for Manufacture and Design for Assembly. The application of DfMA is ideally suited towards offsite modular construction, with its focus on ease and efficiency of both manufacture and assembly.

The A. Proctor Group Ltd has been providing solutions to the construction industry for over 50 years, including an extensive range of superior high-performance vapour permeable membranes, vapour control layers and products suitable for modular and off-site construction.

The A. Proctor Group range includes unique off-site solutions for the following sectors:

- Private and social/affordable housing
- Purpose built student accommodation
- Self-build projects
- Hotels
- Education and office buildings
- Healthcare including hospitals, health centres and healthcare facilities

Design Considerations

Designers and manufacturers of offsite modular buildings using best practice building design will consider the following key aspects:

- The importance of Heat, Air & Moisture Management (HAMM) in offsite building manufacture
- Building Regulations
- Modelling & Analysis
- External vs Internal Air & Vapour Control
- Fixing Options for Air & Vapour Control
- Guaranteeing Protection Factory to Site
Heat, Air & Moisture Management (HAMM) in offsite building manufacture

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 offsite modular 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.
Standards & Building Regulations

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, Ireland 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

- Part C Site Preparation and Resistance to Contaminants and Moisture 2013
- Part C Site Preparation and Resistance to Moisture (Ireland 1997)
- Building Standards Section 3 Environment (Scotland 2017)
- Part L - Conservation of Fuel and Energy (Ireland 2019)
- Building Standards Section 6 Energy (Scotland 2017)
- Part B Fire Safety
- Part F1 Means of Ventilation (England & Wales)
- Part F - Ventilation (Ireland 2019)

Product & Performance Standards

- BS EN 15026:2007 Hygrothermal Performance of Building Components and Building Elements
Standards & Building Regulations

Amendment to Approved Document B: November 2018

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 has a significant impact on the design and construction of buildings above 18 metres. 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:
• 12.14 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.

**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.

BS5250 (The Code of Practice for Control of Condensation in Buildings) 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
External vs Internal Air & Vapour Control

The two main ways to achieve airtightness and manage vapour control in the building envelope are internally or externally, or in other terms, “inside of the services zone’ or ‘outside of the services zone’. The use of an effective external air barrier can offer the following benefits:

- External air barrier vs internal VCL - An external barrier such as Wraptite can lead to the removal of the VCL - Achieving airtightness and moisture control, whilst reducing the level of insulation thickness required, gaining more space.

- External line vs internal line – External detailing can remove the risk of weaknesses created by internal works penetrating through the VCL and compromising airtightness and vapour control.

Traditional use of internal air barriers can be more complex and costly to install, due to the need to accommodate building services such as electrical, lighting, heating and drainage systems. An internal air barrier is only as good as its’ installation. If all the service penetrations are not adequately sealed, performance will be compromised.

By moving the air barrier to the external side of the structural frame, an external air barrier system such as Wraptite provides an almost penetration-free airtight layer, which can be installed faster and more robustly.

Far simpler than internal options Wraptite external air barrier system will maintain the envelope’s integrity, with less building services and structural penetrations to be sealed, and less room for error.

Fixing Options for Air & Vapour Control

The traditional forms of VCLs and airtightness membranes will often require mechanical fixing. The self-adhered nature of Wraptite allows for a simple and fast installation process, minimising the use of additional sealants and tapes, and requiring no specialist contractors to achieve a robust result.

This one-step solution provides both a damage resistant air barrier layer and effective secondary weather protection in one installation process, allowing a wind and watertight envelope to be achieved more quickly than using traditional methods.
Protection from Factory to Site

One of the challenges facing manufacturers and developers using modular and offsite construction methods is how to ensure that the performance of any factory fitted membrane is not compromised during transportation from factory to site. The exposure to the elements of the UK climate experienced during transportation to site can in some cases adversely affect the quality of the membrane, resulting in damage due to wind, rain, and more.

The Wraprite air barrier system offers a safer and simplified membrane system and provides a fully self-adhered vapour permeable air barrier certified by the BBA and combines the important properties of vapour permeability and airtightness. The self-adhesive membrane is easily applied in the factory, bonded externally to the substrate, and ensures that the membrane is held firmly in place, even during transportation, maintaining the quality of the system from installation to build and completion.

