DUPONT™ Tyvek®

Technical Manual – Walls and Floors

DuPont™ Tyvek® & DuPont™ AirGuard®

Membranes, Tapes and Accessories








Product Portfolio

DuPont Performance Building Solutions

DuPont™ Tyvek® roofing underlays

- Tyvek® Supro / Tyvek® Supro Plus
- Tyvek® Metal

Medium to High Occupancy buildings .e.g. Health, Education, Residential ,Commercial, Leisure...

DuPont™ Tyvek® and DuPont™ AirGuard® accessories

•• Tyvek® Acrylic Tape with split-release liner	•• Tyvek® FlexWrap NF Tape	• DuPont™ Insta Stik™
•• Tyvek® Acrylic Tape	•• Tyvek® FlexWrap EZ Tape	• DuPont™ Great Stuff™
•• Tyvek® Metallised Tape	• DuPont™ AirGuard® Tape	• DuPont™ Froth-Pak™
•• Tyvek® Double Sided Tape	• DuPont™ AirGuard® Sealant	
•• Tyvek® Butyl Tape	•• Tyvek® Window/Plastering tape	
• Tyvek® UV Façade Tape	• DuPont™ AirGuard® FR System Tape	

• External application
• Internal application

Products and Technical Support for all Building Types from low occupancy, low level buildings to high occupancy, high rise buildings, on-site and off-site construction

DuPont™ AirGuard® air & vapour control layer (AVCL) and DuPont™ Tyvek® AirGuard® Smart (AVCL) membranes

- DuPont™ AirGuard® Control
- DuPont™ AirGuard® Reflective
- DuPont™ AirGuard® Reflective E
- DuPont™ Tyvek® AirGuard® Smart
- DuPont™ AirGuard® A2 FR fire retardant AVCL

(For use in the internal wall lining)

Low Occupancy buildings .e.g. Detached, Semi-detatched, Terraced

DUPONT™ Tyvek®

DuPont™ Tyvek® breather membranes solutions for wall constructions

- Tyvek® Trifecta™
- Tyvek® FireCurb® breather membrane
- Tyvek® StructureGuard™
- Tyvek® Housewrap
- Tyvek® Reflex
- Tyvek® UV Façade/Tyvek® UV Façade Plus

(For use in the external wall lining)

Product Data

	Acrylic Tapes				
	Tyvek® Acrylic Tape	Tyvek® Acrylic Tape with split-release liner	Tyvek® Metallised Tape	Tyvek® UV Facade Tape	Tyvek® Double Sided Tape
Product Style Code	2060B	2060B	2060M	1312F	1310D
					
Product Type	**Single-Sided**	**Single-Sided**	**Single-Sided**	**Single-Sided**	**Double-Sided**
Composition	Spunbonded polyethylene /single sided acrylic adhesive	Spunbonded polyethylene /single sided acrylic adhesive	Spunbonded polyethylene / single sided acrylic adhesive / metallised paper release liner	Single-sided acrylic tape / high UV-stabilised Polypropylene	PES/PVA-grid / acrylic adhesive / paper liner
Thickness (mm)	0.3	0.3	0.3	0.7	0.15
Weight (g/m²)	320	220	320	410	220
Roll width (mm)	75	60	75	75	50
Roll length (m)	25	25	25	25	25
Roll weight (kg)	0.62	0.45	0.62	0.7	0.3
Rolls/Tubes/Bottles per pallet/box	8	10	8	8	12
Internal use	X	X	X		X
External use	X	X	X	X	X
Overlaps and overall repair: DuPont™ Tyvek® underlays for roof (EN13859-1)	●	●	●	●	●
Overlaps and overall repair: DuPont™ Tyvek® underlays for walls (EN13859-2)	●	●	●	●	●
Overlaps and overall repair: DuPont™ Tyvek® UV Facade (EN13859-2 with open joints)				●	●
Overlaps and overall repair: DuPont™ AirGuard® AVCL all applications (EN13984)	●	●	●	●	●
Material compatibility and recommended use: Masonry / concrete / render (smooth)	●	●	●	●	●
Material compatibility and recommended use: Brick / block / concrete / render (rough)	●	●	●	●	●
Material compatibility and recommended use: Plasterboard	●	●	●	●	●
Material compatibility and recommended use: Eaves Carrier					●
Material compatibility and recommended use: Window / door frames (PVC, Wood, Aluminium)	●	●	●	●	●
Material compatibility and recommended use: OSB & Wood fibre	●	●	●	●	●
Material compatibility and recommended use: Timber (rough, sawn)	●	●	●	●	●
Material compatibility and recommended use: Timber (planed)	●	●	●	●	●
Material compatibility and recommended use: Metal (aluminium, steel, copper, ...)	●	●	●	●	●
Material compatibility and recommended use: Construction membranes (PE, PVC, PP, PES, Alu, ...)	●	●	●	●	●
Penetrations & other applications: Pipe penetrations (plastic & metal)	●	●		●	
Penetrations & other applications: Wiring / cable penetrations	●	●		●	
Penetrations & other applications: Around electrical sockets	●	●		●	
Penetrations & other applications: Windows & Doors to timber frame (inside)	●	●			
Penetrations & other applications: Windows & Doors to timber frame (outside)	●	●		●	
Penetrations & other applications: Windows & Doors to bricks & blocks (inside) *	●	●			
Penetrations & other applications: Windows & Doors to bricks & blocks (outside) *	●	●		●	
Penetrations & other applications: Plasterable or under rendering *					
Penetrations & other applications: Temporarily fixing AVCL to rafters					●

* Necessity for primer application (Yes/No): see under material compatibility and recommended use

■ recommended to use primer - ● recommended and designed for - ● works out properly but not designed for

				Butyl Tapes			Other
Tyvek® Double Sided Tape (detailing)	Tyvek® Window Tape	DuPont™ AirGuard® Tape	DuPont™ AirGuard® FR System Tape	Tyvek® Butyl Tape	FlexWrap NF	FlexWrap EZ	DuPont™ AirGuard® Sealant
1310D	1310PT	1310V	1310FR	1311B	FLEXNF	2064FW	1211S
							
Double-Sided	**Single-Sided**	**Single-Sided**	**Single-Sided**	**Double-Sided**	**Single-Sided**	**Single-Sided**	**Cartridge**
PES/PVA-grid / acrylic adhesive / paper liner	PET/PA film/acrylic adhesive / PP liner	PE film / acrylic adhesive / PP liner	Glassfibre & Aluminium / acrylic adhesive / paper liner	100% butyl mastic / siliconised paper liner	A crimped DuPont™ Tyvek® top sheet / butyl mass	A crimped DuPont™ Tyvek® top sheet / butyl mass	
0.15	0.3	0.3	0.15	1.2	1.6	1.6	310ml
220	300	375	215	1560	1200	1200	
20	80 150	60	75	50 20	152 228	60	
25	25	25	25	30	23	10	
0.15	0.6 1.13	0.6	0.57	2.5 1.0	4.4 7.5	1.1	
10	6 4	10	20	4 8	1	3	20
X	X	X		X	X	X	X
	X			X	X	X	
	●			●	●	●	
	●			●	●	●	
	●			●	●	●	
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●				●			

Application table DuPont membranes

Applications	Tyvek® Trifecta™ A2 breather membrane	Tyvek® Supro / Tyvek® Supro Plus	Tyvek® Metal	Tyvek® Housewrap	Tyvek® Structure-Guard™	Tyvek® FireCurb®	Tyvek® Reflex	Tyvek® UV Façade / Tyvek® UV Façade Plus	AVCLs: DuPont™ AirGuard® Control for internal use only (internal lining)	AVCLs: DuPont™ AirGuard® Reflective for internal use only (internal lining)	AVCLs: Tyvek® AirGuard® Smart for internal use only (internal lining)	AVCLs: DuPont™ AirGuard® A2 FR AVCL for internal use only (internal lining)
Pitched roofing												
Tiled/Slated roofs												
Supported		●							●	●	●	● ●
Unsupported		●							●	●	●	● ●
Metal roofs												
Profiled cladding		●							●	●	●	● ●
Standing seam		●	●							●	●	● ●
Scottish boarded roofs		●							●	●	●	● ●
Below solar panels[2]		●							●	●	●	● ●
Walls												
Timber frame	●	●		●	●	●	●	●	●	●	●	● ●
Ventilated façades for highrise buildings	●					●						● ●
Open cladding façade (low rise)								●	●	●	●	● ●
Metal frame (low rise)	●	●		●	●	●	●	●	●	●	●	● ●
Higher fire class requirements	●					●						● ●

● : Applicable. Before using check with local regulations
● : Highly recommended to improve energy efficiency

Introduction

Over 30 years ago , the DuPont™ Tyvek® family of Weather Resistant Barrier (WRB) and superior building performance membranes were introduced into the UK and Ireland construction markets. The inherent qualities of the DuPont™ Tyvek®, range of products, made them an obvious solution in providing protection to buildings against the external elements, offering benefits over traditional materials in terms of water resistance, vapour permeability, flexibility, strength and durability.

The DuPont™ Tyvek® product range was enhanced with the introduction of our internal DuPont™AirGuard® membranes to control internal moisture and enhance energy efficiency. Together with a complete range of adhesive sealing tapes and accessories, the combined product portfolio has evolved to meet the demands of the changing world, providing solutions for the following:

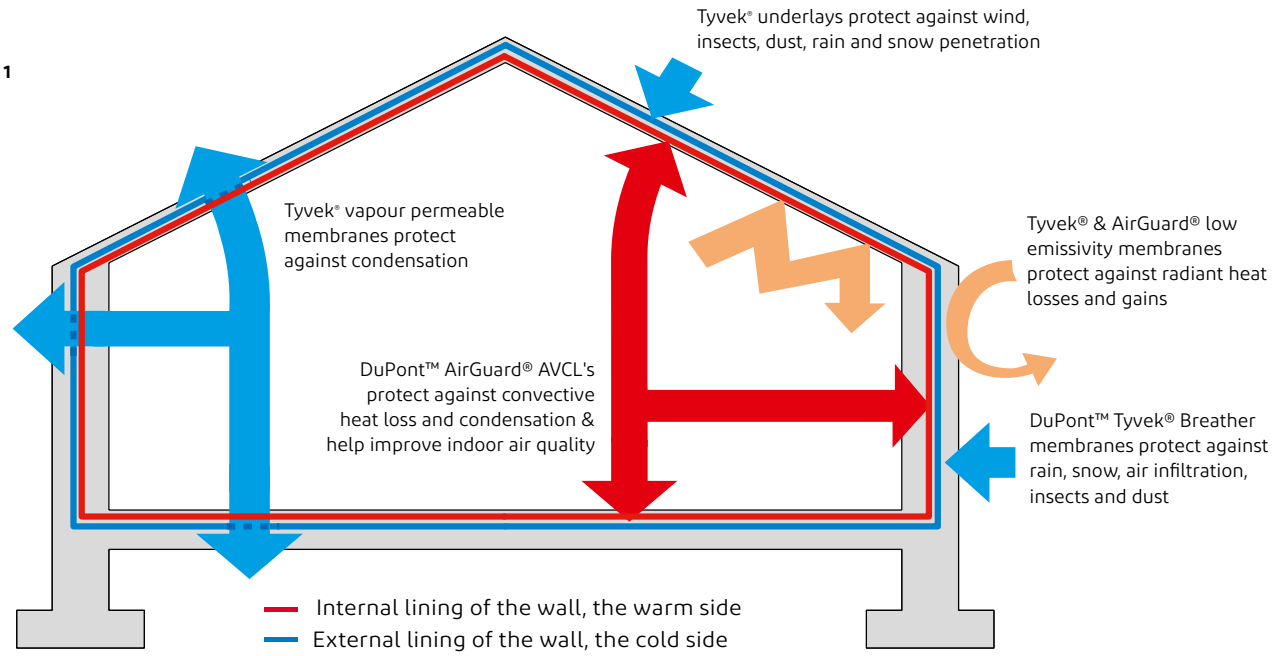
- Weather Protection
- Moisture & Condensation Control
- Energy Efficiency & Airtightness
- Indoor Air Quality
- Thermal Performance
- Fire Safety
- Long Term Durability

Protection in Construction

This technical manual contains detailed information specifically on the use of Tyvek® and AirGuard® membranes in wall and floor construction. By controlling the movements of heat, air and moisture through the building envelope DuPont™Tyvek® and DuPont™ AirGuard® membranes can make a major contribution to protecting the environment by improving the energy efficiency of buildings.

To achieve the required internal conditions with optimum efficiency it is essential to consider air flow and moisture movement together with all aspects of heat transfer, not only by conduction, but also by convection and radiation. The reduction of air leakage, the avoidance of damaging condensation and the provision of thermal insulation must all be considered together to ensure the protection and well-being of the occupants and the long-term protection of the building fabric.

Fig. 1



For information on Tyvek® & AirGuard® membranes for protection against external moisture please contact the DuPont™ Tyvek® Building Knowledge Centre. Details on back page.

Breather Membrane Suitability Check

The following functional characteristics should be considered to determine whether a breather membrane is suitable for use in your project:

Suitability Check

Temporary Weather Protection

The membrane should be capable of protecting the fabric of the building from rainwater penetration during construction, before the primary water-shedding layer (external cladding) is installed.

Secondary Weather Protection

Some rainscreen cladding systems do not form complete rain barriers and it is expected for moisture to penetrate towards the structure and insulation zone on occasions. The membrane should provide a second line of defence against water penetration during the life of the building.

Does the membrane (or sheathing) provide W1 water resistance to EN 13859-2?

Does the membrane (or sheathing) satisfy current regulations and standards for resistance to moisture?
eg. Approved Document C

Does the membrane (or sheathing) have a water vapour resistance lower than 0.6 MN.s/g (SD 0.12m) in accordance with BS5250?

Vapour Permeability

Moisture trapped within a wall element can have serious implications on thermal performance, health (respiratory) and structural integrity.

The membrane should be suitably vapour permeable (vapour-open), to allow water vapour to escape from the construction and limit the risk of condensation.

Does the membrane (or sheathing) have a water vapour resistance lower than 0.6 MN.s/g (SD 0.12m) in accordance with BS5250?

Long-term durability

Through the life of a building, materials and components used within the construction will degrade and their functional performance diminish. Inadequate resistance to ageing will compromise the element's ability to provide long-term weather protection.

The technical and physical characteristics of the breather membrane should last for as long as possible and it should therefore have good durability to heat and UV ageing.

Does the membrane have adequate aged values?

This information can also be verified by an independent UKAS certified body (eg. BBA)?

Resistance to Penetration of Air

The membrane can contribute to the overall energy efficiency of the building if it has a low permeability to the passage of air. A breather membrane with good airtightness will help reduce convective heat loss, cut down on carbon emissions, help improve indoor air quality in urban environments and provide greater control for internal ventilation regimes and heat recovery systems.

