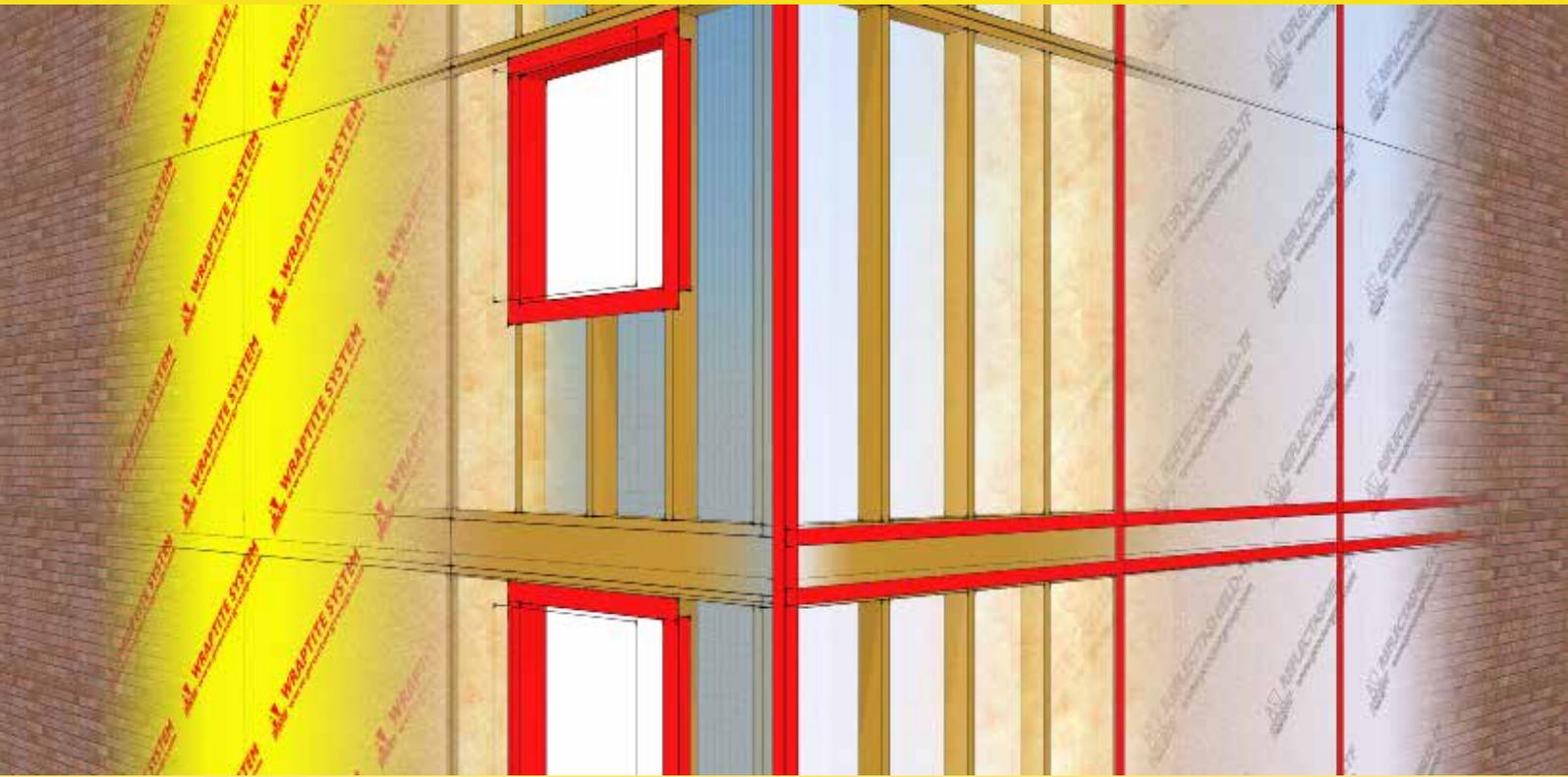


Energy Efficient Membranes

MINIMISING CONDENSATION WITHIN BUILDINGS





The A. Proctor Group Ltd, a family owned company in its fourth generation, has been providing solutions and products to the construction industry for over 50 years.

We have been developing vapour permeable membranes and vapour control layers for over 25 years, and can provide condensation control and air barrier solutions for all areas of the building envelope, across a variety of projects.

With increasing emphasis on the airtightness of the building envelope across the industry, the successful management of moisture vapour and air movement within all types of structure is more critical than it has ever been.

With our many years of experience, and a dedicated team of technical advisors, the A. Proctor Group can provide the wide range of solutions needed to meet even the most complex project requirements.



TECH LINE SERVICES & SUPPORT



IMPROVE THERMAL EFFICIENCY



COMPETITIVELY PRICED



CONDENSATION CONTROL



REFURBISHMENT AND NEW BUILDS





THE IMPORTANCE OF AIRTIGHTNESS

The increasing awareness of environmental issues and climate change in the 1980s and 90s culminated in the 1997 Kyoto Protocol, which set targets for nations to reduce carbon dioxide emissions. This, alongside EU carbon reduction targets, and the UK Government's commitment to move to zero carbon new build housing by 2016, has placed a new focus on energy efficiency across all industries.

With around 45% of UK CO₂ emissions coming from the built environment, changes to the building regulations relating to energy performance have become a regular occurrence over the last 20 years in an effort to move closer to meeting the targets.

As each new revision of the Building Regulations imposes tougher energy performance criteria on buildings, designers and specifiers are increasingly turning to air barrier membranes as a cost-effective means of stopping air leaks.

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 having emerged in the industry that discrepancies between 'as built' and 'as designed' performance are largely attributable to uncontrolled air leakage.

Build Tight – Ventilate Right

A common misconception when it comes to airtightness is that well-sealed buildings mean uncomfortable, 'stuffy' indoor environments; this is largely an effect of poor ventilation rather than airtightness itself. Buildings with very low rates of air leakage require correspondingly higher levels of ventilation as part of a balanced, holistic design approach. It is a common misconception that this increased ventilation undermines efforts to reduce air leakage, and hampers overall efficiency. However it's important to bear in mind that ventilation is controllable, and therefore can be accounted for within the overall design, whereas uncontrolled air leakage is not.



Effects of Airtightness

It is also important to remember this holistic approach when considering compliance with Building Regulations. Both reducing the rate of air leakage and increasing the thermal insulation will contribute to lowering the building's CO₂ emission rate, but the implications of each approach can be substantially different.

Air leakage is measured in m³/m²/hr - the quantity of air moving through the building fabric (m³), for a given building floor area (m²), over a given time period (hr). The measurement method commonly used is either pressurising or depressurising the building, and measuring the airflow required to maintain the test pressure (in the UK this pressure is 50 Pascals). The Building Regulations require the level of air leakage to be no greater than 10m³/m²/hr (7m³/m²/hr in Scotland), and in most cases achieving this presents little difficulty.