- A fully self-adhered system ideally suited to offsite modular factory manufacture and transportation – Provides total protection externally from factory to site – removes the requirement to provide additional wrapping of units before leaving the factory – saves time, cost, maintaining system integrity and preventing damage to the building.
The Wraptite membrane has been developed to provide a simple and robust solution to the challenges of reducing air leakage.

<table>
<thead>
<tr>
<th>Product Selector</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Airtightness</strong></td>
</tr>
<tr>
<td>• Wraptite</td>
</tr>
<tr>
<td>• Wraptite Liquid Flashing</td>
</tr>
<tr>
<td>• Wraptite Corners</td>
</tr>
<tr>
<td>• Wraptite Tape</td>
</tr>
<tr>
<td><strong>Thermal Insulation</strong></td>
</tr>
<tr>
<td>• Wrapttherm</td>
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<tr>
<td>• Spacetherm SLENTEX® A2</td>
</tr>
<tr>
<td><strong>Condensation Control</strong></td>
</tr>
<tr>
<td>• Fireshield</td>
</tr>
<tr>
<td>• Procheck Adapt</td>
</tr>
<tr>
<td>• Roofshield</td>
</tr>
<tr>
<td>• Procheck FR200</td>
</tr>
<tr>
<td>• Procheck A2</td>
</tr>
</tbody>
</table>
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.
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 Liquid Flashing
- Wraptite Corners
- Wraptite Tape

Benefits of air-tight buildings

- More thermally efficient
- Reduce energy costs
- Lower CO₂ emissions
- Reduce interstitial condensation
- Improved performance of HVAC
- Improved health and comfort for occupants
WRAPTITE®

Wraptite is a unique 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 is lightweight, easy to install and 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 unique 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
- Self adhered to avoid air bypass
- Full adhesion avoids damage during transportation of modular timber frame kits to site
- Part B compliant for buildings over 18m / 11m in Scotland under Section 2
- BRE acceptance for buildings over 18m high
- Class B, s1, d0 on A2, s1, d0 or A1 substrate with minimum density of 653kg/m³ and 9mm thickness
- 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
- Unique patented technology
- Continuous airtight seal
- Simple detailing at junctions and corners - less EPDM required

Applications
- SIPs panels
- Steel and timber framed constructions
- Façade systems
- Cassette floor construction
- Unventilated warm roofs
- Exterior Gypsum Sheathing
- Aluminium (painted or mill finish)
- OSB
- Rigid insulation
- Cast-in-place concrete
- Rigid vinyl
- Pre-painted steel
- Galvanized metal
- Precast concrete
- Steel
- Concrete block
- Plywood

<table>
<thead>
<tr>
<th>Property</th>
<th>Roll Size</th>
<th>Nominal Thickness</th>
<th>Basis Weight</th>
<th>Application Temperature</th>
<th>Service Temperature</th>
<th>Water Penetration</th>
<th>Air Permeance</th>
<th>Water Vapour Resistance</th>
<th>Water Vapour Transmission</th>
<th>Peel Adhesion</th>
<th>Tensile Strength</th>
<th>Tear Resistance</th>
<th>Reaction to Fire</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>1.5m x 50m</td>
<td>0.65mm</td>
<td>292 g/m²</td>
<td>Air &amp; surface: minimum -10°C maximum 60°C</td>
<td>-40°C to +100°C</td>
<td>EN 1928 : 2000 Method A</td>
<td>EN 12114</td>
<td>Sd EN 12572</td>
<td>BS 3177:1959</td>
<td>EN 1939</td>
<td>EN 12311-1</td>
<td>EN 12310-1</td>
<td>EN 1925-2 BS EN 13501-1</td>
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<td></td>
<td></td>
<td></td>
<td>Mean MD 417N</td>
<td>Class W1 (before ageing)</td>
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<td></td>
<td>0.01 m³/h/100 Pa</td>
<td>0.039m</td>
<td>893 g/m²/24hr</td>
<td>Mean MD 417N</td>
<td>Mean MD 412N</td>
<td>Mean MD 286N</td>
<td>Class B, s1, d0°</td>
</tr>
</tbody>
</table>

*tested over 12mm calcium silicate board / fibre cement board as per BS EN 13238:2010. All tests carried out to EN 13859-2 standard.*
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 the entire line of our 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
- Easily applied and spread
- Does not harm foam insulation

Applications
- Sealing around service and structural penetrations
- Window details
- Sealing around bracketry components
- Protecting the leading edge of the exposed membrane
WRAPTITE® CORNERS

Wraptite Preformed Airtight Corners have been developed for the difficult areas around doors and windows where maintaining good 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. This helps achieve the best possible results in the shortest possible time.