Does the membrane have measured air permeability values, verified by an independent UKAS certified body (eg. BBA)? The figures will be the same as for a pressure test (m3/hr./m2@50Pa)

DuPont™Tyvek® membranes are suitable materials for use as breather membranes in lightweight framed wall constructions, both on-site and off-site.

Off-site & Modular Construction
(Modern Methods of Construction MMC)

This modern method of construction is gaining ground rapidly in the industry, with more than half of the UK's new housing stock generated through this process. In addition to the reduced risk of moisture damage, off-site construction provides many benefits, including:

- Greater speed & efficient planning
- Better quality & control
- Sustainability - greater integration of low carbon energy solutions
- Less disruption to clients and the surrounding environment
- Helping to build to a budget
- Providing waterproofing protection from manufacturing, through transportation to erection on site
- Possibility to automate process

DuPont has been a leading manufacturer of a wide range of products supplied to the Off-site construction marketfor >25 years. Our technical Building Knowledge Centre team will be pleased to support you in this area to achieve the best building performance.
Our new technical off-site /Modern Methods of Construction (MMC) manual is now available on our website along with our latest Installation Guides and Sheets, Videos and other useful information.

Floor Constructions

Tyvek® membranes may also be installed into suspended floor constructions, providing a method of support to insulation as well as offering protection against external moisture, condensation and air infiltration.

Installation guidance for the use of Tyvek® membranes in floor constructions is given on pages 34-36..

Vapour Control

Wall constructions and suspended floors should be designed to limit the risk of harmful condensation occurring. This is especially important in respect of condensation that occurs unseen within the wall or floor element – also known as **Interstitial Condensation**. This can be achieved in 2 ways:

1. By ensuring that any moisture laden air within the wall or floor element can escape to external air. External layers positioned on the cold side of the insulation such as a breather membrane, should have a low vapour resistance (less than 0.6 MN.s/g or an SD of 0.12m).

2. By installing an internal membrane which helps to reduce vapour migration from the building interior through the wall or floor element. A membrane that is both vapour resistant and airtight will provide this function and is known as an **Air & Vapour Control Layer** (AVCL).

Airtightness

Air infiltration through gaps in the building fabric can accelerate the rate of heat loss due to convection and so reduce thermal performance. Both membranes mentioned above can help with airtightness, especially the internal AVCL with all joints sealed. Under the heading of 'air permeability' the various building regulations and standards that address energy efficiency require buildings to be efficient in terms of air-leakage. Achieving airtightness is equally important in both wall and floor construction.

Indoor Air Quality

In addition to energy efficiency, airtightness can be fundamental in improving Indoor Air Quality (IAQ). This is especially the case in heavily built up urban and city environments where the outside air may be polluted by road traffic or industry. In this case, it would be very important to achieve good levels of airtightness to help separate indoors from outdoors. Noise pollution would also be minimized with attention paid to the building fabric, insulation and effective sealing.

More information on airtightness and energy efficiency can be found in our Installation Guide for Energy Efficiency & Airtightness (see website for more details)

DuPont™ Tyvek® membranes wall applications

There are many different types of wall construction, most of which would benefit from the inclusion of a Tyvek® membrane. We have included some of the more common variations here as typical examples:

Fig. 1 Timber Frame
Traditional
(bricks or brick slips)

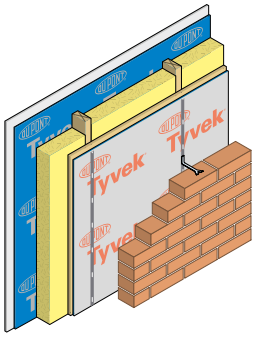


Fig. 2 Timber Frame
Reverse construction)
Horizontal Weatherboarding

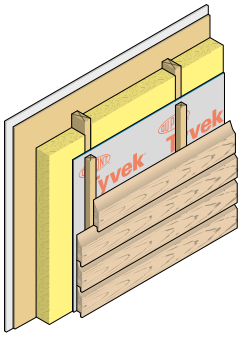


Fig. 3 Timber Frame
Vertical weatherboarding

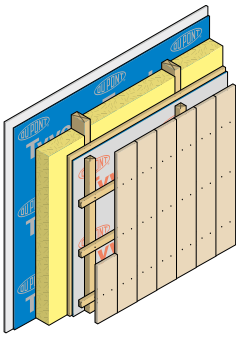


Fig. 4 Timber Frame
Vertical slate/tile hanging

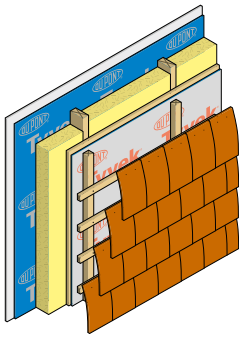


Fig. 5 Steel Frame
Metal clad

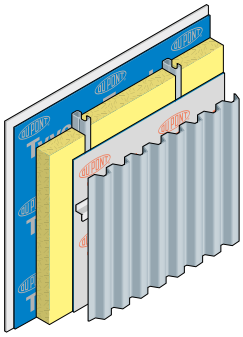


Fig. 6 Masonry Wall
Internal insulation upgrade

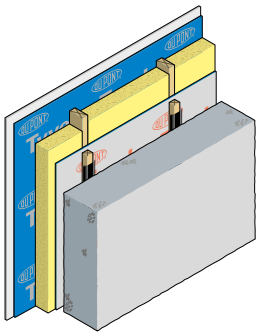


Fig. 7 Masonry Wall
Metal clad

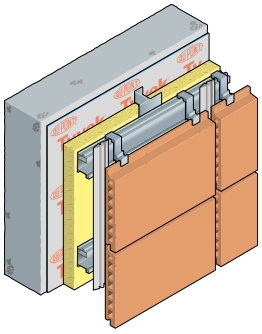


Fig. 8 Steel Frame
Rainscreen cladding

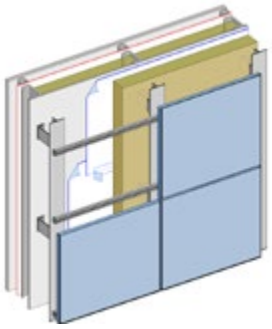
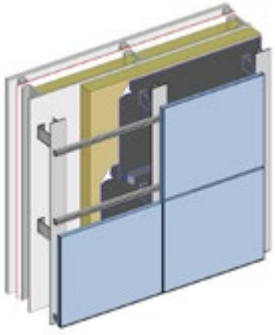


Fig. 9 Steel Frame
Rainscreen cladding - open joints



Vertical battens over the breather membrane have been included in some details to ensure positive drainage of moisture. Although they may not always be required they are recommended particularly in areas subject to extremes of weather.

DuPont™ Tyvek® membranes in walls

The previous pages in this technical manual confirm the suitability of Tyvek® membranes in wall and floor applications. References to current legislative documents as well as approvals from the BBA further reinforce the message that the materials are 'fit for purpose' as breather membranes in wall constructions. In order to attain maximum benefit from a Tyvek® membrane, both in terms of performance and warranty, it is important to ensure that correct installation procedures are followed.

The following pages contain information on how best to install Tyvek® membranes in wall constructions. Although there are many construction variations the basic principles for installation remain the same. Many of the details included here are regarded as standard practise in the timber frame industry, thus we have drawn upon the knowledge and experience of TRADA Technology in these instances.

Fire Performance

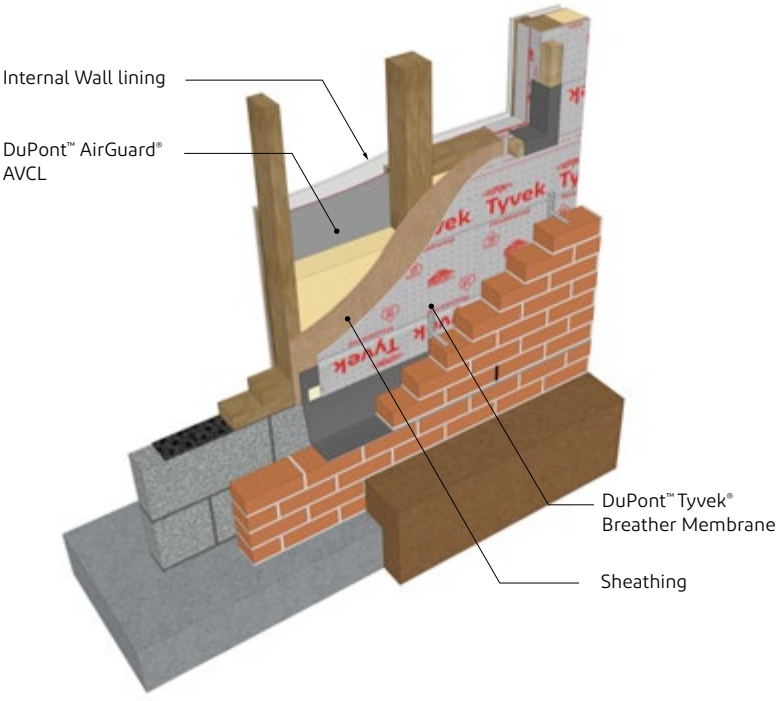
Attention must be paid to current fire regulations and standards, to ensure materials used in an external wall element meet the criteria for building height and proximity. Please also refer to page 46 for information on DuPont™ Tyvek® and DuPont™ AirGuard® fire performance products. For assistance on fire related projects please contact the DuPont™ Tyvek® Building Knowledge Centre (details at end of document)

Detailing - Framed Wall Construction

The external envelope of a timber frame wall system consists of two elements:

- The loadbearing timber frame wall
- The outer cladding. This may be a heavyweight cladding, supported independently by the foundations, or a lightweight cladding attached to the timber frame.

Fig. 12 - Typical timber frame wall brick cladding



Suitable AirGuard® AVCL's

DuPont™ AirGuard® Reflective
DuPont™ AirGuard® Control
DuPont™ Tyvek® AirGuard® Smart
DuPont™ AirGuard® A2 FR

Suitable Tyvek® Membranes

DuPont™ Tyvek® Housewrap
DuPont™ Tyvek® FireCurb®
DuPont™ Tyvek® Reflex
DuPont™ Tyvek® StructureGuard™
DuPont™ Tyvek® Supro

Typical timber frame construction employs timber studs and rails, together with a wood based sheathing, to form a structural frame which transmits all horizontal and vertical loads to the foundations. The exterior cladding is non-loadbearing, although it may contribute to wind resistance; it is used to weatherproof the building and to provide the desired external appearance.

Although vapour permeable and moisture resistant sheathing boards are sometimes used, the sheathing is generally plywood or oriented strand board (OSB). The breather membrane is fixed to the sheathing to form a complete secondary protection layer.

External cladding

The external finish can vary greatly from a continuous brick or blockwork leaf to a discontinuous layer of vertical tile hanging or open jointed cladding. The type of cladding can sometimes determine the suitability of the breather membrane to specify, as with Tyvek UV Facade (see pages 16/17)

Steel frame (SFS)

A steel frame system is constructed in a very similar way to its timber counterpart. The build-up may include a cement, gypsum or calcium silicate board instead of a ply or OSB sheathing, but the choice of Tyvek breather membrane would be the same.

*All Tyvek® wall membranes are suitable in this application unless fire regulations require specific fire performance at certain heights

Detailing - Framed Wall Construction

A Tyvek® breather membrane can be installed either on site or as part of a factory fabrication process. The latter, traditionally, would be where a panel, complete with timber framework, sheathing and breather membrane would be manufactured, transported to site and erected. Today, the process has evolved into a thriving modular industry, with complete units being produced, incorporating internal finishes, services and sometimes furniture, carpets and curtains. This process carries with it significant time and cost savings, as well as improvements in quality control. Please also see note on Offsite and Modular Construction on page 11.

Site installation

Fig. 13 - Overlap at sole plate/bottom rail

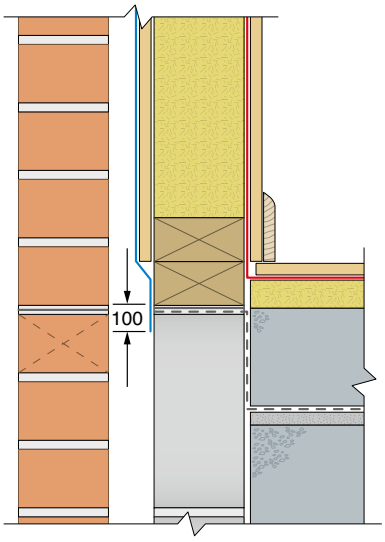
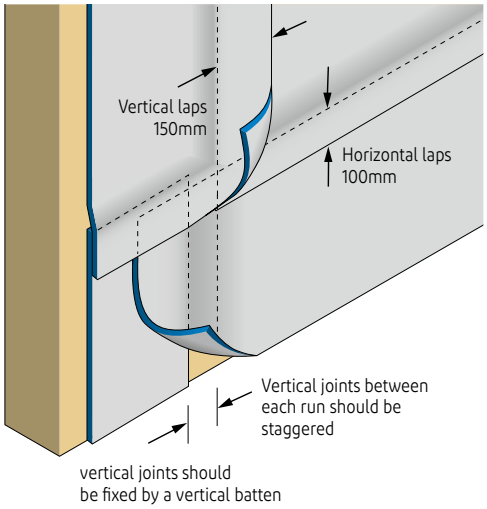


Fig. 14 - Horizontal and vertical laps



Application of the Tyvek® breather membrane follows the same process for each method and starts from the sole plate or bottom rail, working upwards.

Sole plate (Fig. 13)
The Tyvek® membrane should be fixed at least 100mm below the lowest timber member, usually the sole plate.

The standard method of application for a Tyvek® breather membrane is for it to be unrolled horizontally over the face of the sheathing/framing, but it may also be laid vertically if this is more appropriate.

Laps (Fig. 14)
The upper run of Tyvek® membrane must overlap the lower to prevent water which may run down the wall from running behind the membrane. All horizontal laps should be at least 100mm and vertical laps 150mm.

Fixings
Tyvek® membranes are normally fixed to the sheathing with stainless steel staples or corrosion resistant nails. Fixings should be as follows:

Horizontal fixing
generally 600mm or at stud positions,

Vertical fixing

at stud positions	300 mm
at sides of openings	150 mm
at vertical membrane joints	150 mm
at end of panels*	150 mm

* required when membrane is fixed to panels in the factory.

Detailing - Framed Wall Construction

The locations of the studs should be marked onto the Tyvek® breather membrane to determine wall tie or batten fixing points. This is commonly done by using an indelible marker pen. PVC banding tape may also be used and is particularly recommended where the site is located in an area of very severe exposure, as it strengthens the fixing.