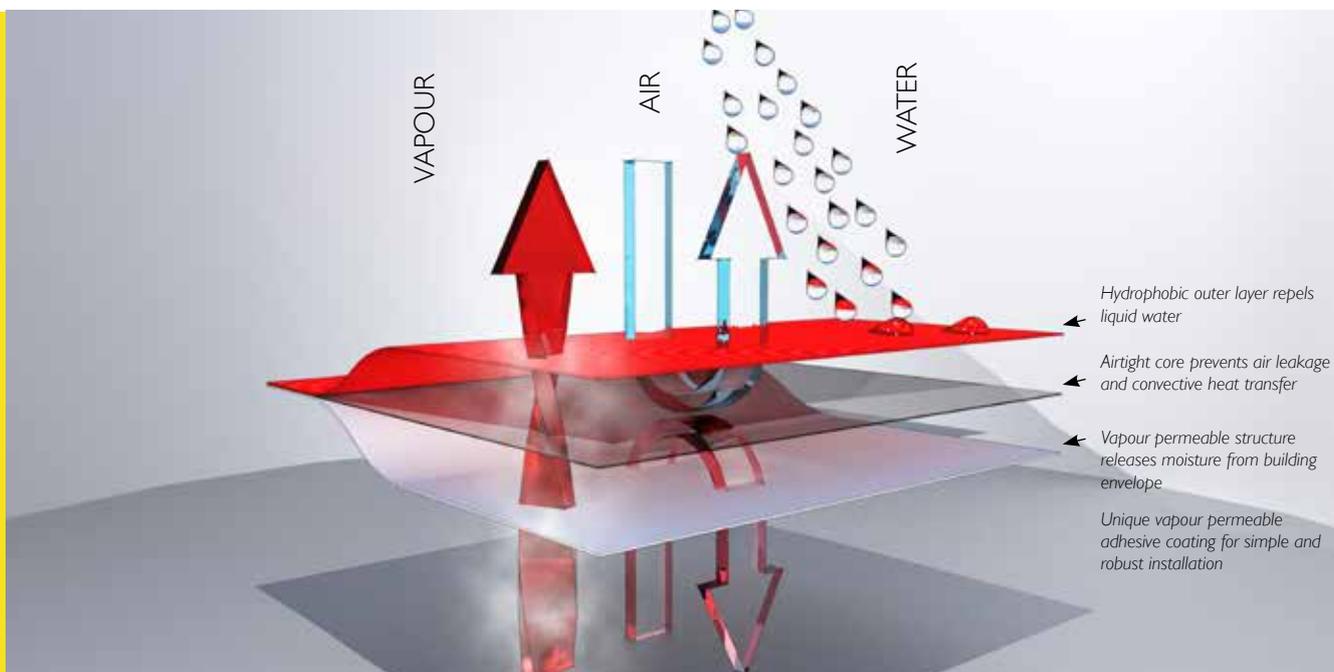
Where substantial benefits can be realised is in exceeding this base requirement. If we consider the 'notional dwelling' used within the Standard Assessment Procedure (SAP) calculation, and vary the levels of thermal insulation (in terms of U-values) and air leakage, these benefits become clear. By varying the U-value from 0.15 to 0.05, with an air leakage rate of 7, the dwelling emission rate will drop by 6.7%, but achieving this reduction in U-value will require almost three times the thickness of insulation. By contrast, retaining the 0.15 U-value, but dropping the air leakage rate from 7 to 0.5 will achieve a similar improvement in DER, but with little or no corresponding increase in thickness, allowing a reduction in building footprint, or an increase in internal space, while reducing build costs considerably.

Air Barrier Solutions from the A. Proctor Group

For over 25 years the A. Proctor Group's range of internal vapour control/air barrier membranes have provided a cost effective, traditional method of preventing air leakage. The company's knowledge and experience has been fundamental in the development of the Wraptite air barrier system, which provides superior air leakage reductions allied to a faster, simpler, and more robust installation procedure.

A major factor in the product's usefulness comes from the fact that it's located outside the structural frame. While internal air barrier systems are more than capable of meeting the most stringent airtightness requirements, they require extensive sealing to all internal penetrations and services and may require specialist accessories such as airtight sockets, switches and lighting fixtures.

By moving the air barrier to the external side of the structural frame, the Wraptite system allows for an almost penetration-free airtight layer, which can be installed faster and more robustly. Essentially a simple system comprising self-adhesive and mechanically fixed vapour permeable air barrier membranes, plus vapour permeable sealing tape, Wraptite provides effective secondary weather protection, while preventing trapped moisture and air leakage.



WRAPTITE-SA

Wraptite-SA combines important properties of vapour permeability and airtightness in one affordable self-adhering membrane. Wraptite-SA has received BBA certification (no. 15/5274) for use in both roofs and in walls behind the rain screen cladding making it an ideal choice for commercial projects with large uninterrupted facades. It is the only self-adhering vapour permeable air barrier certified by the BBA.

It fully bonds (needing no mechanical attachment) to virtually any substrate, with a key benefit being its ease of installation, negating requirement for sealants or tapes.

Wraptite-SA airtight membrane makes a significant contribution to a building's thermal performance by preventing lateral air movement, but it also contributes to a healthy living environment and a healthy building, thanks to its vapour permeability. With a rating of Sd 0.039, it provides a high degree of vapour permeability in a commercial quality, self-adhered, airtight breathable membrane.

Specifiers can have confidence that Wraptite-SA's performance is unsurpassed.

Composition

Wraptite-SA consists of a triple layer polypropylene micro-porous film laminate, with a proprietary acrylic moisture vapour permeable adhesive and silicone-coated PET release liner.

Drying Capacity

Wraptite-SA'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.

Adhesive Durability & Cost Effectiveness

- No primer required
- BBA certification no. 15/5274
- Tough facer laminate resists punctures and tears during construction
- Easy to install
- Manufactured rolled goods ensure consistent properties and performance
- Wide service temperature range
- Can be left exposed for up to 90 days (North America) or 120 days (UK) during construction*
- No VOC's

Multiple Substrate Compatibility

- Exterior Gypsum Sheathing
- Aluminium (painted or mill finish)
- OSB
- Most rigid insulation
- Cast-in-place concrete
- Rigid vinyl
- Pre-painted steel
- Galvanized metal
- Precast concrete
- Steel
- Concrete block
- Plywood



PHYSICAL PROPERTIES & PERFORMANCE

Property	Test Method	Mean Results
Roll sizes	-	1.5m x 50m
Tape Widths	-	75mm, 100mm, 150mm
Nominal Thickness	Calibrated Deadweight Micrometer	0.65mm
Basis Weight	Electronic Weigh Scale	280 g/m ²
Application Temperature	-	Air & surface minimum 0°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	EN 12572	0.039m
Water Vapour Transmission	BS 3177:1959	893 g/m ² .24hr
Peel Adhesion	-	>0.26N/mm
Tensile Strength	EN 12311-1	Mean MD 417N Mean XD 252N
Tear Resistance	EN 12310-1	Mean MD 412N Mean XD 286N
Dimensional Stability	EN 1107-2	MD -0.34% XD +0.02%
Reaction to Fire	EN 11925-2	Class 'D'
Flexibility at Low Temperature	EN 1109	No cracks at -40°C