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.

Key Benefits
• Easy installation
• Ensures continuity of airtightness measures
• Simplifies complex detailing
• Faster installation

Applications
• Ensuring that windows are easily made airtight
• Reducing reliance on taped detailing
WRAPTITE® TAPE

A useful way of stopping unnecessary air leakage around openings and overlaps is to use Wraptite Tape, an airtight, tear resistant tape with high vapour permeability for internal and external applications. Wraptite Tape’s flexibility facilitates ease of application 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 good indoor air quality and reduces the likelihood of mould, mildew, condensation, timber distortion and metal corrosion. Wraptite Tape contains no VOC’s.

Key Benefits
- Vapour permeable tape used to protect exposed joints in insulation
- Airtight
- Easy to use when detailing joints
- Ultimate airtightness accessory
- Can seal joints in mechanically fastened air barrier

Please visit our website or Wraptite brochure for full product details
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.
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 embraces the principles of HAMM, considering an integrated approach to airtightness and condensation control.

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.

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.

The A. Proctor Group has 50 years experience in the Thermal Insulation sector. We offer a complete range of thermal insulation products and technical support including U-value calculations. Our advanced fabrication facilities offer the ability to cut our Spacetherm aerogel insulation to almost any required size, thickness or shape.

Product Range

- Spacetherm SLENTEX® A2
- Wraptherm

Guidance on thermal insulation

- ‘U’ Value calculations
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 high thermal performance 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 robust sealing of the joints in the panel to ensure the continuity, integrity and robustness of the airtight layer.

<table>
<thead>
<tr>
<th>Property</th>
<th>Test Method</th>
<th>Mean Results</th>
</tr>
</thead>
<tbody>
<tr>
<td>Coverage</td>
<td>-</td>
<td>2400mm x 1200mm or 1200mm x 1200mm</td>
</tr>
<tr>
<td>Nominal Thickness</td>
<td>-</td>
<td>11.5mm</td>
</tr>
<tr>
<td>Weight</td>
<td>-</td>
<td>2.40kg/m² or 1.2 kg/m²</td>
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<tr>
<td>Water Vapour Resistance Sd</td>
<td>BS EN 12086</td>
<td>0.101m</td>
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<tr>
<td>Water Vapour Diffusion μ</td>
<td>BS EN 12086</td>
<td>8.806</td>
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<tr>
<td>Thermal Resistance</td>
<td></td>
<td>0.667 m²K/W (Insulation - membrane negligible)</td>
</tr>
</tbody>
</table>

Key Benefits

- Single product airtightness and thermal bridging solution
- Ideal for Refurbishment and Façade Retention projects
- Water resistant yet vapour permeable membrane
- Leading Airtightness performance
- Reduces thermal bridging
- Continuous airtightness seal
- Tested low vapour resistance
SPACETHERM® SLENTEX® A2

Spacetherm SLENTEX® A2 is a flexible, high-performance, silica aerogel-based insulation material of limited combustibility used for exterior and interior applications. Supplied in a variety of finishes, the substantial layers of Spacetherm SLENTEX® A2 meet the requirements for A2 classification. 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 SLENTEX® A2 is also useful in minimising thermal bridges around windows in areas such as window reveals and roller shutter cases.

With a thermal conductivity of 0.019 W/mK, Spacetherm SLENTEX® A2’s performance, coupled with its superior fire performance, qualify it as one of the best insulation materials available worldwide. Engineered for space-critical applications, the product offers low thermal conductivity plus breathability allied to hydrophobic characteristics. 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.