Fig. 15 - Factory manufactured panel

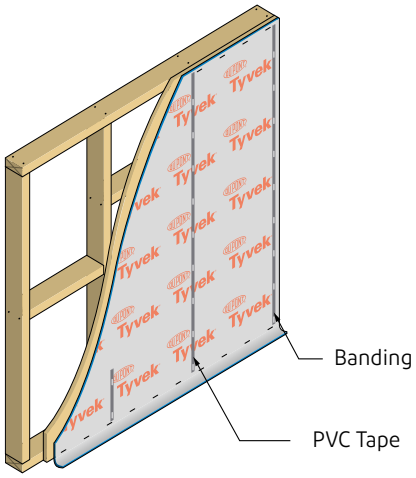


Fig. 16 - Cavity barrier at intermediate floor junction

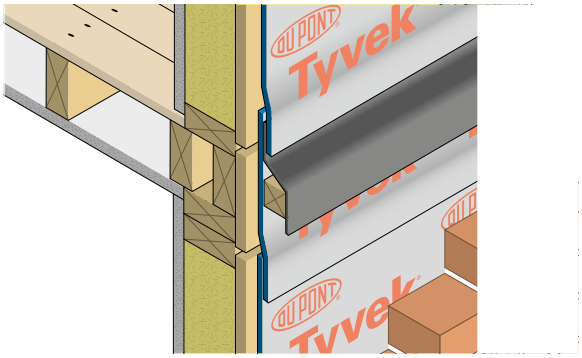
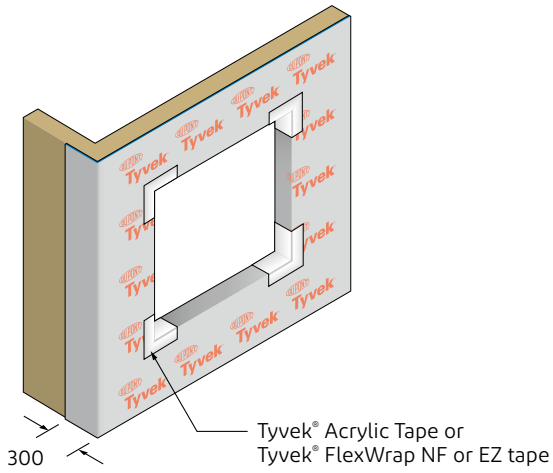


Fig. 17 - External corner and window opening



Pre-fabricated panels (Fig. 15)
Reinforcing tape is generally used where Tyvek® membranes are applied to panels in the factory. This provides additional tear resistance when transporting pre-made panels to site. Tyvek® membranes applied to panels in the factory should be fixed as listed in Table 1 and at the sides, head and base of each panel. The membrane should extend beyond the sides and base of panels to comply with the lap requirements shown in fig. 14.

Floor junctions (Fig. 16)
The membrane at the base of upper storey panels should be extended sufficiently to cover the intermediate floor zone and provide a 100mm lap over the lower panel. Lap sections on pre-fabricated panels should be temporarily fixed back for transport.

Cavity barriers (Fig. 16)
The Tyvek® membrane should lap over DPCs at horizontal cavity barriers, fire stops and cavity trays. Cutting the membrane and sliding a DPC behind will be sufficient. Alternatively a separate skirting strip may be used to ensure an adequate lap detail. Additional information on fire barriers can be found on page 24.

External corner (Fig. 17)
Returns around external corners should be at least 300mm.

Windows and doors (Fig. 17)
Extend the Tyvek® membrane over window and door openings. Cut an 'X' in the membrane and fold back. Make good to the corners with Tyvek® Acrylic Tape (single sided) or Tyvek® FlexWrap NF or FlexWrap EZ.

Fig. 18 - Window head (render & lathe)

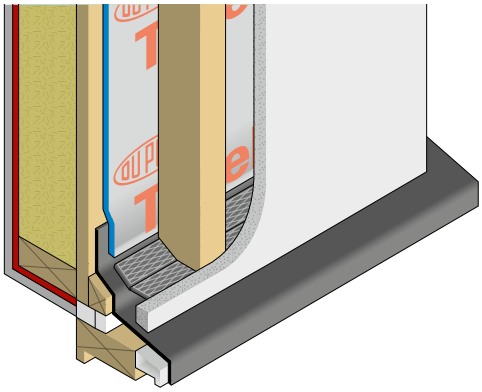


Fig. 19 - Base detail (render & lathe)

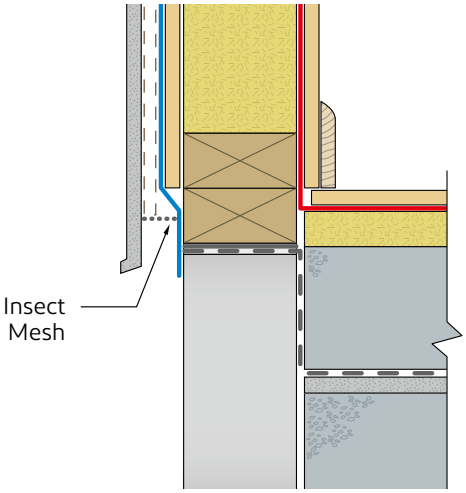
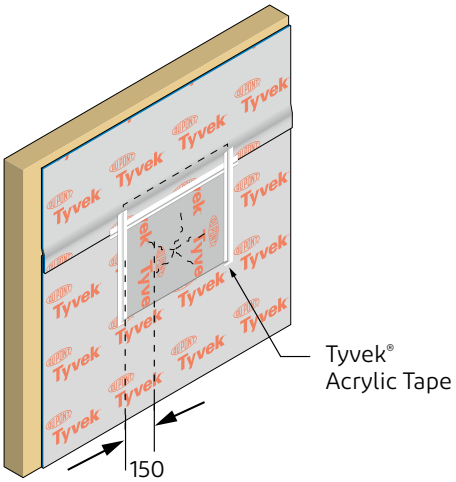


Fig. 20 - Damage repair



Window head
If an outer leaf of brick/block is being used dress the Tyvek® membrane over the cavity tray as in Fig. 16.

If external cladding such as tile hanging, weatherboarding, render and lathe is used, dress the Tyvek® membrane over a proprietary flashing (Fig. 18).

Base details for cladding
Generally, the Tyvek® membrane is finished at base level as in Fig. 13. But the batten space behind the cladding, should be closed off with an insect mesh/screen (Fig. 19).

Fixing to masonry
The Tyvek® membrane should be mechanically secured to masonry with a suitable anchor fixing system or a masonry nail/screw and EPDM rubber washer. Fixings should be at maximum 500mm centres.

Fixing to steelwork
Fix the Tyvek® membrane to steelwork with a suitable drill-tip or self-tapping screw and EPDM washer. Tyvek® Double Sided (acrylic) Tape may be used for temporary fixing.

Damage repair
Any damage that occurs in a Tyvek® membrane should be made good as soon as possible:

Minor damage may be repaired with Tyvek® Acrylic Tape (single sided).

More extensive damage should be covered with a Tyvek® patch (Fig. 20)

Large areas of damaged Tyvek® should be replaced completely.

Airtightness
Heat loss by convection will occur at all horizontal and vertical laps, door and window details. Air leakage can be reduced by sealing the membrane at these points with adhesive tape. This can be achieved by using Tyvek® Acrylic Tape (single sided), Tyvek® Double-sided Tape (acrylic) and/or Tyvek® FlexWrap NF. Any brackets or components that are retrospectively fixed over the membrane may be sealed with Tyvek® Butyl Tape (double-sided) if necessary.

All Tyvek® wall membranes are suitable in this application unless fire regulations require specific fire performance at certain heights

Suitable membranes:
Tyvek® Housewrap, Tyvek® StructureGuard™,
Tyvek® UV Facade and Tyvek® Reflex,
Tyvek® FireCurb® breather membrane
Tyvek® Trifecta™

Detailing - Framed Wall Construction

Vapour control - vapour diffusion

Timber and steel frame wall construction involves the installation of a sheathing board fixed to provide wind bracing, lateral strength, etc. This layer is fixed to the external face of the framework, which is regarded as standard practice (see Fig. 12). Sheathing boards of plywood, oriented strand board or cement particle board (steel frame) are commonly used, but contain adhesives and are relatively vapour resistant. Performance requirements regarding thermal and condensation control are generally met, but are in part dependant on the existence of other essential components such as an internal vapour control layer (AVCL). Workmanship in installing an AVCL is important as the integrity of this layer will determine its effectiveness in preventing/reducing water vapour transfer via convection into the construction. This is water vapour that can condense on any cold impermeable surface within the construction.

The "5 times rule"

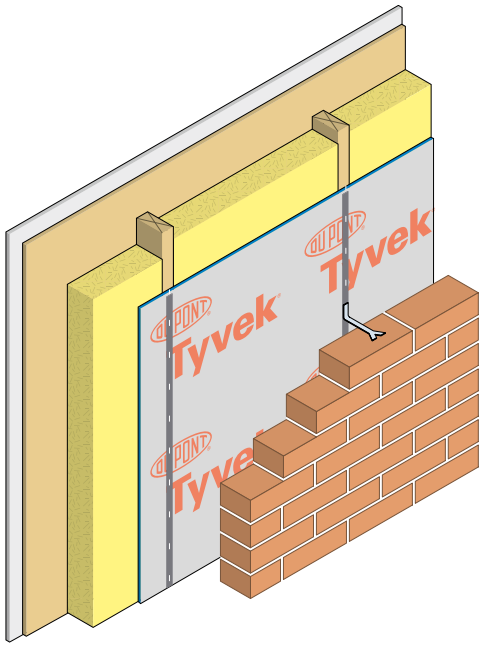
Effective vapour diffusion, or vapour release, on the cold (external) side of the construction is equally as important as vapour control on the warm (internal) side. Materials on the warm side of the construction should have a greater vapour resistance than those on the cold side. As a guide, a ratio of at least 5:1 is recommended, also known as the "5 times rule" for vapour resistance. Installing a vapour resistant membrane internally to stop the vapour and a breathable membrane fixed externally to let vapour out will ensure that moisture is not trapped within the construction. This forms the basis of a "breathing wall" construction.

Reverse wall construction (Fig. 21)

An alternative process of constructing timber and steel frame walls is to install the sheathing board on the internal side of the framework. The Tyvek® breather membrane can then be fixed directly to the external face of the framework, providing protection to the construction as well as retaining the insulation. This would affect the fixing sequence, but the benefit here is that when a sheathing board is installed internally it can provide additional vapour control for the system as the materials are generally vapour resistant. In this case particular attention will need to be paid at all board joints and penetrations to prevent excessive water vapour transfer into the construction. Sealing these weak points will assist in achieving a convection tight system. However, the use of a dedicated vapour control layer/air leakage barrier such as AirGuard® Reflective is still recommended between the sheathing board and insulation.

A reverse wall construction would not be so beneficial in a timber/steel frame system that has additional insulation installed on the cavity side of the sheathing.

Fig. 21 - Reverse wall construction



When timber and steel frame walls are internally sheathed, the sheathing board may provide the racking strength, contribute to fire resistance, comply with surface spread of flame (reaction to fire) classification and provide the internal decorative surface. Such boards may include cement-bonded particleboard, fibre reinforced gypsum board, mineral fibre boards, and fire retardant treated plywood, OSB and chipboard.

The use of timber based boards as internal linings may be limited by surface spread of flame (reaction to fire) requirements. Their fire resistance can be improved with the application of treatments/coatings, but demonstration of compliance with the relevant fire regulations may still be required.

Fire Regulations should be checked for material suitability

Suitable membranes:
Tyvek® Housewrap, Tyvek® StructureGuard™,
Tyvek® UV Facade, Tyvek® Reflex and
Tyvek® FireCurb® breather membrane

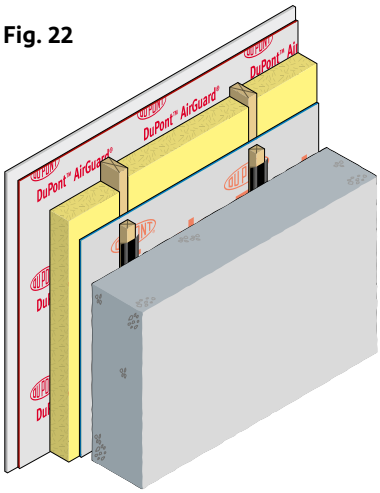
Note: Specifying a reverse wall construction may affect details at junctions, floors, roof, etc. and designers should take this into account when considering this method of construction.

Detailing - Masonry Wall Construction

Internal insulation upgrade (Fig. 22)

Existing solid masonry/stone walls invariably suffer from internal mould problems arising from condensation due to their poor thermal performance. Upgrading these constructions commonly involve the installation of an internal insulated panel. This has the benefit of providing a clean, dry internal lining as well as improving overall thermal performance. Condensation and mould growth will not then be apparent, but potentially can still occur on the masonry/stone surface, which is now hidden from sight within the construction. In normal circumstances the cavity between a timber frame wall and brick and block cladding should be 'self draining' and 'vented' to prevent the build-up of moisture. The installation of airbricks, cavity tray and weep holes would ensure this. However, as this may not be possible with an internal insulation upgrade, emphasis should be placed on the vapour controlling abilities of the internal lining to prevent vapour from diffusing into the construction in the first instance.

Fig. 22



Battens should be fixed to the inside face of the existing wall via strips of DPC for protection against moisture. A new Tyvek® covered insulated panel can then be constructed away from the existing wall.

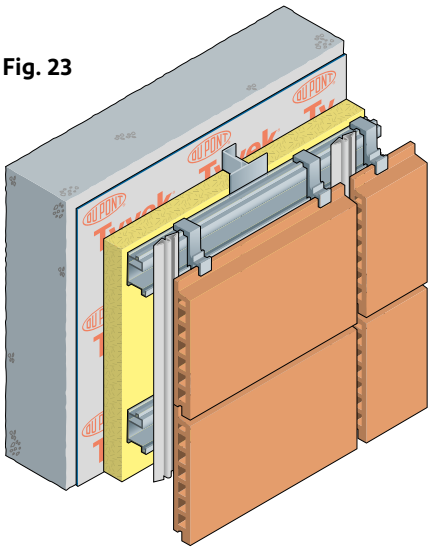
An internal air & vapour control layer (AVCL), such as DuPont™ AirGuard® Reflective should be installed with meticulous attention paid to all laps, edge details and penetrations. Sealing the AVCL in this system is key to the prevention of condensation on the inside face of the existing wall.

For best practice, the internal lining (plasterboard) should be spaced off the AVCL with battens, helping to minimise penetrations through the membrane. This newly formed 'services void' will also allow DuPont™ AirGuard® Reflective to boost the overall thermal value of the wall system. For further information on AVCL detailing please see pages 38 - 41.

Rainscreen cladding (Fig. 23)

Rainscreen cladding systems differ from other wall constructions, as although the membrane is still fixed directly to the structure, it is situated behind the insulation, This is due to the nature of the cladding system which employs a supporting rail that penetrates the insulation, making the application of an external membrane very problematic. Many rainscreen systems offer high levels of protection from precipitation and several insulation types are moisture resistant. In these instances a Tyvek® membrane may not be required, but joints should be considered.

Fig. 23



Where there is a risk of moisture penetration through the insulation and internal layers, a protection membrane behind the insulation is advised. The material to specify is dependant on the risk of condensation at this interface, determined in the main by the temperature. If in doubt a breather membrane should be used. In any case the material should be water resistant.