Airtightness

Wraptite-SA

CASE STUDY

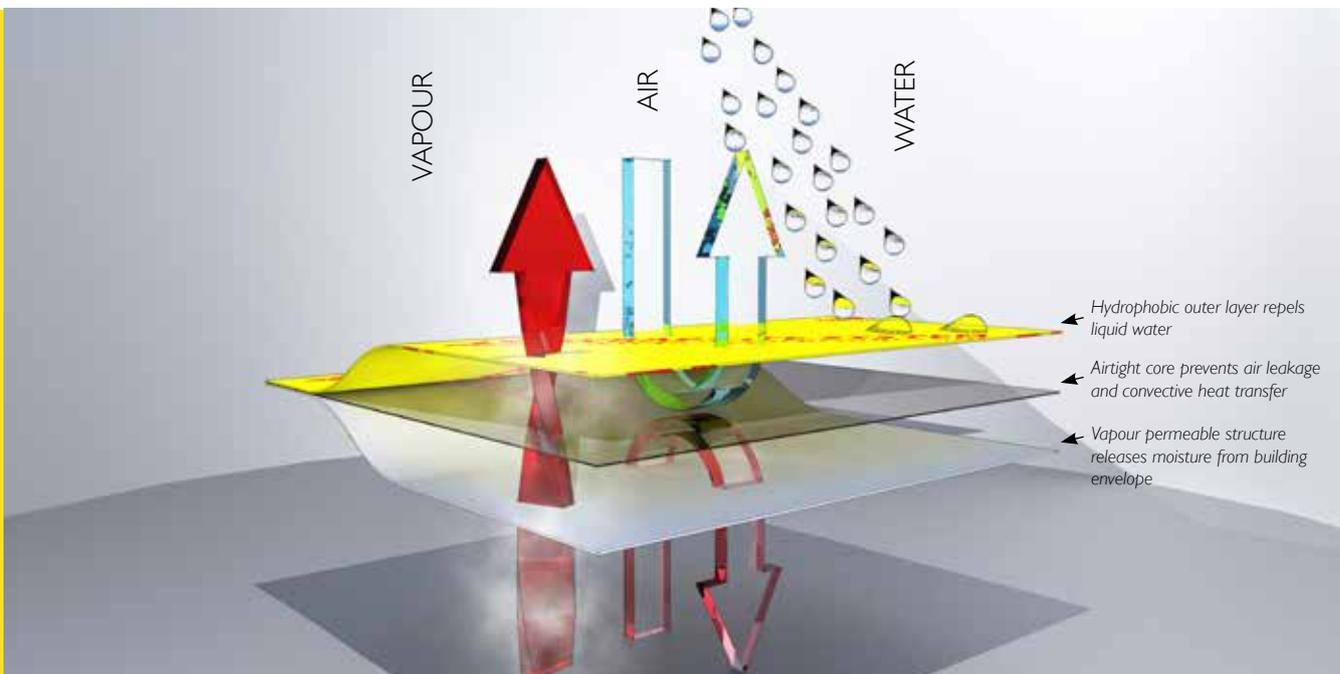
POTTON PASSIVHAUS SHOWHOUSE - 0.5 AIR CHANGES PER HOUR

Passivhaus is a very low energy construction standard that minimises a buildings requirement for heating or cooling, due to excellent thermal performance and extremely good airtightness. The UKs first permanent Passivhaus show house, has been built by Potton using the Kingspan TEK® Building System. It joins four existing show homes at their Self Build Show Centre in St Neots.

As a Passivhaus standard show house, this project required a very low level of air leakage, making Wraptite-SA the ideal choice as it significantly improves the building's thermal performance by preventing lateral air movement.

The Passivhaus standard must be demonstrated by means of an airtightness test. The air change rate must be less than or equal to 0.60ac/h (air changes per hour), under test conditions, to meet Passivhaus levels. At a recent Self Build Live event on the 4th March 2016, Potton managed to improve on their target of 0.60 ac/h (air changes per hour), to 0.5 ac/h!





WRAPTITE SYSTEM

The Wraptite system offers the ideal option for a vapour permeable air barrier:

Designed to cost effectively replace conventional breather membranes, in the traditional manner, Wraptite is a low-resistance vapour permeable airtight wall underlay, which is durable, flexible and lightweight, allowing for easy installation. It offers temporary protection against wind-driven rain, snow and dust.

The Wraptite system comprises Wraptite plus Wraptite Tape. Used together these components provide a simplified and robust method of achieving low air leakage rates, particularly when installed on site, as is typical with large scale rainscreen construction, or when sealing junctions between prefabricated building components. By reducing the likelihood of failures to meet designed airtightness levels, the Wraptite System helps ensure "as-designed" performance is achieved, helping to narrow the 'performance gap' between as-designed and actual energy performance. Failure to meet the specified targets can cause substantial reductions in the energy performance of the completed building, as has been identified in many studies of predicted versus actual building energy use.

Positioning an air barrier on the outside of the insulation rather than on the interior simplifies this process of maintaining the envelope's integrity considerably, as there are less building services and structural penetrations to be sealed. While not a common method in the UK, the A. Proctor Group's Wraptite external air barrier system provides a simple and robust solution that can be easily incorporated into existing site practices. It must be noted however that careful consideration of the specification and installation of this barrier remains critical during design and construction respectively.

Composition

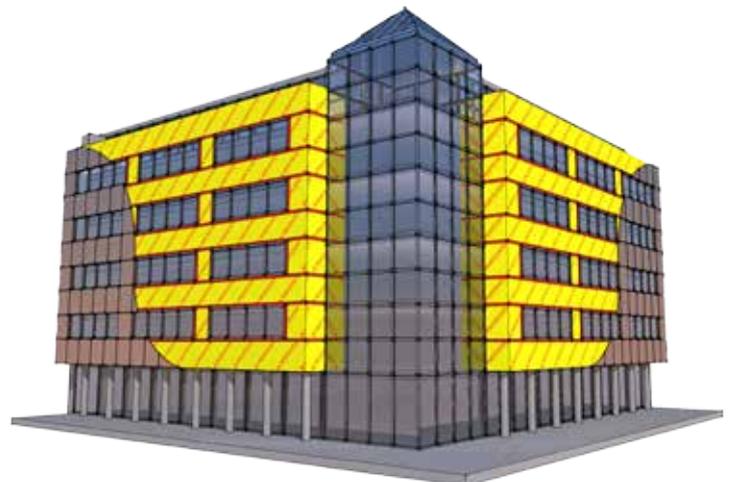
Wraptite consists of a triple layer polypropylene micro-porous film laminate.

Drying Capacity

Wraptites' 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.

Key Benefits

- Airtight yet vapour permeable
- Water resistant
- Resilient composition, which resists punctures and tears during construction
- Flexibility, facilitating ease of application and detailing
- Can be left exposed for up to 90 days (North America) or 120 days (UK) during construction*
- No VOC's
- Creates airtight seal



*Please contact the A. Proctor Group's technical department for advice on specific geographical locations

PHYSICAL PROPERTIES & PERFORMANCE

Property	Test Method	Mean Results
Roll sizes	-	1.5m x 50m
Tape Widths	-	75mm, 100mm, 150mm
Mass per unit area	EN 1849-2	92 g/m ²
Reaction to Fire	EN 13501-1	Class E-d2
Water vapour resistance Sd	EN 12572	0.029m
Water Penetration	EN 1928	Class W1 (before ageing) Class W1 (after ageing)
Tensile Strength	EN 12311-1	MD 230N XD 125N
Elongation	EN 12311-1	MD 65% XD 70%
Tear resistance	EN 12310-1	MD 75 N CD 80 N
Flexibility at Low Temperature	EN 1109	No cracking at -40°C

CASE STUDY ANGEL LANE, LONDON

Rain screen system contractor, Errigal Contracts have confidently installed Wraptite System at the newly constructed student accommodation at Angel Lane, London, thanks to its fire rating, which complies with the 'loss prevention council' insurers directive.