Applications
- Ideal where insulation with increased fire resistance is required
- Reduces cold bridging
- Wrapping structural penetrations
- Window reveals
- Roller shutter cases
- Column/Slab faces
- Façade Systems
- For use in space critical applications

Key Benefits
- Class leading fire Aerogel performance
- Superior thermal performance
- Limited combustibility
- Water vapour diffusion open
- Permeable
- Flexible
- Thinnest A2 Aerogel insulation available

ETA - 18/0011 Dated 6th December 2018
* Other thicknesses available on request

<table>
<thead>
<tr>
<th>Property</th>
<th>Test Method</th>
<th>Mean Results</th>
</tr>
</thead>
<tbody>
<tr>
<td>Reaction-to-Fire</td>
<td>EN 13501-1</td>
<td>A2-s1, d0</td>
</tr>
<tr>
<td>Thickness</td>
<td>-</td>
<td>10, 20, 30, 40mm³</td>
</tr>
<tr>
<td>Width</td>
<td>-</td>
<td>Up to 1500 mm</td>
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<tr>
<td>Colour</td>
<td>-</td>
<td>White</td>
</tr>
<tr>
<td>Thermal Conductivity</td>
<td>EN 12667</td>
<td>0.019 W/m-K</td>
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<tr>
<td>Density</td>
<td>EN 1602</td>
<td>190-200 kg/m³</td>
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<tr>
<td>Dimensional Stability</td>
<td>EN 1604</td>
<td>Δ &lt;0.6% @ 70°C, 48hrs</td>
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<tr>
<td>Compressive Strength</td>
<td>EN 826</td>
<td>30 kPa at 10% compression</td>
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<tr>
<td>Tensile Strength</td>
<td>EN 1607</td>
<td>16 kPa perpendicular to faces compression</td>
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<td>Tensile Strength</td>
<td>EN 1608</td>
<td>1085 kPa parallel to faces</td>
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<tr>
<td>Short Term Water Absorption</td>
<td>EN 1609 (A)</td>
<td>0.04 kg/m² (partial immersion 24hrs)</td>
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<tr>
<td>Long Term Water Absorption</td>
<td>EN 12087 (1A)</td>
<td>0.10 kg/m² (full immersion 48hrs)</td>
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<tr>
<td>Water Vapour Permeability, μ-Value</td>
<td>EN 12086</td>
<td>5</td>
</tr>
<tr>
<td>Organic Content of Spacetherm A2</td>
<td>DIN EN 13820</td>
<td>3.8 Gew.-%</td>
</tr>
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</table>
Condensation Control

Innovative high performing solutions

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 innovative solutions includes FireShielD (vapour permeable walling membrane with a fireproof surface), Procheck Adapt (high performing variable resistance vapour control layer), and Roofshield (industry-leading air and vapour permeable pitched roof underlay).
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

- Fireshield
- Procheck Adapt
- Roofshield
- Procheck FR200
- Procheck A2

Guidance on condensation control

- Condensation risk assessments
- ‘U’ Value calculations
- Overcoming condensation in the roofspace
Fireshield is a vapour permeable walling membrane with a fire proof surface. Fireshield is suitable for all walling applications including those in multiple storey buildings. Its unique coating doesn’t just resist fire, but eliminates fire spread. 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 fire resistant vapour permeable membrane 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.

<table>
<thead>
<tr>
<th>Property</th>
<th>Test Method</th>
<th>Mean Results</th>
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<tbody>
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<td>Roll Sizes</td>
<td>-</td>
<td>1.1m x 20m</td>
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<td>Weight</td>
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<td>Thickness</td>
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<td>MD 273N</td>
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<td></td>
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<td>CD 330N</td>
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<td>Resistance to Water Penetration</td>
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<td>Tensile Strength</td>
<td>EN 12311-1</td>
<td>MD 300N/5cm</td>
</tr>
<tr>
<td></td>
<td></td>
<td>CD 275N/5cm</td>
</tr>
<tr>
<td>Elongation</td>
<td>EN 12311-1</td>
<td>MD 2-3%</td>
</tr>
<tr>
<td></td>
<td></td>
<td>CD 2-3%</td>
</tr>
<tr>
<td>Water Impermeability</td>
<td>EN 20811</td>
<td>Minimum Value: 2m</td>
</tr>
<tr>
<td>UV Resistance</td>
<td>Internal Method, UVB</td>
<td>12 Months</td>
</tr>
<tr>
<td>Water Vapour Transmission</td>
<td>EN ISO 12572</td>
<td>SD=0.08m</td>
</tr>
<tr>
<td>Flexibility at Low Temperature</td>
<td>EN 1109</td>
<td>-20°C</td>
</tr>
<tr>
<td>Reaction to Fire</td>
<td>EN 13501-1 Test Method: EN 11925-2 &amp; EN 13823 (SBM)</td>
<td>B, s1, d0</td>
</tr>
<tr>
<td>Resistance to Air Penetration</td>
<td>EN 12114</td>
<td>1m³/m²/hr@50Pa</td>
</tr>
<tr>
<td>Artificial ageing (5000h ur + 90 days 70°C)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Tensile strength after ageing</td>
<td>EN 13859-1</td>
<td>MD: 290N/5cm</td>
</tr>
<tr>
<td></td>
<td></td>
<td>CD 240N/5cm</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Class W1</td>
</tr>
</tbody>
</table>