Fixing: For guidance on fixing Tyvek® to masonry and steelwork please refer to the notes on page 17

Suitable membranes:
Tyvek® Housewrap, Tyvek® StructureGuard™,
and Tyvek® FireCurb® breather membrane
Tyvek® Trifecta™

High Rise, Multi occupancy Commercial, Residential, Health, Education...

- Ventilated Facade Systems
  - Breather Membrane placement
  - Penetrations & Brackets
  - Fire Stops & Barriers
  - Window Details
  - Separating (Party) Walls
- Sheathing board systems (why a membrane is essential)
- Breather Membrane section
- Air & Vapour Control Layer with variable resistance
- Heat Loss in Buildings
- Fire and Smoke System
- Window and door details

Useful step by step installation guides and videos are available from the DuPont™ Tyvek® Building Knowledge Centre and our web sites:

www.building.dupont.co.uk

www.energy-efficiency.dupont.com

Important:- All building regulations should be checked to ensure compliance, especially with respect to fire performance

Ventilated Façade Systems

Masonry and Steel Frame Construction

The evolution that has occurred over the last 30 years with external wall systems has been significant. They have become more technical in terms of thermal performance, moisture management, airtightness and fire protection.

Traditionally, masonry and steel construction was limited to agricultural buildings and warehouses. However, they are now commonly employed in a wide range of developments, including offices, factories, schools, public buildings and some residential dwellings.

In medium to high-rise developments, masonry or steel structural elements are often preferred, and these commonly include infill wall panels composed of lightweight galvanized steel framing.

The strength and durability of these components makes them resistant against extreme wind conditions and moisture. Thermal insulation, sheathings and internal linings however, must still be protected and therefore the functions provided by DuPont™ Tyvek® and AirGuard® membranes continue to be essential.

SFS - Rainscreen Wall System

Membrane A

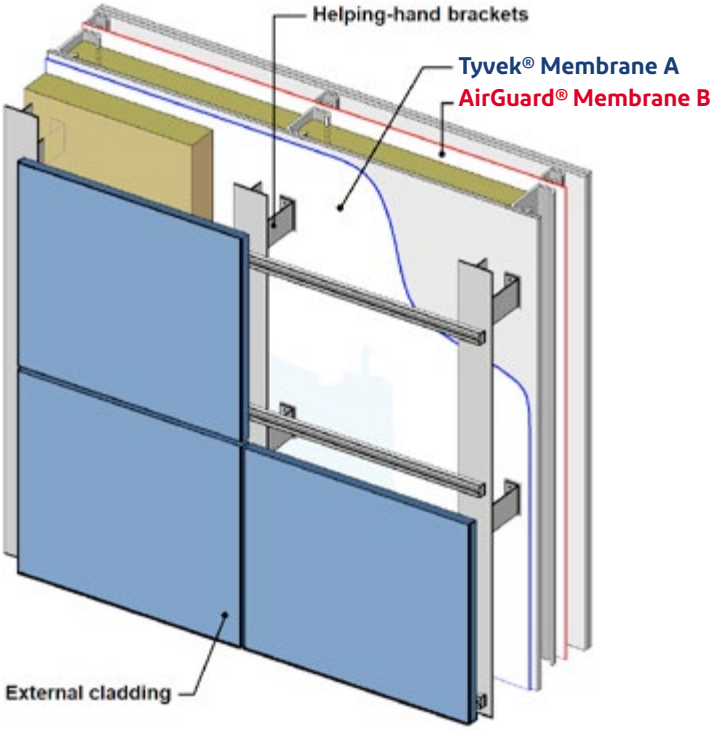
The illustration opposite shows a typical Rainscreen System with a Tyvek® breather membrane **(Tyvek® Housewrap, Tyvek® StructureGuard™, Tyvek® Trifecta™ or Tyvek® FireCurb®)** fixed directly over the sheathing. The insulation fitted between cladding brackets would need to be suitably moisture resistant.

The membrane on the sheathing could be an AVCL if no insulation is to be installed between the SFS (or very little).

If some insulation is installed between the SFS, the external membrane will need to be a breather membrane, to avoid condensation occurring.

Membrane B

The AVCL is normally installed behind the dry-lining spaced off by a services void (battens or channels). Recommended AVCL for SFS systems is AirGuard® Reflective or AirGuard® A2 FR.

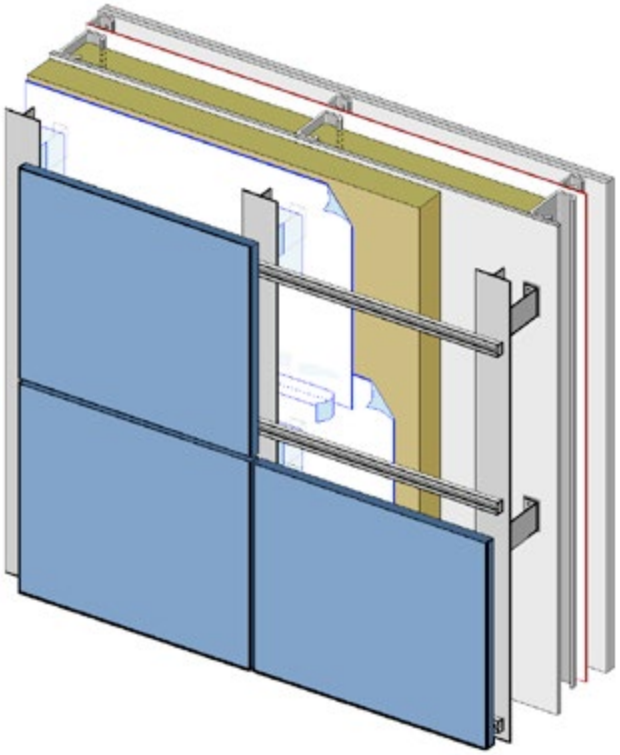


Detailing wall systems - Tyvek® & AirGuard® membranes

Membrane on the insulation

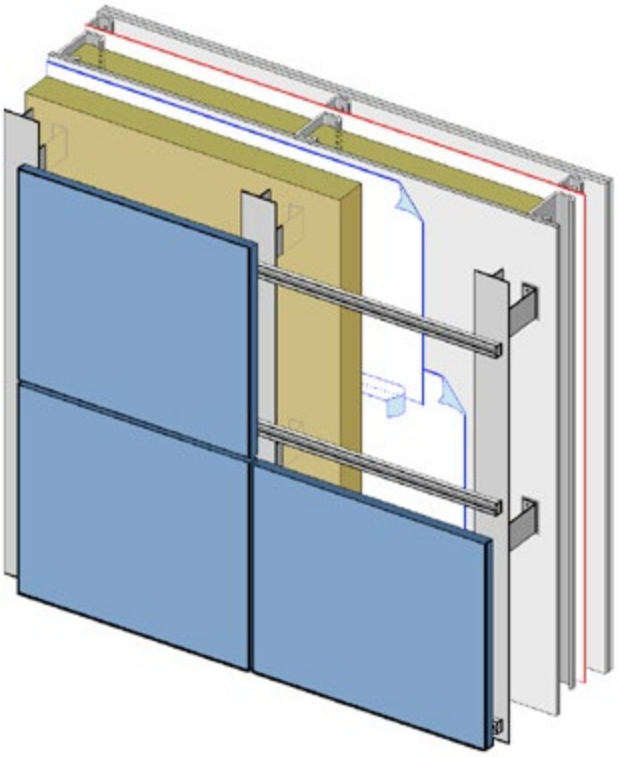
The traditional position for a Breather Membrane in an external wall system is on the outside (cold) face of the insulation. The water resistance of Tyvek® membranes far exceeds the EN13859-2 W1 class (see page tbc) so they provide exceptional weather protection to the wall, both during construction and in the long term.

Applying the membrane to the outside face of the insulation can be difficult, as it will have to be cut and formed around the many brackets that are fixed back to the sheathing and extend through to support the external cladding. These penetrations will have to be made weathertight by sealing with the appropriate single-sided tape (see illustration opposite).



Membrane behind the insulation

Rainscreen systems often incorporate an insulation product that is resilient to moisture, allowing the membrane to be installed behind it, directly onto the sheathing board. A noteworthy benefit here is that the membrane can be installed easily and very quickly, allowing the wall system to be protected from the weather at the earliest possible opportunity. This method avoids the time-consuming process of cutting and taping around the brackets (described above). Designers and installers should check that this arrangement is accepted by all parties involved.



Moisture Resistant Sheathing

Using a Tyvek® breather membrane in a rainscreen system will ensure continuous weather protection is provided to the sheathing, insulation, structure and the building interior. Some sheathing products are purported to have a weather resistance function, to the extent that a VPM is not needed.

Specifiers are advised to check that such claims are supported with third party documentation which demonstrate suitability. Emphasis should be on compliance with the relevant technical standards and regulations that specifically address **RESISTANCE TO EXTERNAL MOISTURE.** Where such products do not state compliance, or where doubt exists, a Tyvek® breather membrane should be used. In any case the joints of sheathing products must be protected against water ingress.

Ventilated Façade Systems

Penetrations & Brackets

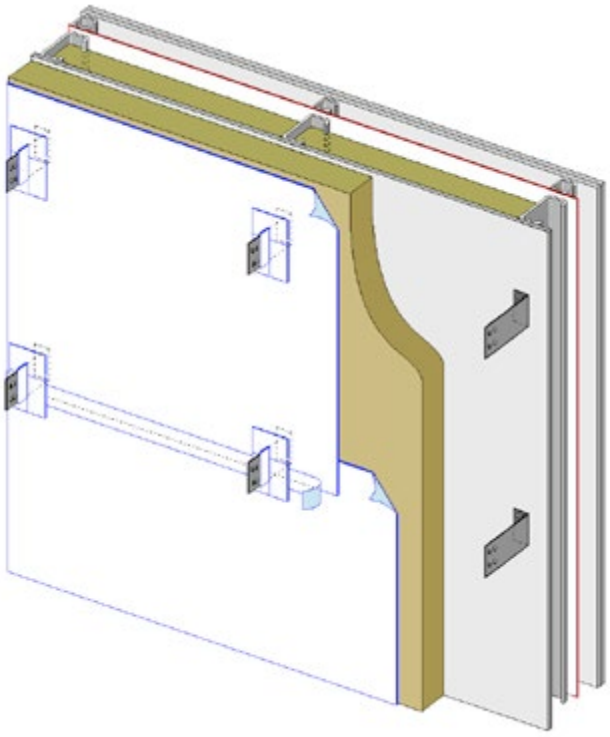
When the Tyvek® breather membrane is fixed onto the external face of the insulation, the main emphasis should be on its ability to keep external moisture out of the construction.

Lapping the membrane in accordance with the prescribed recommendations (100mm horizontal, 150mm vertical) will generally suffice, but penetrations through the membrane will compromise its integrity and must be sealed with the appropriate tape.

External Airtight Line

For some projects, it may be preferred for the Tyvek® breather membrane to provide external airtightness to the wall element. To make this a viable solution, meticulous attention will need to be paid to the membrane's continuity by sealing all laps and penetrations.

As shortfalls in airtightness very often occur during installation designers and installers should aim for the best results possible, to allow for some margin of error. On-site assistance with membrane installation and detailing is available on request from DuPont Tyvek®.



• Above: Laps in Tyvek® StructureGuard and Tyvek® FireCurb® breather membranes are sealed with Tyvek® Acrylic Tape.

• Helping-hand bracket penetrations can be sealed with Tyvek® Acrylic Tape or Tyvek® FlexWrap EZ.

• Tyvek® Butyl Tape is suitable for use behind brackets, where required

If an external airtightness line is required, plastic insulation anchors should be covered over with single-sided tape

Tyvek® UV Façade Tape is a dedicated sealing tape suitable for sealing laps and bracket penetrations through Tyvek® UV Façade membrane

Detailing wall systems - Tyvek® & AirGuard® membranes

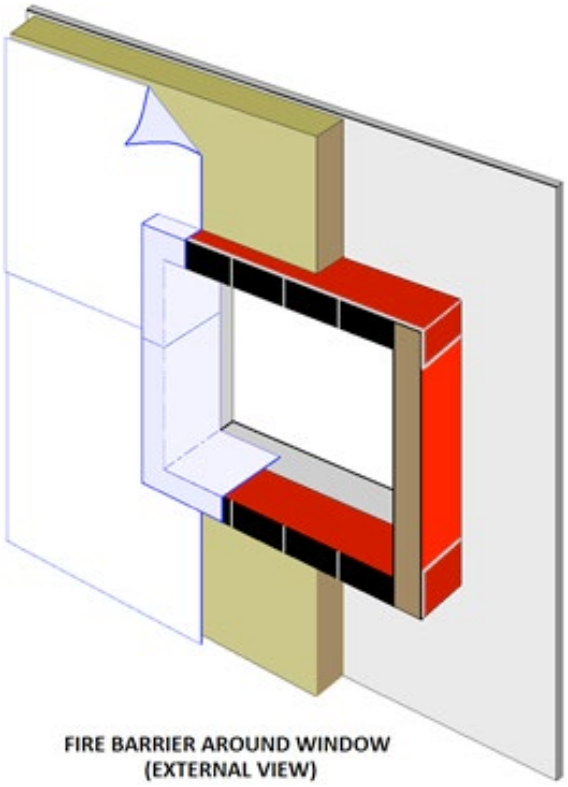
Fire Stops & Barriers

Ventilated Rainscreen Systems commonly incorporate airspaces that run continuously behind the external cladding. Fire spread through these airspaces , termed the 'Chimney Effect' must be prevented by way of compartmentation in accordance with relevant national regulations.

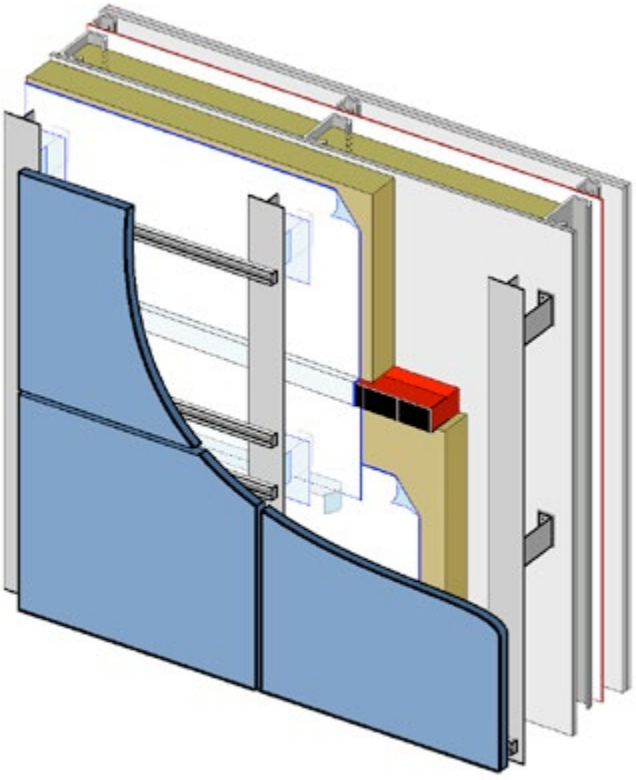
Regional Fire Regulations

- **England and Wales: Approved Document B**
- **Scotland: Technical Handbook, Section 2**
- **Northern Ireland: Technical Booklet E**
- **Ireland: Technical Guidance Document B – Fire Safety**

Horizontal and vertical fire barriers should be installed in accordance with regulations and manufacturers advice and subsequent insulation layers fitted tight against them. Where a Tyvek® breather membrane is installed on the external face of the insulation, it must be dressed continuously over the fire barrier to maintain the system's weathertightness. This will not impair the performance of the fire barrier product, including those that incorporate an intumescent element. The membrane will need to be cut and formed around the fire barrier and made good with the appropriate single-sided Tyvek® tape product (see footnote).