Wraptite which was distributed by Charles Tennant of Belfast, is a low-resistance vapour permeable air barrier wall underlay, which is durable, flexible and lightweight. Wraptite Tape is an airtight, tear resistant tape with high vapour permeability for internal and external applications. Used together these components provide a simplified and robust method of achieving improved airtightness.

Wraptite Tape was also used around the 1700 windows which required airtight detailing. Where the membrane interfaces with the windows it was essential that a good seal could be achieved between the PPC finished aluminium windows, the EPDM's and also (where necessary) the cement particle boards.





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.

It fully bonds to all standard substrates, suppressing air leakage around joints, openings and penetrations. It is also suitable for permanent airtight sealing of membrane overlaps.

Composition

Wraptite Tape consists of a triple layer polypropylene micro-porous film laminate, with a proprietary acrylic moisture vapour permeable adhesive and silicone-coated PET release liner.

Drying Capacity

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.

Key Benefits

- Airtight yet vapour permeable
- Resilient composition, which resists punctures and tears during construction
- Flexibility, facilitating ease of application and detailing
- Wide operating temperature range (-40°C to +100°C)
- Can be left exposed for up to 90 days (North America) or 120 days (UK) during construction*
- No primer required
- No VOC's

Multiple Substrate Compatibility

- | | | | |
|-----------------------------|--------------------|-------------------------|--------------------------|
| • Exterior Gypsum Sheathing | • Aluminium | • Most rigid insulation | • Cast-in-place concrete |
| • Pre-painted steel | • Galvanized metal | • OSB | • Rigid vinyl |
| • Precast concrete | • Steel | • Concrete block | • Plywood |

(Additional substrate compatibility available upon request.)

Vapour Permeability

With an Sd rating of 0.039, Wraptite tape provides a highly vapour permeable, but fully airtight performance for multiple applications and conditions.

These crucial characteristics allow moisture vapour to escape the structure easily whilst maintaining the integrity of the building envelope (see following page for info on applications).

*Please contact the A. Proctor Group's technical department for advice on specific geographical locations



REFLECTIVE MEMBRANES: INNOVATIONS IN THERMAL EFFICIENCY

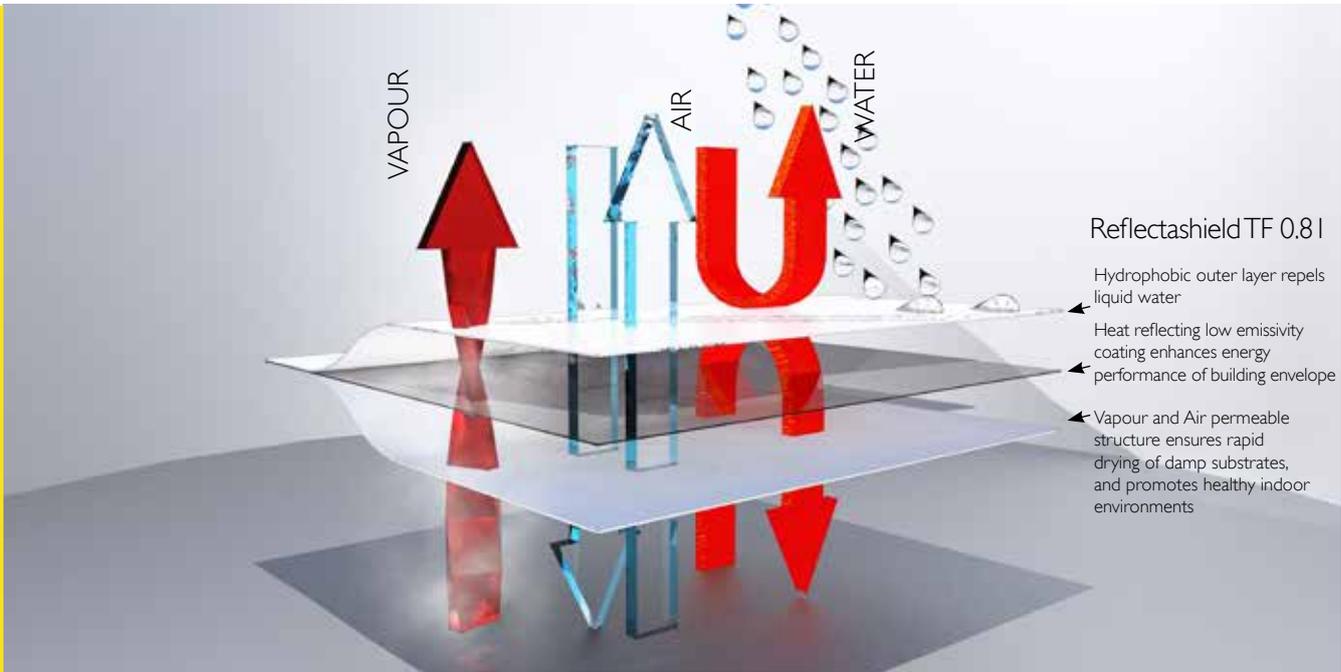
As Building Regulations have tightened significantly towards the end of meeting UK government carbon reduction targets, construction material technologies have evolved to keep pace. One of the more innovative products to be developed for improving the key criteria of thermal performance is reflective insulation. It has gone from being virtually unheard of a few decades ago to being incorporated in almost every major house-builder's standard designs. By combining advanced manufacturing with physics and technology developed for the aerospace industry, reflective insulation membranes allow the thermal performance of timber frame structures to be increased without a corresponding increase in wall thickness or weight.

Reflective insulation, a form of 'radiant barrier', works by altering the extent to which surfaces absorb and emit heat in the form of infra-red radiation, reducing the effect of solar heat on buildings and reducing heat loss in winter. Reflective membranes are referred to as "Low Emissivity" or "Low-E", i.e. better performing, while non-reflective materials (such as bricks or timber) are "High Emissivity".

By applying a reflective coating to a vapour control layer (on the warm side of the insulation, facing inwards) the ability of the external wall to absorb heat from the internal spaces is inhibited, (this reduced rate of heat flow being expressed as a U-value). On the cold-side of the insulation on the other hand (facing outwards), the reflective breather membrane reduces the surface's ability to emit heat. Heat that is not absorbed or emitted is reflected back inwards, and somewhat counter-intuitively the reflective surface does not need to face the heat source for the benefits to be given. The only requirement is that the surface faces an airspace, in order to maximise the proportion of heat transfer that takes place by radiation (as opposed to conduction).

Testing

The performance of the A. Proctor Group's range of breathable reflective membranes has been determined using the 'guarded hotbox' test as defined in BS EN ISO 8990, a long-established and widely-used method of determining insulation performance. Conducted by the renowned National Physical Laboratory at Teddington, in South West London, this method gives the closest approximation possible (under lab conditions) to "real world" membrane performance, and is fully accredited and certified by BM-TRADA.