Key Benefits

- Part B compliant for buildings over 18m/11m in Scotland
- Unique composition actively reacts to prevent fire taking hold
- Vapour permeable walling membrane 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 open jointed rainscreen/façade construction
PROCHECK® ADAPT

Procheck Adapt is a high performance 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 and in conjunction with its integral tape allows for a fast installation time.

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

Applications
- Situations with varying vapour requirements
- Allows concrete/masonry to dry internally
- Suitable for commerical and residential applications

<table>
<thead>
<tr>
<th>Property</th>
<th>Test Method</th>
<th>Mean Results</th>
</tr>
</thead>
<tbody>
<tr>
<td>Roll Size</td>
<td>-</td>
<td>1.5m x 50m</td>
</tr>
<tr>
<td></td>
<td></td>
<td>3m x 50m</td>
</tr>
<tr>
<td>Weight</td>
<td>ISO 536</td>
<td>110 g/m&lt;sup&gt;2&lt;/sup&gt;</td>
</tr>
<tr>
<td>Nail Tear Resistance</td>
<td>EN 12310-1</td>
<td>MD 350N</td>
</tr>
<tr>
<td></td>
<td></td>
<td>CD 375N</td>
</tr>
<tr>
<td>Tensile Strength</td>
<td>EN 12311-1</td>
<td>MD 350N/50mm</td>
</tr>
<tr>
<td></td>
<td></td>
<td>CD 315N/50mm</td>
</tr>
<tr>
<td>Elongation</td>
<td>EN 12311-1</td>
<td>MD 20%</td>
</tr>
<tr>
<td></td>
<td></td>
<td>CD 20%</td>
</tr>
<tr>
<td>Vapour Resistance</td>
<td>EN 12572</td>
<td>Sd 0.4m - 90m</td>
</tr>
<tr>
<td>Reaction to Fire</td>
<td>EN 13501-1</td>
<td>Class E</td>
</tr>
<tr>
<td>Air Permeability</td>
<td>BS EN 12114:2000</td>
<td>0.00 m&lt;sup&gt;3&lt;/sup&gt;/m&lt;sup&gt;2&lt;/sup&gt;/hr @ 50 Pa</td>
</tr>
</tbody>
</table>
Roofshield is an air and vapour permeable pitched roof underlay for installation beneath tiles and slates. It is highly water resistant, providing a secondary barrier to the ingress of rain, wind and snow and reduces interstitial condensation. It has been made to the same high standard for over 20 years, and has consistently met the evolving demands of the roofing industry to be the first choice for most roofing contractors. It complies with BS5534. The underlay’s reliable performance has been demonstrated in the toughest locations around the world. Its characteristics allow even very complex pitched roofs to breathe, without the need for air gaps or secondary venting. The unique, patented meltblown core at the heart of Roofshield allows natural air movement to ‘supercharge’ the passage of moisture vapour from the roofspace, making the formation of condensation in the roofspace virtually impossible.

With a certified air permeability of 34.4 m³/m²h.50Pa, Roofshield does not require additional high level ventilation when used on NHBC-approved projects. This allows the same specification to be used across all your projects, regardless of the regulations applied. The elimination of openings in the temporary roof covering also reduces the potential for water ingress during construction, and the possibility of installation errors. Roofshield is the only vapour permeable underlay which the BBA puts enough trust in to explicitly state in their certificate that a vapour control layer is not required for non-ventilated, cold pitched roof constructions.