FIRE BARRIER AROUND WINDOW (EXTERNAL VIEW)



Tyvek® Tape	Suitable use
Tyvek® Acrylic Tape	Tyvek®StructureGuard™ laps Tyvek® FireCurb® laps Making good & penetrations
Tyvek® UV Facade Tape	Tyvek® UV Façade laps Making good & penetrations
Tyvek® Butyl Tape	Sealing behind brackets
AirGuard® A2 FR System Tape	Tyvek® Trifecta™ laps

The Tyvek® membrane should be dressed over fire barriers that are fitted around windows. This will maintain the integrity of the window opening for air sealing and weather tightness. The normal recommendations for lapping and tape sealing apply.

Ventilated Façade Systems

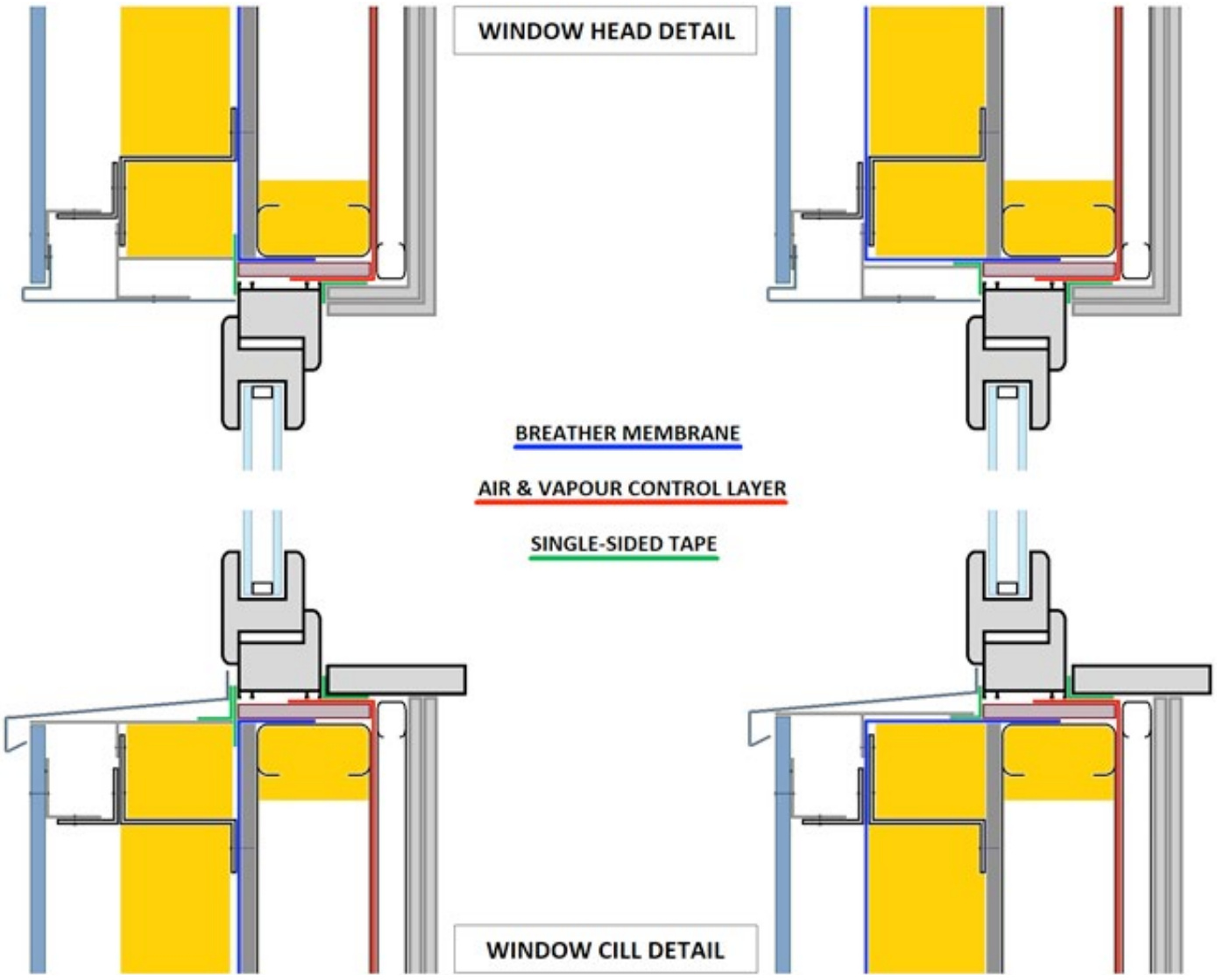
Window Head & Cill Details

The windows (& doors) of a rainscreen wall system should be designed and installed so that water is directed around the detail and to the outside of the building, rather than into wall cavities. The head of the window should include a flashing detail that diverts water that is draining down the cavity to the outside. The cill detail at the base of the window should be designed with similar drainage objectives. Regardless of whether the external membrane is installed in front or behind the insulation, it is still acting as a **secondary water-shedding layer** and must be detailed to effectively drain moisture to the outside in a similar way to flashings. Adhesive tapes (or sealants) should be used to seal the window frame and membrane interface (see illustration below).

It is often the case that the internal AVCL and external Breather membrane can be lapped and sealed within the window head/cill/reveal (according to the sequence of work and whether or not the window is fitted much later). To maintain air and vapour sealing, the window to membrane interface must also be sealed to prevent condensation occurring behind the frame. Suitable components within the window detail, such as plywood linings may be used to form part of the airtightness line. Again, adhesive tapes (or sealants) should be used to seal the window frame and membrane interface (see illustration below).

Tyvek® Breather Membrane Behind Insulation

Tyvek® Breather Membrane on Insulation



Recommended link to CWCT website: https://www.cwct.co.uk/pages/specification

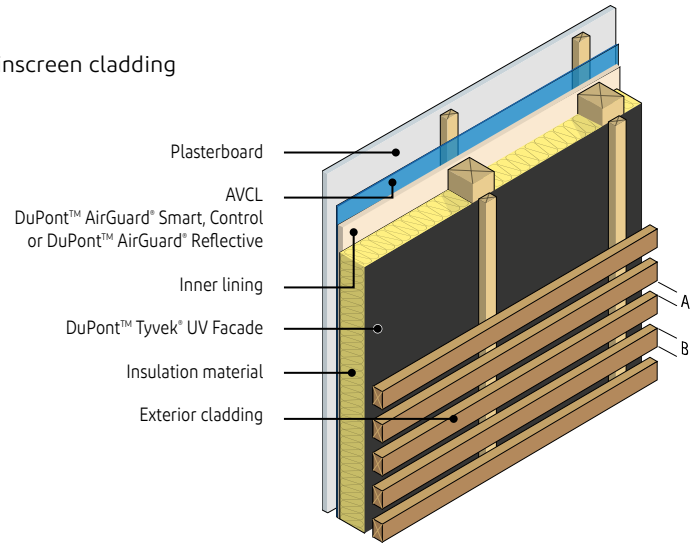
DuPont™ Tyvek® UV Facade installation

Permanent protection for open and ventilated rainscreen cladding

Long-term performance
Facades with open rainscreen cladding offer new design options, but the insulation and structure still require effective, permanent protection from the harmful effects of the elements to which it is constantly exposed. In particular UV radiation can compromise the long-term performance of secondary protection membranes. That's why DuPont have developed Tyvek® UV Facade, an advanced protective membrane specifically designed to meet the needs of open cladding constructions.

Open Rainscreen Cladding (Fig. 23)
Tyvek® UV Facade ensures optimum protection of the insulation and structure in open or ventilated cladding constructions from sunlight, wind and moisture. Unique in its class, Tyvek® UV Facade is the only known protective membrane for open-jointed cladding systems to carry the CE marking, certifying full conformity with the European Union's rigorous construction products directive. To obtain the CE marking for open cladding use, the membrane has to resist an artificial ageing by UV of 5000 hrs (for a standard wall/ roof application it is 336 hrs), followed by a 90 days exposure to 70°C.

Fig. 24 Open rainscreen cladding



* A < 3 cm,
* B ≥ 2A

Unique Properties:

- Proven long-term UV resistance (only known membrane with publicly available CE marking for open cladding use)
- 10-years warranty for joint width of up to 3 cm
- Lifespan of over 50 years for joint width of up to 2 cm
- For open joints of up to 3 cm
- Wind-tight, water-tight (w1) but vapour-open
- Suitable for open or ventilated cladding in timber, metal, stone and other materials
- Extremely lightweight, flexible and easy to install
- Can be left uncovered for up to 4 months while retaining full performance

However we recommend to cover Tyvek® UV Facade just after its installation.

To seal overlaps we recommend the use of the two adhesive tapes below which are compatible with Tyvek® UV Facade:

- Tyvek® UV Facade Tape which has a high UV resistance, excellent ageing properties and long term outdoor performance.
- Tyvek® Double-sided Tape which has a strong initial tack and excellent adhesion properties under extreme humidity conditions and varying temperatures.

Tyvek® UV Facade Plus
The Tyvek® wall membrane range is enhanced with Tyvek® UV Facade Plus which incorporates an acrylic self adhesive strip in the lap. This allows the membrane to be easily and effectively sealed for improved weather protection or for the prevention of air leakage. For air-sealing purposes Tyvek® UV Facade should also be used to make good to cuts and penetrations made in the membrane.

Tyvek® UV Facade Installation Sheet

DuPont™ Tyvek® Reflex low emissivity breather membrane

Tyvek® Reflex is a low emissivity breather membrane suitable for use in any wall system that requires secondary protection from external moisture. It is the result of many years of research and development by DuPont to create a strong, water resistant and breathable membrane that assists in the reduction of heat transmission through the building envelope. It is particularly advantageous in lightweight wall construction such as timber or metal frame systems.

Composition

Tyvek® Reflex is manufactured by bonding aluminium particles to the external face of a 'soft structure' grade Tyvek® membrane. It is this metallised coating that presents the low emissivity surface, reducing the amount of heat being emitted from the construction. The overall thermal transmittance or U-value of the construction will be reduced because Tyvek® Reflex will reduce radiated heat losses.

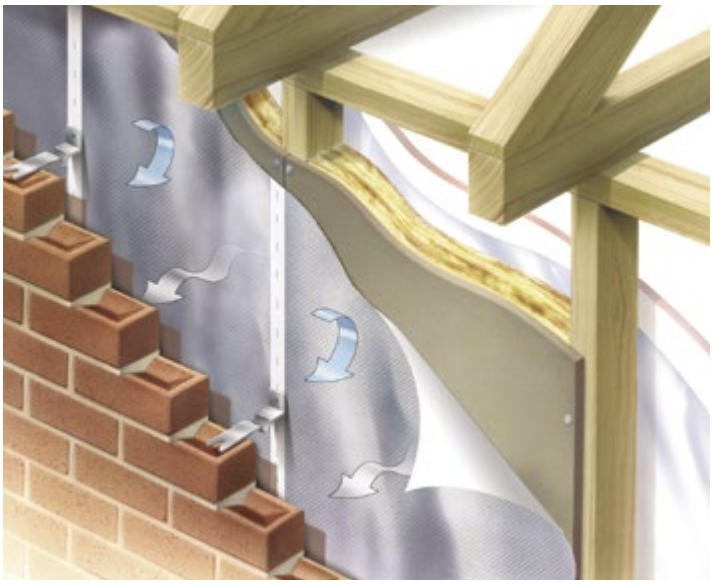


Fig. 26

Tyvek® Reflex can be categorised as a "Radiant Barrier".

A unique, specially formulated lacquer has been applied to the external metallised face of Tyvek® Reflex to provide maximum protection against oxidation and abrasion. The lacquer presents minimum resistance to the passage of water vapour, with no risk of cracking. Tyvek® Reflex is therefore suitably durable and flexible for factory or site installation.

Tyvek® Reflex has Class W1 watertightness to EN 13859-2 and is BBA certified as fit for purpose for use as a breather membrane.

Thermal value

Structural timber or metal stud dimensions are critical factors especially in prefabricated units and increasing stud depths is not always practical. Despite this, stud sizes may need to be increased to accommodate more insulation in order to comply with the thermal regulations. Tyvek® Reflex can help to alleviate this due to the additional thermal resistance that it provides.

The thermal benefit provided by Tyvek® Reflex compared to a standard breather membrane is demonstrated on the previous page with the U-values tables (DuPont™ AirGuard® Reflective & AirGuard® A2 FR are also included).

Condensation Risk

Increasing the thermal resistance of the adjacent airspace will also have the added benefit of reducing the risk of interstitial condensation. More heat will be retained within the sheathing as there is less heat being emitted by the membrane across the cavity. To reinforce this point the BBA have confirmed that Tyvek® Reflex '...will maintain the frame sheathing at a higher temperature than for the same construction incorporating a conventional breather membrane. This will in turn assist in limiting the risk of interstitial condensation ...'

Solar heat gain

Tyvek® Reflex will also help to reduce summer heat gain by reflection. Heat that builds up in the cavity behind brick/blockwork or an airspace behind cladding would normally be absorbed by the insulation/structure. The heat would then be transferred into the building by conduction and radiation. The metallised surface of Tyvek® Reflex will help to reduce this by reflecting the heat away from the structure beforehand. This would be particularly advantageous in constructions that contain minimal thermal insulation, eg. portable, lightweight or temporary buildings. A reduction in solar heat gain would also lessen the requirement for internal cooling provisions such as air-conditioning.

Thermal Resistance

DuPont™ Tyvek® and AirGuard® solutions for SFS external wall construction

Tyvek® Reflex (and airspace) = 0.57 m2K/W
DuPont AirGuard Reflective (and airspace) = 0.67 m2K/W.
Please see pages 38 to 41 for more information.

Less insulation needed for the same effects > increased insulation value without increased wall thickness

U-Values of insulated 90mm SFS external wall construction:

External cladding and support system, breather membrane, 50mm continuous insulation, sheathing board, 90mm insulation between SFS, DuPont™ AirGuard® AVCL, 25mm service void, internal plasterboard lining.