Reflectashield TF 0.81

- Hydrophobic outer layer repels liquid water
- Heat reflecting low emissivity coating enhances energy performance of building envelope
- Vapour and Air permeable structure ensures rapid drying of damp substrates, and promotes healthy indoor environments

REFLECTASHIELD TF 0.81

Reflectashield TF 0.81 is a vapour permeable low emissivity membrane for use externally on timber frame buildings. As such to maximise the thermal efficiency of the membrane the time of exposure should be kept to a minimum. However the membrane will maintain the function of a breather membrane in terms of water hold out for up to three months exposure. Reflectashield TF 0.81 must be covered as soon as practically possible on completion of installation. Any damaged areas should be repaired or replaced before completion.

The A. Proctor Group is constantly reviewing its product portfolio to keep up with current legislation. The Group has tested Reflectashield TF at the National Physics Laboratory (NPL), with the product recording a thermal resistance of 0.81 m²K/W. Reflectashield TF 0.81 also complies with the vapour resistance requirements set out by BS 4016, BM-TRADA, and the NHBC. Current legislation requires a breather membrane to have a vapour resistance not greater than 0.60 MNs/g; Reflectashield TF 0.81 has a vapour resistance of 0.41 MNs/g.

PHYSICAL PROPERTIES

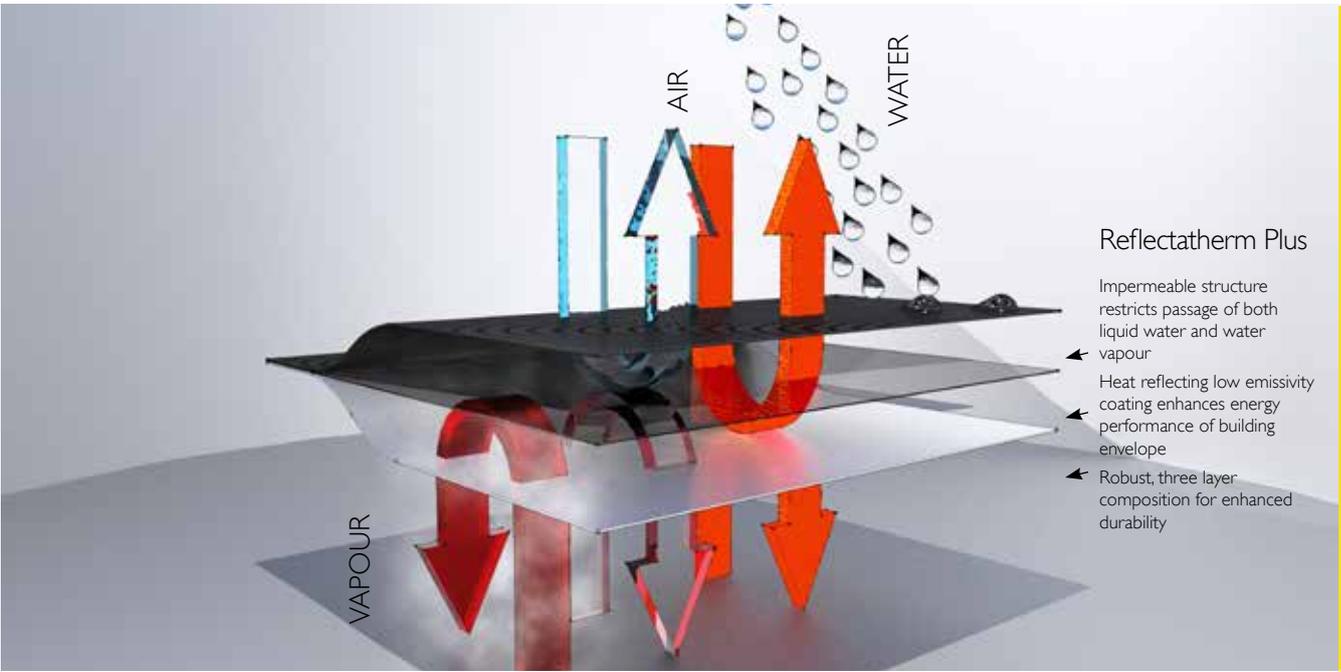
Property		Test Method	Mean Results	
Roll Sizes		n/a	1.45m x 50m 2.7m x 100m	
Mass per unit area		EN 1849-2	134g/m ² (+/- 13 g/m ²)	
Reaction to Fire		EN 13501-1	Class D*	
Water vapour resistance Sd		EN 1931	0.083 m (+/-0.011)	
Water penetration		EN 1928	Class W2 (Before and After ageing)	
Tensile strength	Before ageing:	EN 12311-1	MD 225N	CD 115N
	After ageing:		MD 210N	CD 110N
Elongation	Before ageing:	EN 12311-1	MD 40% (+/-20%)	CD 75% (+/-20%)
	After ageing:		MD 30% (+/-20%)	CD 35% (+/-20%)
Tear resistance		EN 12310-1	MD 240N	CD 235N
Flexibility at low temperature		EN 1109	No cracking at minus 40°C	
Air Permeability		EN 12114	9.3 m ³ /m ² /hr (at 50 Pa)	

Key Features

- R value 0.81 (tested by NPL)
- Competitively priced
- Enhanced foil surface
- Unique patented three layer composition
- Low vapour resistance - complies with BS4016, BM-TRADA and NHBC requirements
- Water resistant
- High strength to weight ratio
- Improved thermal resistance
- Roll sizes: 1.45m x 50m
2.7m x 100m
- UK manufactured ensuring consistent supply
- Custom printed material available on request



*When tested to EN 11925-2



REFLECTATHERM PLUS

Reflectatherm Plus is a reflective, high resistance vapour barrier for internal walls, ceilings and floors, specifically designed to enhance the thermal performance 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. In floors the product is placed on top of the structural decking or insulation (where present) and below any screed or sensitive floor coverings. Adjacent sheets should be lapped by 150mm and sealed with a suitable tape. Penetrations caused by services must be minimised to ensure effectiveness, and all joints need to be sealed.