### Properties

<table>
<thead>
<tr>
<th>Property</th>
<th>Test Method</th>
<th>Mean Results</th>
</tr>
</thead>
<tbody>
<tr>
<td>Roll Size</td>
<td></td>
<td>1m x 50m 1.5m x 50m</td>
</tr>
<tr>
<td>Mass per unit area</td>
<td>EN 1849-2</td>
<td>185 g/m²</td>
</tr>
<tr>
<td>Reaction to Fire</td>
<td>EN 13501-1</td>
<td>Class E</td>
</tr>
<tr>
<td>Water Vapour Resistance</td>
<td>EN 12572</td>
<td>0.013m</td>
</tr>
<tr>
<td>Vapour Resistance</td>
<td>EN 12572</td>
<td>0.065 MN/s/g</td>
</tr>
<tr>
<td>Air Permeability</td>
<td>EN 12114</td>
<td>34.4 m³/m²h.50Pa</td>
</tr>
<tr>
<td>Water Penetration</td>
<td>EN 1928</td>
<td>Class W1 (before ageing)</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Class W1 (after ageing)</td>
</tr>
</tbody>
</table>

### Key Benefits

- No ventilation required
- More uniform airflow than vents
- High degree of vapour permeability greatly reduces the risk of condensation
- Significantly reduces condensation risk and negates requirement for ridge ventilation
- Ensures continuity of air movement in loft
- Gives protection to the building until primary water shedding layer, e.g. slates or tiles, is installed
- No reliance on different trades to install VCL
- Air permeable
Procheck FR200 is used as a fire retardant vapour control layer in roof and wall structures in new build and renovation projects. It has a Reaction to Fire classification of B-s1, d0 which provides assurance of fire performance for the structure and is air and vapour tight improving the energy efficiency of the building while also reducing the condensation risk.

### Key Benefits
- Independent assurance of fire performance (Class 0 to BS 476 parts 6 & 7 and EN 13501-1 B, s1,d0)
- Improved energy efficiency
- Reduced condensation risk
- Withstands tough site conditions

### Property Test Results

<table>
<thead>
<tr>
<th>Property</th>
<th>Test Method</th>
<th>Mean Results</th>
</tr>
</thead>
<tbody>
<tr>
<td>Roll Size</td>
<td>n/a</td>
<td>1.6m x 50m</td>
</tr>
<tr>
<td>Thickness</td>
<td></td>
<td>0.16mm</td>
</tr>
<tr>
<td>Weight</td>
<td>EN 1849-2</td>
<td>94g/m²</td>
</tr>
<tr>
<td>Colour</td>
<td></td>
<td>Black / White</td>
</tr>
<tr>
<td>Water Vapour Resistance</td>
<td>EN 1931</td>
<td>44m Sd 220 MNs/g</td>
</tr>
<tr>
<td>Service Temperature</td>
<td></td>
<td>100°C</td>
</tr>
<tr>
<td>Water resistance (after ageing)</td>
<td>EN 1928</td>
<td>W1</td>
</tr>
<tr>
<td>Reaction to fire</td>
<td>EN 13501-1 BS 476 Parts 6&amp;7</td>
<td>B-s1, d0* Class 0**</td>
</tr>
</tbody>
</table>

*Tested on 12.5mm paper-faced gypsum plasterboard

**Tested on nominally 12mm thick non-combustible backing board

### Applications
- Internal fire resistance
- Suitable for use in New Build and Renovation projects
- For use in walls and ceilings where increased fire classification is required
- Provides vapour resistance and airtightness
Procheck A2, is a fire resistant, vapour and airtight membrane. Procheck A2, with it’s Class A2-s1,d0 fire classification to BS EN 13501-1, is considered non-combustible with no contribution to fire. Its composition comprises of the glass fibre backing, with a pure aluminium foil and clear lacquer coating. 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 unique 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.