Insulation Thermal Performance Lambda Value		Standard Membrane	Tyvek® Reflex	Tyvek® Reflex + AirGuard® Reflective	Tyvek® Reflex + AirGuard® A2 FR
Mineral wool	0.038	0.34	0.28	0.26	0.26
	0.036	0.33	0.27	0.26	0.26
	0.034	0.32	0.26	0.25	0.25
	0.032	0.30	0.25	0.24	0.24
PIR	0.022	0.23	0.20	0.19	0.19
Phenolic	0.018	0.20	0.17	0.17	0.17

U-Values of insulated 120mm SFS external wall construction:

External cladding and support system, breather membrane, 50mm continuous insulation, sheathing board, 120mm insulation between SFS, DuPont™ AirGuard® AVCL, 25mm service void, internal plasterboard lining.

Insulation Thermal Performance Lambda Value		Standard Membrane	Tyvek® Reflex	Tyvek® Reflex + AirGuard® Reflective	Tyvek® Reflex + AirGuard® A2 FR
Mineral wool	0.038	0.31	0.26	0.24	0.24
	0.036	0.30	0.25	0.24	0.24
	0.034	0.29	0.24	0.23	0.23
	0.032	0.28	0.23	0.22	0.22
PIR	0.022	0.21	0.18	0.18	0.18
Phenolic	0.018	0.18	0.16	0.16	0.16

good average poor

The figures in the above tables show the improvement in terms of thermal performance when standard membranes are replaced by a range of Tyvek® and AirGuard® membranes, including the new DuPont™ AirGuard® A2 FR fire retardant AVCL

Tyvek® Reflex Installation Sheet

DuPont™ Tyvek® membranes Installation in suspended timber floors

Moisture Management

When a structural timber floor system is installed, the joists should be strength graded and have an average wood moisture content of not more than 20%. Any higher and the risk of mould formation is increased leading to eventual decay and structural failure. In order to retain the integrity of timber floor components, current guidance recommends that cross ventilation is provided to the airspace beneath. This is common practise and is recommended to ensure that any water vapour in the air beneath the floor will not condense and damage the structure. Moisture that is present in adjacent concrete, brick and block components will also be allowed to dry out sufficiently.

Air-leakage

Ventilating beneath a suspended timber floor system is an effective means of removing moisture laden air, but can be thermally detrimental. Insulated timber floor systems commonly include discontinuous insulation between the joists. The gaps and joints at the edges of the insulation will allow cold external air to filtrate into the construction, accelerating the rate of heat loss and so reducing thermal performance. Cold air infiltration may also create cold surfaces within the construction, potentially increasing the risk of condensation. It is therefore important to achieve airtightness in suspended timber floor systems.

Airtightness

Tyvek® membranes have good airtight characteristics and will therefore greatly reduce the passage of convective air currents. Installing a Tyvek® membrane beneath floor insulation will assist in improving the overall airtightness of the floor construction and reduce heat loss.

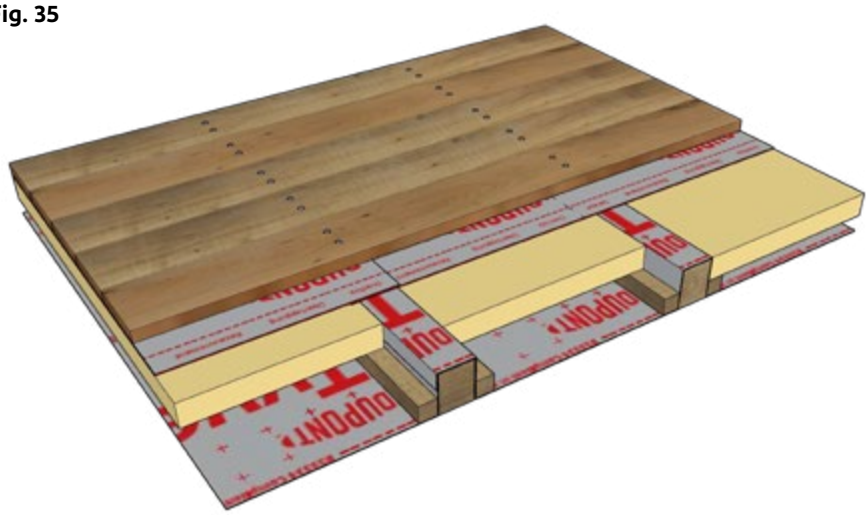
Similar to the installation of a DuPont™ AirGuard® AVCL (see internal lining), workmanship in installing a Tyvek® membrane for airtightness is paramount. The extent of penetrations made by fixing the membrane should be controlled to a reasonable minimum. Sealing the membrane around fixing points may not be necessary if flat headed nails are used, but laps and edge details should be sealed.

Note: Airtightness can only be achieved if the membrane is laid continuously with sealed laps.

Airtightness and the control of interstitial condensation can also be achieved by installing a DuPont™ AirGuard® AVCL. For suspended floor systems DuPont™ AirGuard® Reflective is generally recommended (see pages 32-35 and 56 for information). However, for projects that have experienced low level damp issues, DuPont™ AirGuard® Smart may also be used. The DuPont™ AirGuard® AVCL may be laid continuously over the floor joists, directly beneath T&G timber or OSB floor boarding. To minimize the air-leakage effect of fixing penetrations, Tyvek® Butyl Tape may be applied over each joist beforehand. Laps should be sealed using Tyvek® Metallised Tape (Reflective) or Tyvek® Acrylic Tape (Smart).

Building physics dictates that as heat displaces air upwards, most of the moisture contained within the air will escape at high level. However, as internal vapour pressure will push moisture and heat outwards in all directions, an efficient floor system should also be considered. Using an AirGuard® AVCL on the warm internal side of the insulation, in conjunction with an external Tyvek® membrane will provide the ideal system arrangement for moisture control.

Fig. 35



Material selection

Tyvek® Supro is a reinforced grade material which will provide adequate support to the insulation and is recommended for use in timber suspended floor systems. Please refer to pages 2 & 34 for product information.

Membrane over the joists and insulation is a DuPont™ AirGuard® AVCL for greatly improved airtightness and vapour control.

Suspended timber floors

Fig. 36 - Wall junction - joists running parallel

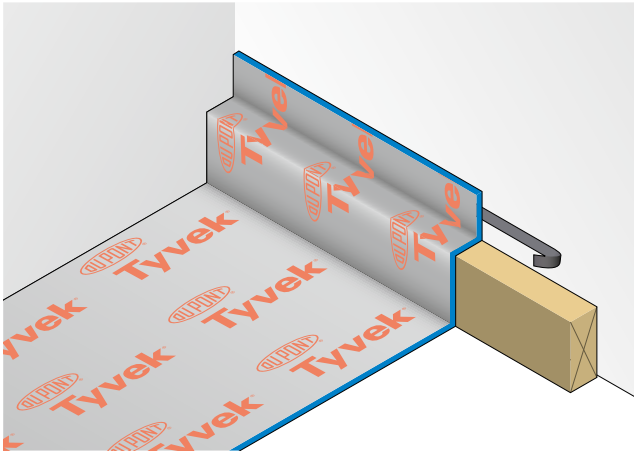


Fig. 36a - Wall junction - joists at right angles

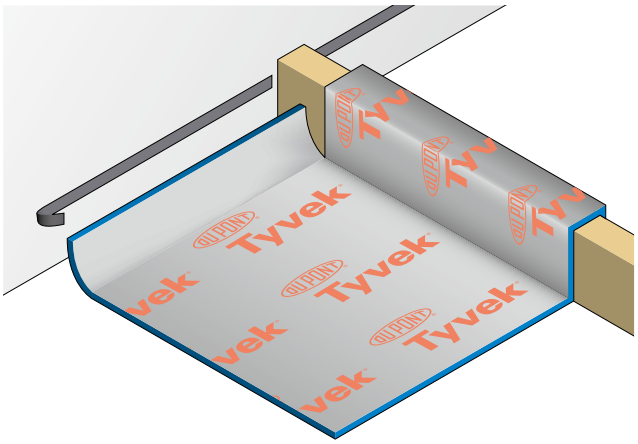
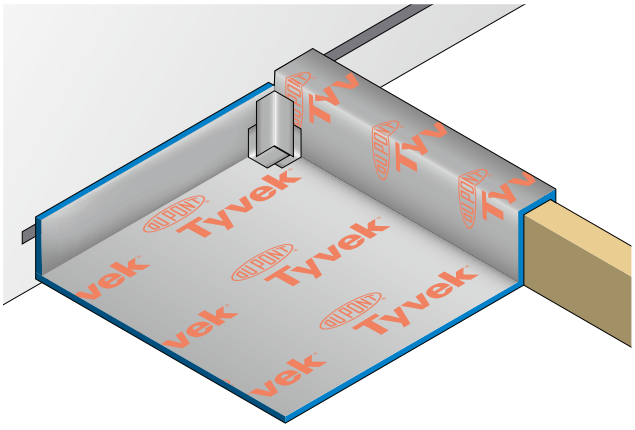


Fig. 36b



Installation

Ideally Tyvek® Supro would be fixed continuously to the underside of the joists, although in most cases this would not be possible as the space beneath the floor would not permit access. The most workable procedure is to wrap the membrane over the joists as in Fig. 35.

Fixing

Tyvek® Supro can be fixed into the tops of the joists using stainless steel staples or galvanised clout nails at approx. 500 mm centres. Fix Tyvek® Supro to the sides of the joists with battens at low level.

Laps and sealing

Laps between each sheet of Tyvek® Supro should be 100mm min. Seal the laps with Tyvek® Acrylic Tape (single-sided) or compress beneath floor boards.

Wall junction - joists parallel

Continue Tyvek® Supro up and over the perimeter joist and lap 100mm against the wall, behind the VCL(if present). Seal Tyvek® Supro to the wall using Tyvek® Butyl Tape (Fig. 36).

Wall junction - joists at right angles

Sealing Tyvek® Supro will be difficult where the joists run into the wall. In order to achieve airtightness, the membrane should be cut, shaped and sealed against the wall and joist. Cuts and edge joints should be made good with Tyvek® Acrylic Tape (single-sided) (Figs. 36a/36b).

Additional notes on sealing

Tyvek® Supro should also be sealed against a VCL in the wall using Tyvek® Butyl Tape, Tyvek® Double-sided Tape and/or Tyvek® Acrylic Tape (single-sided).

Service penetrations through the Tyvek® membrane should be sealed using Tyvek® Butyl and/or Tyvek® Acrylic Tape (single-sided).

Internal layers

A further reduction in air leakage can be achieved by installing DuPont™ AirGuard® Control, Smart or DuPont™ AirGuard® Reflective with taped laps directly beneath the internal floor finishes. The membrane can be installed either above or beneath the floor boarding to form a continuous internal vapour control layer and air leakage barrier.

DuPont™ Tyvek® membranes wall and floor applications

Specification: Suspended Timber Floors

Breather membrane/insulation support membrane

Shall be Tyvek® Supro as
manufactured and sold by
DuPont de Nemours (Luxembourg) S.à r.l.
and serviced by

DuPont Performance Building Solutions
HERE
470 Bath Rd,
Arno's Vale,
Bristol BS4 3AP

Main Office: +44 (0) 117 452 9050
Option 1 for Technical assistance
Option 2 for Pricing and enquiries
Option 3 for Invoicing, Order acknowledgments and customer order processing

Laying - continuously beneath floor joists
(if access permits)
Unroll Tyvek® Supro at right angles to timber joists and secure with stainless steel staples or corrosion resistant nails. Fix at max. 300 mm centres along each joist.

Laps
Maintain min. 100 mm laps between each sheet and seal with Tyvek® Acrylic Tape (single-sided).

Laying – wrapped over floor joists
Unroll Tyvek® Supro so that it is laid at right angles to the timber joists. Form the membrane over the tops and down the sides of the joists.

Fixing - with battens
Fix Tyvek® Supro with stainless steel staples or corrosion resistant nails at min. 500 mm centres along the tops of each joist. Secure Tyvek® Supro to the sides of the joists at lower level using battens of 19 x 38 mm min.

Fixing - without battens
Fix Tyvek® Supro with stainless steel staples or corrosion resistant nails at max. 300 mm centres along the tops of each joist.

Laps
Maintain min. 100 mm laps between each sheet and seal with Tyvek® Acrylic Tape (single-sided).

Wall junction
Bond Tyvek® Supro to the wall AVCL with Tyvek® Butyl Tape, ensuring overlap of 100 mm min. If cutting around joists make good to cuts and joints using Tyvek® Acrylic Tape (single-sided) or Tyvek® FlexWrap NF.

Sealing – additional notes
Service penetrations through the Tyvek® membrane should be sealed using Tyvek® FlexWrap EZ.

DuPont™ AirGuard® AVCL's - Wall Applications

To compliment Tyvek® Reflex with a low emissivity internal membrane DuPont has developed DuPont™ AirGuard® Reflective – a completely airtight vapour control layer (VCL) that will also improve the wall's thermal performance. DuPont™ AirGuard® Reflective is designed to provide effective control against interstitial condensation both by diffusion and by convection. The membrane will reduce convective heat loss through the wall construction as well as retaining heat by reflecting it back in.

Installing DuPont™ AirGuard® Reflective behind a plasterboard internal lining will provide the following benefits:

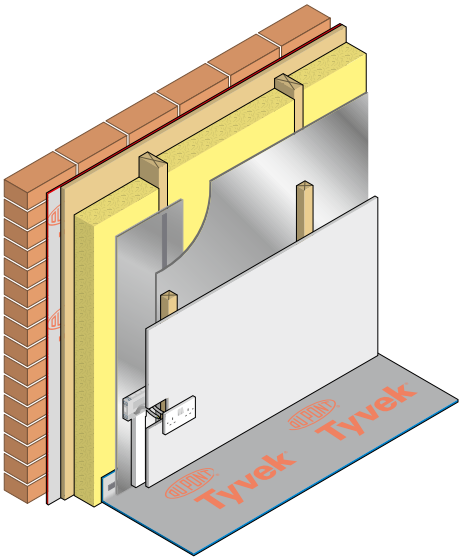
- **Airtightness**
- **Vapour Control**
- **Thermal comfort**

Airtightness

Heat loss by convection isn't something that is highlighted by a standard U-value calculation, but is a significant cause of energy loss nonetheless. As we progress into the future with more energy efficient and sustainable building methods we are becoming more aware of the shortcomings of uncontrolled air leakage. Compliance with building regulations and technical standards is demonstrated by successful pressure testing in accordance with procedures given in Technical Standard 1 of the ATTMA (Air Tightness and Measurement Association).

As it currently stands in the UK, it is quite common for our buildings to be achieving air leakage levels of between 3 and 5m3/hr/m2@50Pa (maximum - Scotland is 7m3/m2/hr), which is clearly better than the 10m3 limit stipulated by Building Regulations. Even so, the UK is seriously lagging behind other European countries whose upper limits are very often Passive House at below 1m3.