PHYSICAL PROPERTIES

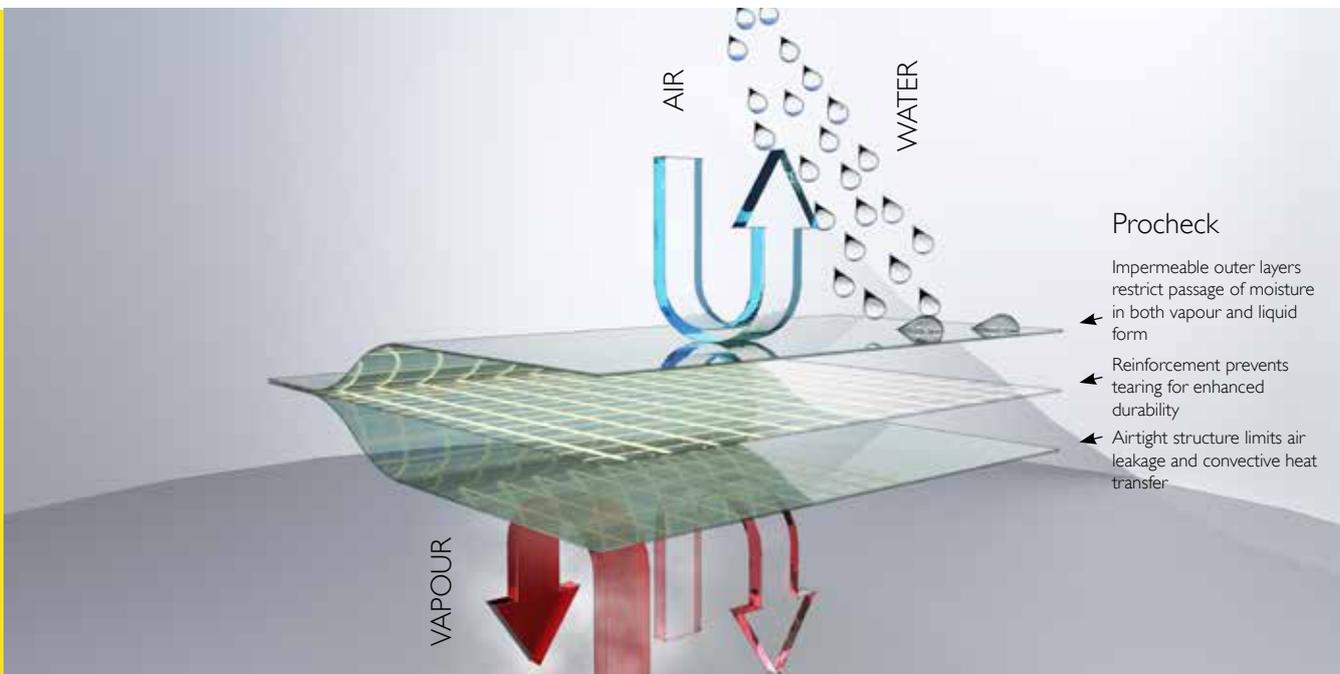
Property		Test Method	Mean Results	
Roll Size		n/a	1.5m x 50m 2.7m x 100m 3m x 100m	
Mass per unit area		EN 1849-2	142g/m ² (+/- 10 g/m ²)	
Reaction to Fire		EN 11925-2	Class E*	
Water vapour resistance Sd		EN 1931	150m	
Vapour resistance		EN 1931	750 MN/sg	
Water penetration		EN 1928	Class WI (Before and After ageing)	
Tensile strength	Before ageing:	EN 12311-1	MD 255N	CD 200N
	After ageing:		MD 255N	CD 175N
Elongation		EN 12311-1	MD 65% (+/-20%)	CD 75% (+/-20%)
Tear resistance		EN 12310-1	MD 164N	CD 157N
Flexibility at low temperature		EN 1109	No cracking at minus 40°C	
Vertical air cavity - horizontal heat flow		NPL Test	0.79 (m ² K)/W	
45 degree air cavity - upward heat flow		ISO 15099 + NPL test	0.61 (m ² K)/W	
Horizontal air cavity - upward heat flow		NPL Test	0.58 (m ² K)/W	
Horizontal air cavity - downward heat flow		BS EN ISO 6946 + NPL test	1.41 (m ² K)/W	

Key Features

- High vapour resistance
- Improved airtightness
- Creates useful service void
- Creates an unbroken vapour control layer
- Improved thermal resistance
- Roll sizes: 1.5m x 50m
2.7m x 100m
3m x 100m
- Vapour resistance of 750 MNs/g
- Helps meet the requirements of the Part L in England & Wales, and Section 6 in Scotland
- UK manufactured ensuring consistent supply



*When tested to EN 11925-2 over a rock wool substrate



THE IMPORTANCE OF VAPOUR CONTROL

It has long been recognised that the correct management of moisture vapour within buildings is an important aspect of ensuring the longevity of not only the building fabric, but also the health of the occupants. As today's structures become increasingly better insulated, more airtight, and more energy efficient, taking management of moisture into account in the design process becomes more critical. The aim being not only to ensure the specification meets the design criteria, but also that it provides a durable and fit for purpose environment throughout the building's lifespan.

In the past, buildings were often able to rely on the 'natural ventilation' provided by draughty, poorly sealed doors and windows, which in combination with unsealed flues and chimneys for open fires provided an effective means of removing moisture vapour; at the expense however of energy efficiency.

As energy performance has grown to be a more important aspect of building design, measures such as central heating and draught proofing have become more prevalent, which in turn has limited the routes by which airborne moisture vapour can escape. This moisture will remain in its relatively harmless airborne vapour state provided the temperature remains above a certain value, known as the 'dew point'. Below this temperature however, the air will lose its ability to retain the water vapour; and it will revert to its liquid state; this process is known as condensation.

If not adequately mitigated, this condensation will occur within the habitable space, or within the fabric of the wall and roof elements. If left unresolved (or worse, if undetected) the resultant liquid water condensation can lead to structural problems such as warping of timber; corrosion of steel, or damage to insulation, decorative finishes and building services. Trapped moisture can also lead to mould growth, presenting a substantial risk to the health of the building's occupants, and can ultimately lead to expensive and complex remedial action, which can be hugely disruptive to occupants.

In order to prevent such problems, designers must holistically consider various aspects of the building's design and eventual purpose, to ensure the correct balance of energy efficiency and moisture management is achieved.

SOURCES OF MOISTURE

Construction Moisture

From the very start of a building's life, moisture associated with construction such as wet concrete, plaster and timber can take months or even years to dry completely. This can lead to particularly elevated moisture vapour levels during initial occupancy, which designers must account for. With a typical 150 mm concrete floor slab containing around 27 litres of water per square metre, this is not a insignificant issue, and the result is that instances of condensation reported by building occupants are often higher in the initial period after completion.

Building Occupancy

After this drying out has occurred, the moisture produced by the occupants must also be accounted for. It has been estimated that people typically lose around 1.2 litres of water per day through perspiration and exhalation; a substantial proportion of the total vapour load, particularly where large groups of people gather; such as in schools, offices or sports facilities.



Domestic functions such as cooking, cleaning and washing can also produce large amounts of water vapour (steam), leading to higher condensation risks in kitchens, bathrooms and laundries. Other building uses such as industrial processes or indoor swimming pools also create their own moisture load issues which must be addressed.

Condensation Risks

The most important success factor in the control of condensation is properly assessing the risk present in a given project. The environmental conditions within a structure are typically measured in terms of internal temperature ($^{\circ}\text{C}$) and relative humidity (%RH), and combining these properties gives the 'vapour pressure' of a particular environment. The higher the vapour pressure, the higher the condensation risk, but as this relationship is non-linear, an increase in either temperature or RH can dramatically increase the vapour pressure. Cooler, drier environments such as warehouses will tend to have lower vapour pressures (and are hence classed as 'low risk') while, for example, swimming pools will typically be warmer and more humid, and present a higher risk.

Using this information, together with details of building fabric, it is possible to model how vapour will move through the structure, predict where the dew point will occur, and assess the risk of problematic condensation.