<table>
<thead>
<tr>
<th>Property</th>
<th>Test Method</th>
<th>Mean Results</th>
</tr>
</thead>
<tbody>
<tr>
<td>Roll Size</td>
<td>-</td>
<td>1.5m x 50m</td>
</tr>
<tr>
<td>Weight</td>
<td>EN 1849-2</td>
<td>165 g/m²</td>
</tr>
<tr>
<td>Sd value</td>
<td>EN 1931</td>
<td>&gt;1500m</td>
</tr>
<tr>
<td>Reaction to fire</td>
<td>EN 13501-1</td>
<td>A2-s1,d0</td>
</tr>
<tr>
<td>Water tightness</td>
<td>EN 1928</td>
<td>WI</td>
</tr>
<tr>
<td>Tensile strength</td>
<td>EN 12311-1</td>
<td>MD 700 N/50mm CD 400 N/50mm</td>
</tr>
<tr>
<td>Elongation</td>
<td>EN 12311-1</td>
<td>MD 3% CD 3%</td>
</tr>
<tr>
<td>Tear resistance</td>
<td>EN 12310-1</td>
<td>MD 170N CD 130N</td>
</tr>
<tr>
<td>Thermal resistance of an adjacent airspace</td>
<td>-</td>
<td>0.606 m²K/W</td>
</tr>
</tbody>
</table>

Key Benefits
- Fire resistant to A2-s1-d0
- Water vapour diffusion tight
- Reflective material, emissivity <0.05
- Clear lacquered aluminium surface allows for low emissivity surface
- Easy to install
- Robust and able to withstand tough site conditions
- BRE approval in buildings over 18m in England and Wales, and over 11m in Scotland
Wraptite offers airtight solution for Offsite construction

The two main ways to achieve airtightness in the building envelope are internally or externally, or in other terms, ‘inside of the services zone’ or ‘outside of the services zone’. In offsite manufacture, the use of traditional internal air barriers can be more complex and costly to install, due to the need to accommodate building services such as electrical, lighting, heating and drainage systems. An internal air barrier is only as good as it’s installation. If all the service penetrations are not adequately sealed, performance will be compromised.

For many years, external air barriers have been commonly used in North American building design and construction. By moving the air barrier to the external side of the structural frame, external air barrier systems such as Wraptite allow for an almost penetration-free airtight layer, which can be installed faster and more robustly. This offers an effective but simple system comprising a self-adhesive vapour permeable air barrier membrane, plus vapour permeable sealing tape, Wraptite Corners and Wraptite Liquid Flashing, and provides effective secondary weather protection while preventing trapped moisture and air leakage. Far simpler than internal options an external air barrier system like Wraptite will maintain the envelope’s integrity, with less building services and structural penetrations to be sealed, and less room for error.

A simple, fast airtight installation
The traditional forms of VCLs and airtightness membranes will often require mechanical fixing. In the case of timber structures using steel staples, and on concrete using a separate double-sided adhesive tape. The self-adhered nature of Wraptite allows for a simple and fast installation process, minimising the use of additional sealants and tapes, and requiring no specialist contractors to achieve a robust result. This one-step solution provides both a damage-resistant air barrier layer and effective secondary weather protection in one installation process, allowing a wind and watertight envelope to be achieved more quickly than using traditional methods.

TopHat incorporates Wraptite into the design
One of the UK’s leading modular housing manufacturers TopHat has successfully incorporated Wraptite into the design of its high-quality timber-framed homes. Wraptite is a patented external air barrier membrane system, which offers manufacturers and designers of modular and off-site buildings the ability to reliably and comfortably exceed current airtightness requirements. Wraptite is the only self-adhering vapour permeable air barrier certified by the BBA and combines the important properties of vapour permeability and airtightness in one self-adhering membrane.

The A. Proctor Group provides a range of high-performance membranes to address the requirements of heat, air, moisture management within the building element, and provides comprehensive guidance to designers and manufacturers of offsite construction using modelling & analysis tools to ensure compliance and guide on best practice related to DfMA.
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
- 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 OBJECTS
Our range of Performance Specifications & BIM content, covering our Condensation Control Membranes, External Airtight Barriers, Acoustics Flooring Solutions, Ground Gas Protection Systems & Thermal Insulation range is now available in a combination of Revit Project files (.rvt), Revit Detail Component files (.rfa), Industry Foundation Class files (.ifc) & PDF format.

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
- Acoustics Floor Solutions
- External Airtight Barriers
- Ground Gas Protection
- Thermal Solutions

Get in touch for more information
www.proctorgroup.com | +44 (0) 1250 872261
contact@proctorgroup.com
“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