Fig. 28 – DuPont™ AirGuard® Reflective installation



Uncontrolled air leakage occurs through gaps between and around insulation layers and through hairline cracks in plasterboard linings. These invariably occur during the building drying out process, but are also caused by settlement and thermal movement over the life of the building. Any layer in the building envelope where total continuity is not achieved is a potential weak point.

Vapour Control

DuPont™ AirGuard® Reflective offers high resistance to the passage of water vapour both by diffusion and convection. When installed continuously with all laps and penetrations sealed, the membrane will provide effective condensation control for all building types. This includes those of high humidity class, eg. swimming pools, textile factories, etc.

Thermal comfort

The metallised face of DuPont™ AirGuard® Reflective presents a low emissivity surface on the internal side of the wall construction. When used with a small airspace the membrane will reflect internally generated heat back into the building providing a back-up to traditional insulation. This reduction in heat transmission allows the airspace thermal resistance to be increased to 0.67 m^2K/W. This will improve to the overall U-value of the wall system thus helping to reduce heating costs.

Pages 32 & 33 show likely U-values to be expected when using DuPont™ AirGuard® Reflective as the VCL in metal frame wall systems with standard stud sizes. Figures for standard breather membrane vs Tyvek® Reflex also included.

DuPont™ AirGuard® Reflective General Notes

Orientation

For airtightness and vapour control, the orientation of DuPont™ AirGuard® Reflective is unimportant, but to utilise the membrane's thermal capacity its reflective surface must always face into an airspace. The preferred method is to install it with the reflective side facing into the building and then to fix a standard 25 mm batten over the membrane as described in the installation notes under batten space.

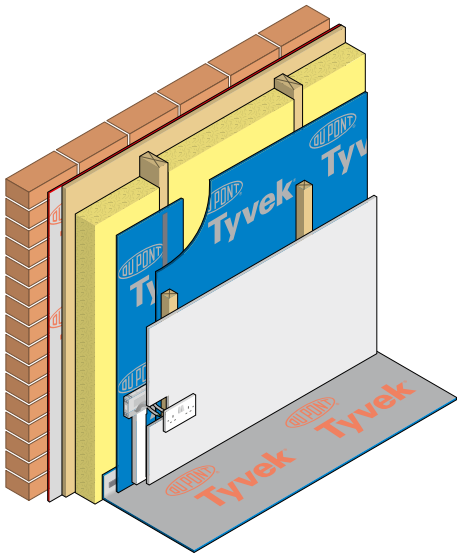
Continuity and sealing

As a vapour resistant and airtight membrane it is important to ensure DuPont™ AirGuard® Reflective is installed continuously with no breaks or open joints where air leakage can occur. All laps, penetrations and cuts in the membrane should be sealed with Tyvek® Butyl Tape may also be used with the batten to seal fixing penetrations.

DuPont™ AirGuard® Control General Notes

Installing DuPont™ AirGuard® Control as part of the internal lining will minimise uncontrolled convected heat losses through the building fabric. The objective is to provide a continuous barrier to air movement around the habitable space that is in contact with the inside of the thermal insulation layer. This includes separating walls and the edges of intermediate floors.

Fig. 32 – DuPont™ AirGuard® Control installation



DuPont™ AirGuard® Control has been specifically developed for use as an air leakage barrier (ALB), but will also contribute in controlling the passage of vapour through a structure. Its use is particularly applicable in 'vapour open' wall constructions where external layers are of low vapour resistance.

Installing DuPont™ AirGuard® Control as the AVCL will ensure that the overall 'breathability' of the construction is maintained with the correct balance of vapour resistances between internal and external layers. (See page 18 - The '5 times rule')

Composition

DuPont™ AirGuard® Control is composed of a layer of spunbonded polypropylene with a polyolefin coating.

Strength

DuPont™ AirGuard® Control is rot proof and has a nail tear resistance of 210N. It is an extremely durable material.

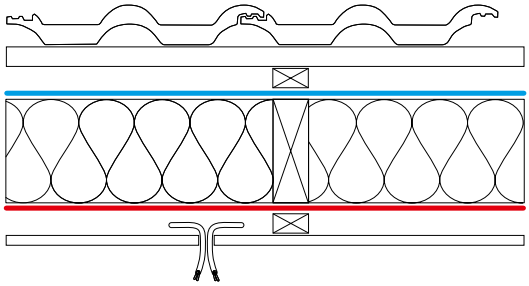
Note: When installing DuPont™ AirGuard® Control the installation procedures for DuPont™ AirGuard® Reflective should be followed. Total continuity of DuPont™ AirGuard® Control is paramount to achieve successful pressure testing at 50 Pa.

AirGuard® Reflective Installation Sheet

AirGuard® Control Installation Sheet

Installation: DuPont™ AirGuard® AVCLs

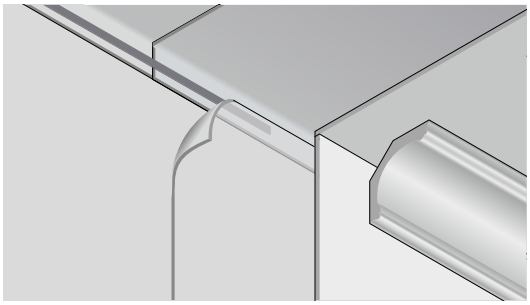
1 - Service Void



Detailing
The integrity of a DuPont™ AirGuard® AVCL is essential for it to perform as an effective vapour control layer and air leakage barrier. The internal lining (plasterboard, etc.) may be fixed directly through the membrane if required. However, for maximum efficiency and best practice the internal lining can be fixed via battens to minimise penetrations through the membrane. Installing battens will also create a services void for wiring and pipework (Detail 1). (See also Fig.28 & Fig.32)

Continuity of the membrane should be maintained at adjacent walls, floors and roofs with Tyvek® Butyl Tape (Detail 2)

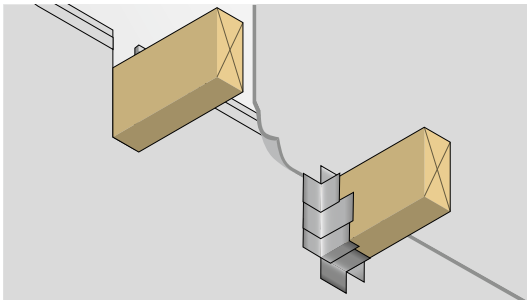
2 - Wall to ceiling junction



Wall - upper storey floor joists
Note: To ensure continuity, the DuPont™ AirGuard® AVCL must be installed before installation of plasterboard to the ceiling and boarding to the upper floors.

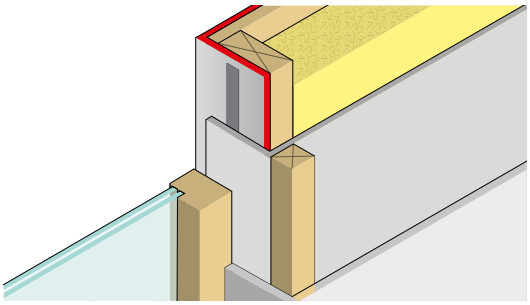
Extend the DuPont™ AirGuard® AVCL above ceiling/ floor joists by a minimum of 100mm. Cut and dress the membrane around all joists and make good/seal with Tyvek® 2060B Tape. Bond the membrane to upper storey sheets using Tyvek® Butyl Tape (Detail 3).

3 - Penetrations



Penetrations
Penetrations through the DuPont™ AirGuard® AVCL should be kept to a minimum and any that are made should be sealed. Penetrations for pipework, wiring and electrical sockets should be sealed with Tyvek® 2060B Tape, Tyvek® Metallised Tape or DuPont™ FlexWrap EZ (Detail 3).

4 - Window/door frame sealing



Windows/doors
The DuPont™ AirGuard® AVCL should be made vapour and convection tight at all window and door openings. The membrane should be dressed neatly into the reveal and sealed to the frame with Tyvek® 2060B Tape or Tyvek® Double Sided Acrylic Tape. The membrane may be compressed by the frame if the windor/door unit is to be fitted retrospectively (Detail 4). The membrane should be made good at door and window corners with Tyvek FlexWrap EZ.

Damage
If a DuPont™ AirGuard® AVCL is abraded or punctured in any way the damaged area should be made good with Tyvek® 2060B Tape or Tyvek® Metallised Tape. Extensive damage should be covered with a patch made from the same material and sealed with Tyvek® 2060B Tape or Tyvek® Metallised Tape.

Detailing wall systems - AirGuard® membranes

Internal AVCL Fixing

DuPont™ AirGuard® Reflective and AirGuard® A2 FR are the most suitable membranes for internal application in SFS systems. Both membranes have high vapour resistance, are 100% airtight and have low emissivity (reflective) surfaces.

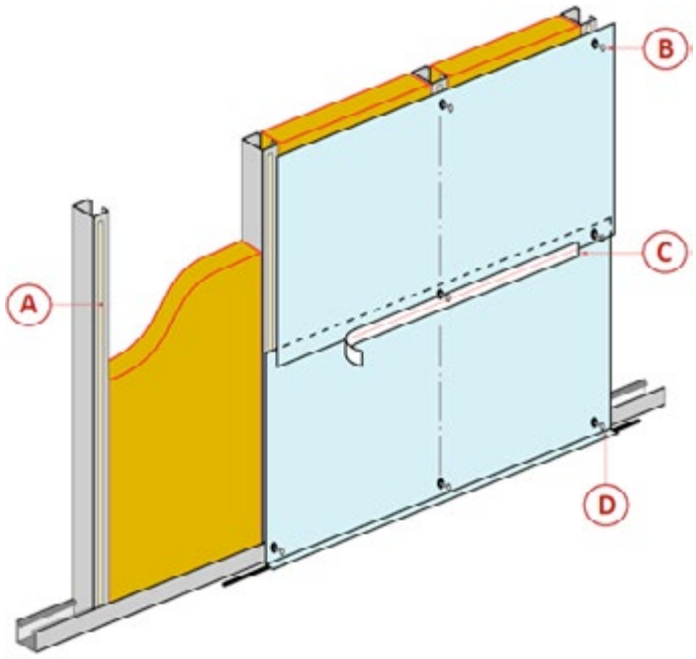
Key to SFS AVCL diagram

A. Continuous strip of Tyvek® Double-Sided Tape applied to all studs.

B. Drill-tip (self-tapping) screw with EPDM or rubber washer fixed into metal stud, through membrane and Tyvek® Double-Sided Tape.

C. All laps & penetrations in DuPont™ AirGuard® AVCL to be sealed with Tyvek® Metallised Tape. When fire resistance is important all laps & penetrations in DuPont™ AirGuard® A2 FR AVCL to be sealed with DuPont™ AirGuard® FR System Tape.

D. AVCL dressed forward and sealed to floor with continuous strip of Tyvek® Butyl (double-sided) Tape



Above: DuPont™ AirGuard® AVCL – Installation onto SFS wall

Separating (Party) Walls

A party wall in domestic properties commonly refers to the dividing wall between adjoining semi-detached or terraced properties. In many cases the details and specifications can be shared with commercial projects such as offices, schools, sports and medical facilities. The purposes of each building can have an influence on the design and choice of building fabric, but in essence the principles of separation are common to all.

The various rooms or compartments incorporated within a commercially oriented building can often have very different functions from each other. The individual use of the rooms, the occupancy level, the appliances used within, the temperature and humidity and the specific requirements for ventilation make 'separation' a key factor in building design. It is important therefore that the environmental conditions that prevail within each room are maintained as efficiently as possible. This guidance is intended to offer typical examples of efficient and buildable solutions to achieve these goals, using a DuPont™ AirGuard® AVCL.

Performance factors to consider

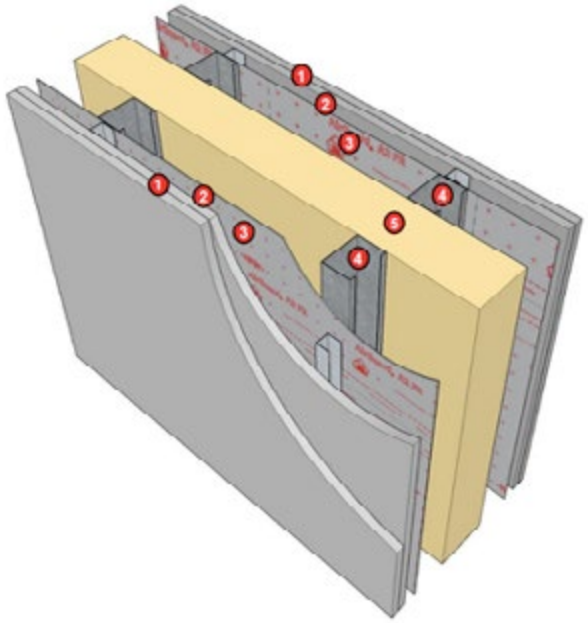
Energy Efficiency **Durability** **Moisture Control**

Air Quality **Sound Proofing** **Fire Safety**

Separating (Party) Walls

Separating (Party) Walls

Steel frame: Double-stud system (Lightweight)



This diagram shows a Double-stud SFS separating wall, suitable for lightweight steel frame houses and apartments. A flexible semi-rigid insulation fitted in the cavity, separates the twin steel frames. Either side is AirGuard® A2 FR AVCL providing airtightness, vapour control and fire safety, helping to maintain the individual air quality and energy efficiency characteristics between zones.

Seperating wall build-up

1. 2 layers of 15mm sound insulating plasterboard
2. Services void
3. DuPont™ AirGuard® AVCL (AirGuard® A2 FR)
4. Metal stud
5. Flexible insulation

Steel frame: Double-stud system

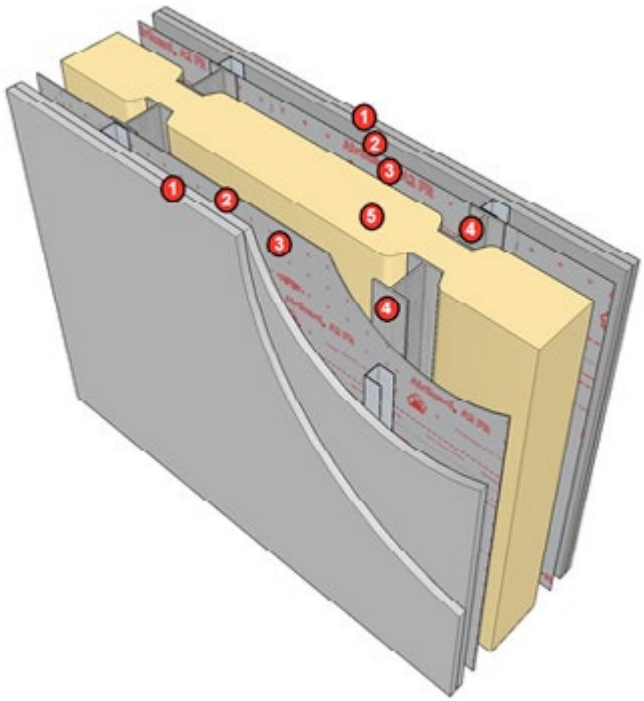


Diagram shows a steel frame 'Double-stud' separating wall system, which would **only be used with a reinforced concrete frame construction**. Components are similar to the previously shown lightweight system, but with a compressible semi-rigid insulation fitted in the cavity, separating the twin steel frames. AirGuard® A2 FR AVCL is installed on both sides to provide airtightness, vapour control and fire safety, helping to maintain the individual air-quality characteristics between zones.