Reducing Condensation Risks

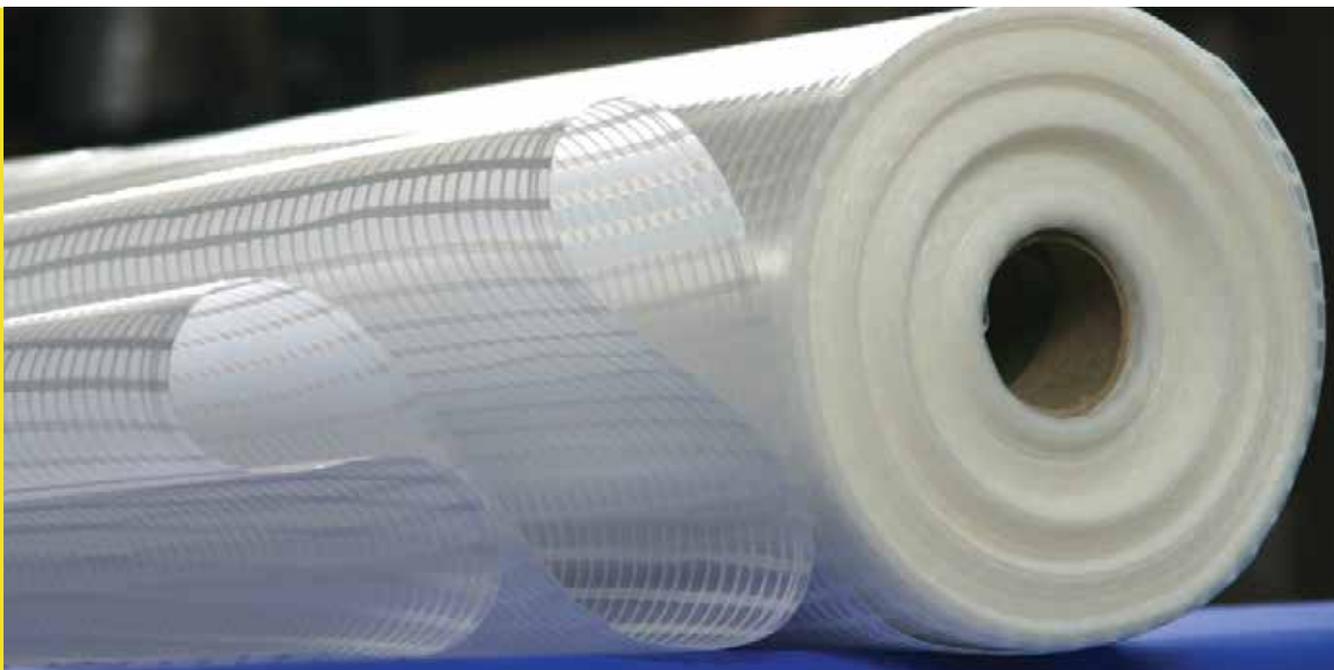
There are a number of ways to reduce the potential for condensation to occur. The most effective method is to reduce the vapour pressure in the internal spaces using ventilation. In its simplest form, this can mean opening windows, or at the more complex end of the spectrum, mechanical heat recovery systems. However, care must be taken that the ventilation provisions provided are not only capable of reducing the internal pressure sufficiently, but also that they do so without unduly impacting the energy efficiency of the building.

In addition to providing ventilation, it is also important to provide additional protection to the building fabric, and a dual solution will provide maximum effectiveness. Firstly, a vapour control layer on the warm (internal) side of the fabric insulation will limit the ability of moisture vapour to permeate into the fabric of roof and wall elements. VCL membranes can also help improve the airtightness of the dwelling if installed correctly and robustly.

As well as the VCL limiting the ingress of moisture, it is also important to ensure any vapour that does pass through it, or any construction moisture already present, has a means of escaping. On the cold (external) side of the fabric insulation, a vapour permeable membrane is used to provide temporary and/or secondary weather protection to the structure, while ensuring moisture is not trapped. Airtight vapour permeable membranes can also provide a simple and robust air barrier, as there are typically less penetrations on the external side. (See Wraptite information).

Vapour Control Solutions from the A. Proctor Group

Over the last 25 years, the A. Proctor Group's range of vapour control solutions has been consistently developed to specifically meet the needs of our industry partners. From the economic Procheck 125 to the high performance Profoil 861, our range of robust, reinforced vapour control/air barrier membranes can meet even the most onerous requirements. Our in-house technical support team can also provide condensation risk assessments to ensure the correct membrane is specified for each individual project.



PROCHECK 125

Proccheck 125 is a lightweight reinforced polyethylene vapour barrier which can be utilised in a variety of commercial applications. Proccheck 125 can be utilised where very high moisture vapour resistance is not a necessity but a strong, durable airtight membrane is.

Key Features

- Thickness 0.35mm
- 350 micron
- Tensile MD = 190 N/50mm
CD = 130 N/50mm
- Nail tear 150 N / 190 N

Advantages

- Vapour resistance - 126 MNs/g
- Reinforced
- Translucent
- Low / Medium Risk Applications eg. infrastructure, light commercial buildings

PROCHECK 300

A lightweight, 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 good resistance to tears and punctures.

Key Features

- Thickness 0.29mm.
- 1100 gauge.
- 290 micron.
- Tensile 3.4/2.4 kN/m.
- Nail tear 60N/60N.

Advantages

- Vapour Resistance - 336 MNs/g.
- Reinforced.
- Translucent.
- Unaffected by Chlorine.
- Low Risk Applications eg. heated warehouses.

PROCHECK 500

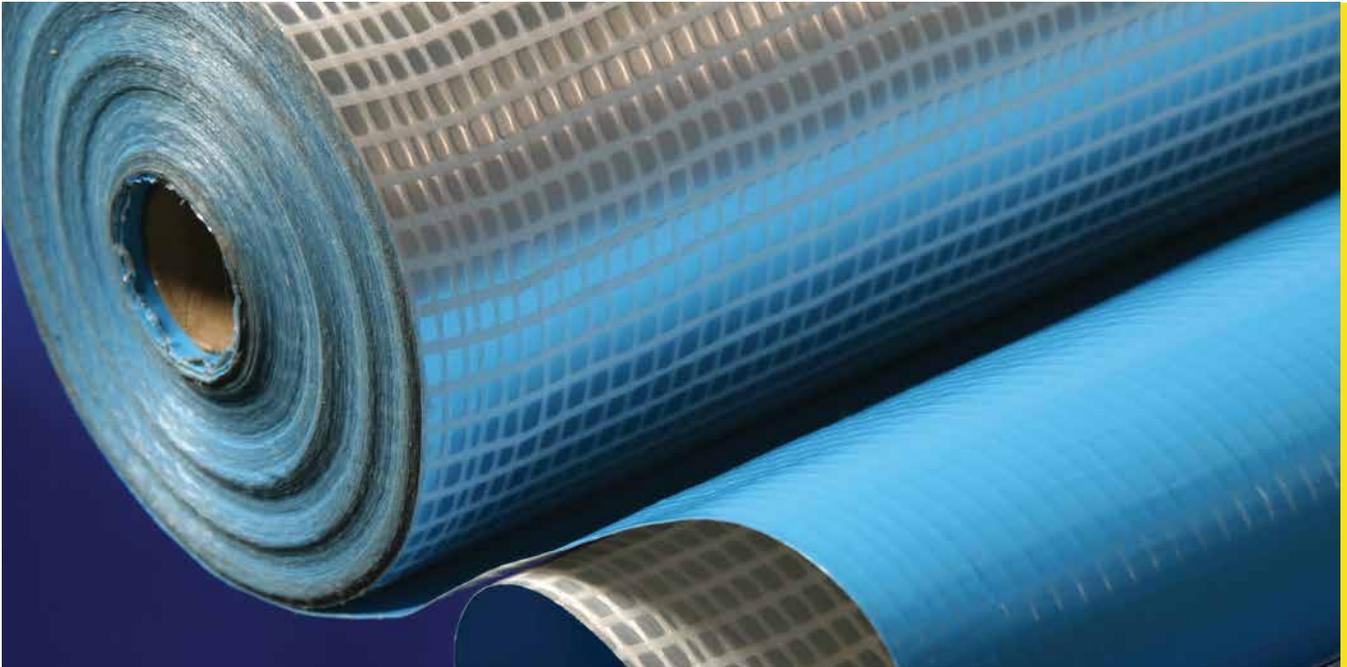
A strong reinforced polyethylene vapour control layer with good vapour resistance. The woven extruded polypropylene multifilament scrim reinforcing provides improved nail tear resistance. The sheet is translucent to ease the installation and later inspection of support arrangements, and is the grade utilised by many leading system manufacturers.

Key Features

- Thickness 0.37mm.
- Gauge 1600.
- 400 micron.
- Tensile 6.2/5.8 kN/m.
- Nail Tear 180/170N.

Advantages

- Vapour Resistance - 533 MNs/g.
- Reinforced.
- Unaffected by chlorine.
- UV stabilised.
- Low/Medium Risk eg offices, school, houses.
- Translucent.



PROFOIL 86 I

A heavyweight, reinforced vapour control layer with an aluminium foil core to give a high water vapour resistance. The aluminium foil is protected on both faces by polyethylene for corrosive situations such as chlorine in swimming pools.

Key Features

- Thickness 0.4mm.
- Gauge 1600.
- 400 micron.
- Tensile 7.3 kN/m.
- Nail Tear 215/182N.

Advantages

- Vapour Resistance - >7000 MNs/g.
- Unaffected by chlorine.
- UV stabilised.
- Aluminium Foil.
- High Risk - Swimming Pools, Textile Factories.

PHYSICAL PROPERTIES

Property	Procheck 125	Procheck 300	Procheck 500	Profoil 86 I
Thickness	0.35mm	0.29 mm	0.37 mm	0.4 mm
Weight	90g/m ²	152g/m ²	236 g/m ²	310 g/m ²
Roll Length	50m	50m	50m	50m
Roll Width	2m	2m	2m	2m
Colour	Translucent	Translucent	Translucent	Blue / Silver
Vapour Resistance	126MNs/g Sd 25m	336MNs/g Sd 67m	533MNs/g Sd 107m	>7000 MNs/g Sd 1400m
Classification	Low / Medium risk	Low risk	Low/Medium risk	High risk

SHINY NEW AFFORDABLE HOMES

Balfour Beatty have installed Reflectashield TF 0.81 on their new timber frame development in Winterfield & Stepsile Estate, West Malling, Kent.

The Russett Homes development will provide affordable housing with 34 flats, 18 houses and 4 bungalows in the area.

Reflectashield TF 0.81 is the highest performing reflective membrane in its class and is specifically designed to enhance the thermal performance of timber and steel frame structures. It complies with the vapour resistance requirements set out by BS 4016, TRADA and the NHBC. The existing legislation requires a breather membrane to have a vapour resistance not greater than 0.60 MNs/g. Reflectashield TF 0.81 has a vapour resistance of 0.44 MNs/g.



DUBAI TRAM PROJECT

Client: RTA
Consultant: Systra
Main contractor: Besix

The A. Proctor Group have supplied approximately 30,000m² of Profoil 861 to Arabian Profiles for phase 1 of the Dubai Tram project. Due for completion on 1st November 2014, the first phase is from Al Sufouh to the Marina.

Profoil 861 is a heavyweight reinforced vapour control layer with an aluminium foil core to give a high water vapour resistance. The woven extruded polypropylene multifilament scrim reinforcement gives good resistance to tears and punctures. The aluminium foil is protected on both faces by polyethylene for corrosive situations, such as chlorine in swimming pools.

The Dubai Tram (previously the Al Sufouh Tram) system was designed to form an integral part of the Dubai transport network, linking the Dubai Metro and the Palm Monorail.



AIRTIGHTNESS MOVES OUTSIDE

Wraptite-SA has been supplied to the recent new development at Drums of Park, Cornhill, Aberdeenshire.

The self-adhering Wraptite-SA enabled Sylvan Stuart of Inch, Aberdeenshire to easily install the membrane onto the walls compared to traditional methods. The self-adhesive qualities meant that savings were made by eliminating the need for flashings and other sealants around the windows and doors.

Wraptite-SA airtight membrane prevents lateral air movement enhancing the buildings thermal performance. It also provides high vapour permeability in a continuously sealed, self-adhered, airtight membrane. In this instance, a result of better than 2.5m³/m²/hr was achieved.

The membrane fully bonds (no mechanical attachment) to almost any substrate for improved airtightness and ease of installation, offering labour savings to any project.

Wraptite-SA'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.



IMPROVED AIRTIGHTNESS WITH WRAPTITE - SIMPLE!

Rain screen system contractor, Errigal Contracts have confidently installed Wraptite System at the newly constructed student accommodation at Angel Lane, London, thanks to its fire rating, Class E-d2. This fire rating complies with the 'loss prevention council' insurers directive.

Wraptite which was distributed by Charles Tennant of Belfast, is a low-resistance vapour permeable air barrier wall underlay, which is durable, flexible and lightweight. Wraptite Tape is an airtight, tear resistant tape with high vapour permeability for internal and external applications. Used together these components provide a simplified and robust method of achieving improved airtightness.

Wraptite Tape was also used around the 1700 windows which required airtight detailing. Where the membrane interfaces with the windows it was essential that a good seal could be achieved between the PPC finished aluminium windows, the EPDM's and also (where necessary) the cement particle boards.



UNIQUE SELF BUILD SITE IN ABERDEENSHIRE

The A. Proctor Group recently supplied Roofshield, their unique air and vapour permeable pitched roof underlay to an exclusive self build project. To complement the specification, for the walls, Reflectashield TF 0.81 high performance breather membrane was used on the outside face with Reflectatherm Plus vapour barrier on the inside which assisted in achieving a U-value for the walls of 0.12 W/m²K. The roof panels also had Reflectatherm Plus vapour barrier on the inside with Roofshield on the outside, contributing toward a final U-value for the roof of 0.11 W/m²K.

Scotframe, in association with Hybrid Build Solutions, have recently started work on a "ground breaking" new house project at Oyne near Inverurie in Aberdeenshire

The project involved manufacturing for the very first time, Hybrid Build Solution's "CLTherm" concept, which is a combination of CLT (Cross Laminated Timber) slab and Scotframe Val-U-Therm panels. The house has some very distinct features and will showcase a large number of CLT and Val-U-Therm panels, pushing the boundaries in efficient construction. This is the first of its kind, not only in terms of "CLTherm" but also a real hybrid construction using all product types. Air-tightness was also a key requirement on this project.



SCOTHAUS LOANHEAD PROJECT

Scothaus are known to 'design with the future in mind' and they have been working closely with Eskgrove Homes in Loanhead.

The 'Dunkeld' house type was recently constructed and Wraptite Tape was used at the mid floor conjunction in lieu of a separate air barrier membrane which had been used in previous projects.

After installation, the house had an airtightness test carried out by Eskgrove Homes and they were delighted to report that 0.54 air changes per hour had been achieved which is better than Passivhaus standards.

Blair Higgins of Scothaus commented " we are continually developing enhancements to the Scothaus system to further improve the airtight performance and speed up on-site operations. Using Wraptite has allowed us to achieve excellent airtightness and save on standing time for cranes, as the tape can be fitted retrospectively after the actual erection."





“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



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