Separating wall build-up

1. 2 layers of 15mm sound insulating plasterboard
2. Services void
3. DuPont™ AirGuard® AVCL (AirGuard® A2 FR)
4. Metal stud
5. Flexible insulation

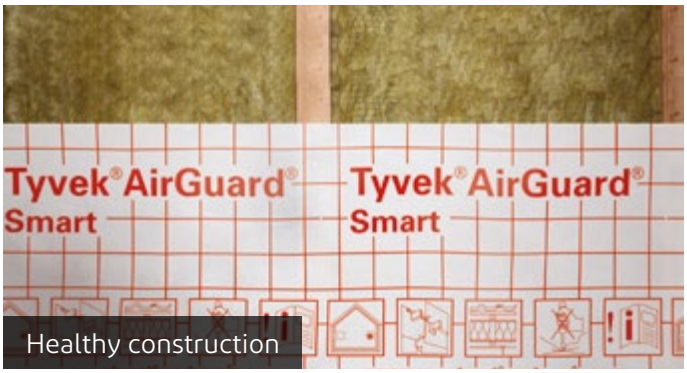
Recommended AVCL for separating wall systems:

DuPont™ AirGuard® A2 FR

How Tyvek® AirGuard® Smart works

Tyvek® AirGuard® Smart prevents structure damage and loss of insulation efficiency by smartly adapting to various moisture conditions and regulating the humidity in building elements.

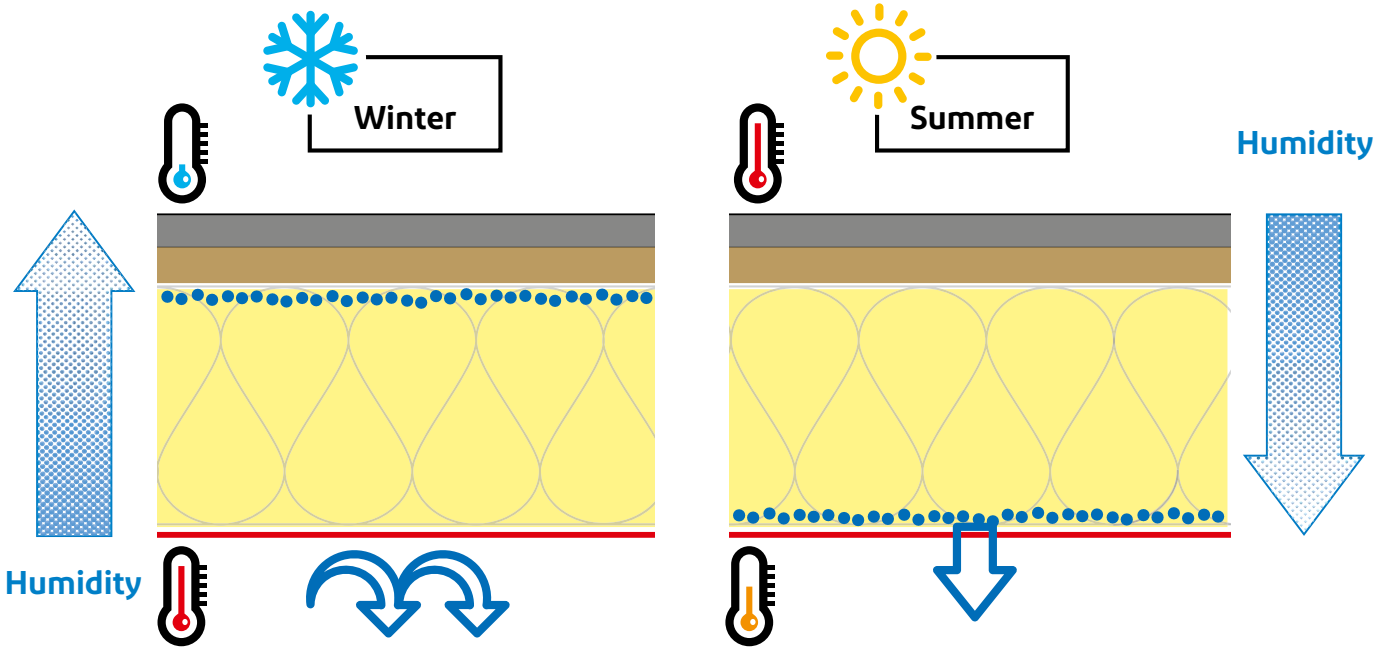
Mould damage due to trapped moisture



Healthy construction

Tyvek® AirGuard® Smart adapts:

- to allow faster evacuation of built-in humidity in new construction elements (e.g.: wet rafters)
- to avoid humidity infiltration from the living space into the construction elements during winter
- to allow moisture trapped in the structure to escape to the building interior



High vapour resistance

Very little moisture is entering the construction from the inside

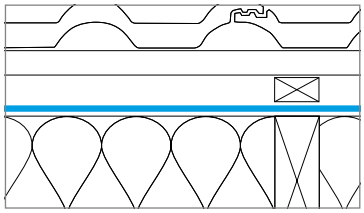
Low vapour resistance

Excessive moisture trapped in the construction can evaporate to the inside

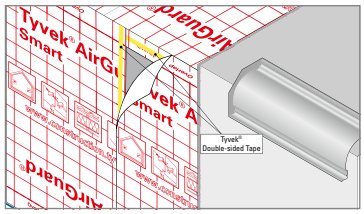
Typical applications	Benefits
New construction	Reduced drying out time. Drying out by moisture migrating back into the building
Renovations from the exterior	Allows continuous installation of AVCL from the outside without risking condensation to the upper side of rafters
Flat and pitched roofs with HR (High Resistance) underlay	Only an adaptive AVCL allows drying out in this type of application
Use a standard AVCL *	

Installation Guidelines

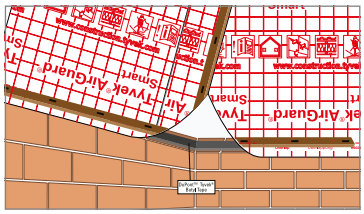
1 - Service Void



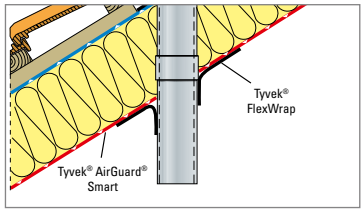
2 - Wall to ceiling junction



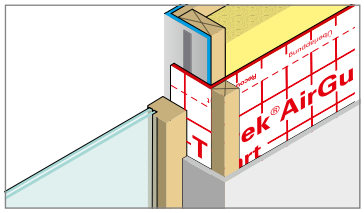
3 - Ceiling Masonry junction



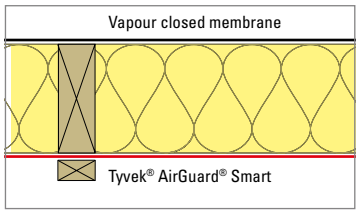
4 - Penetrations



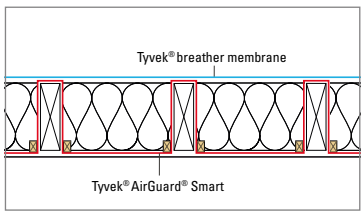
5 - Window/door frame sealing



6 - Flat roofs



7 - Renovation from the exterior



Tyvek® AirGuard® Smart is suitable for installation into many types of construction element; timber frame/SFS wall systems, suspended floor applications, flat roofs, cold and warm pitched roofs. Applications range from new-build, right through to existing problematic projects where refurbishment work is needed.

Detailing: The integrity of Tyvek® AirGuard® Smart is essential for it to perform as an effective vapour control layer and air leakage barrier. The internal lining (plasterboard, etc.) may be fixed directly through the membrane if required. However, for maximum efficiency the internal lining can be fixed via battens creating a service void which will also help to minimise penetrations (Fig. 1).

Continuity of the membrane should be maintained at adjacent walls, floors and roofs with Tyvek® Butyl Tape or Tyvek® Double-sided Tape (Fig.2).

Ceiling Masonry junction: Tyvek® Butyl Tape may be used to seal Tyvek® AirGuard® Smart to masonry surfaces. Tyvek® Butyl Tape may also be used to seal fixing points. Note: Where practicable, timber battens are recommended to fix Tyvek® AirGuard® Smart to any adjacent surfaces (Fig. 3).

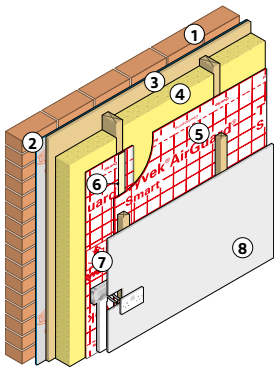
Penetrations and making good: Penetrations through the membrane should be kept to a minimum and any that are made should be sealed. All membrane laps should be sealed with Tyvek® Acrylic Tape, and penetrations for pipework, wiring and electrical sockets should be made good with Tyvek® FlexWrap (Fig. 4).

Windows/doors: Tyvek® AirGuard® Smart should be installed convection tight at all window, door and hatch openings. The membrane should be sealed with Tyvek® Butyl Tape or tucked in and compressed by the frame (Fig. 5) Corners are best sealed with Tyvek® FlexWrap.

Flat roofs: A typical application for Tyvek® AirGuard® Smart is in flat roofs (Fig. 6).

Roof renovation from the exterior: In specific cases Tyvek® AirGuard® Smart may be installed from above, with the membrane installed 'up-and-over the rafters/joists (Fig. 7). For information on this installation please contact our BKC Technical Office: 0117 970 9454/9455

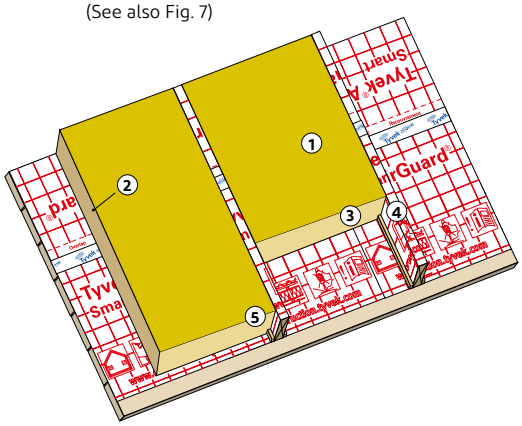
Wall installation



1	Cladding
2	Tyvek® breather membrane
3	Sheathing
4	Insulation
5	AVCL Tyvek® AirGuard® Smart
6	Tyvek® Butyl Tape
7	Service void
8	Plasterboard

Renovation from the exterior

(See also Fig. 7)



1	Insulation
2	Tyvek® Acrylic Tape
3	AVCL Tyvek® AirGuard® Smart
4	Timber batten
5	Plasterboard

Class A2 Non-Combustible Breather Membrane DuPont™ Tyvek® Trifecta™

Weather protection membrane for external wall systems

- Full A2-s1,d0 system:
  - DuPont Tyvek® Trifecta™ breather membrane (1.5m x 25m)
  - DuPont AirGuard® A2 FR AVCL (1.2m x 50m)
  - DuPont AirGuard® FR System Tape
- Suitable for use over any A1/A2 mineral boards
- Unrestricted use for high risk buildings, including height and proximity across the UK and Ireland
- Suitable for all building types including 'high risk'
- 6 months free exposure to UV
- Airtight for best possible heating and cooling savings
- W1 water resistance to EN 1928 (A) for effective weather protection
- Low vapour resistance for condensation control
- Extremely robust, with exceptional strength characteristics
- 25 year warranty

Class A2 Fire Retardant AVCL Membrane DuPont™ AirGuard® A2 FR

Airtight Vapour Control Layer for use within the internal lining of roof, ceiling and wall systems

FIRE RETARDANT

DuPont™ AirGuard® A2 FR AVCL: a Fire Retardant Airtight Vapour Control Layer for use within the internal lining of roof, ceiling and wall systems. Enhancing the building fabric in terms of airtightness, energy efficiency and moisture management, improving indoor air quality and providing exceptional fire safety to the building and its occupants.

Surpassing the Fire Regulations

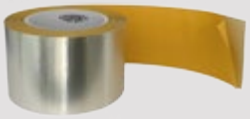
Today the fire performance of materials used in buildings is under closer scrutiny than ever before and the regulations continue to be updated. DuPont has introduced a step change in their building membranes offering: a fire retardant AVCL with European Fire Classification A2.

Membrane & Tape System – Independent Classification: A2-s1,d0

For DuPont™ AirGuard® A2 FR AVCL to provide effective airtightness and vapour control it is crucial that all laps, junctions and penetrations are sealed. In order to give assurance that a complete system is 'fire-safe,' a full system test, including horizontal and vertical lap sealing with DuPont™ AirGuard® FR System tape has been successfully tested according to EN 13501-1 at the Prüfinstitut Hoch ➔ Classification Report, KB-Hoch-200148-5, 18.08 2021.

DuPont™ AirGuard® A2 FR AVCL & tape system advantages at a glance

- Fire-retardant
- Reaction to fire: A2-s1, d0 to EN 13501-1: 2007+A1:2009
- AirGuard® A2 FR AVCL and DuPont™ AirGuard® FR System tape



DuPont™ AirGuard® FR System Tape 1310FR

- Tested and classified for free-span, on mineral wool slab, gypsum plasterboard or fibre cement board
- Fire Classification surpasses all national building regulations and standards for construction materials used in walls in the UK and Ireland
- Suitable for all building types, heights and proximities
- High vapour resistance, limiting interstitial condensation
- Suitable for high humidity buildings, such as swimming pool halls etc
- Thermal benefit; low emissivity/reflective surface
- 100% Airtightness
- Extremely robust
- Exceptional tear and tensile strength characteristics
- 25 year warranty

THE DUPONT™ TYVEK®
BUILDING KNOWLEDGE CENTRE
www.building.dupont.co.uk

Tyvek® FireCurb® breather membrane advantages at a glance

- Compliance with national fire regulations and standards for use in high-rise buildings
- Reaction to fire: B-s1,d0
- Self-extinguishes when ignited - limits propagation of flames
- Class W1 essential water resistance to EN 13859
- Halogen-free flame retardant coating considerably limits the formation of droplets and reduces smoke
- Greater safety during and after installation
- Long term investment protection
- Has all the tried, tested and trusted properties Tyvek® is known for
- Strong technical support for all Tyvek® and AirGuard ® products

DuPont™ Tyvek® FireCurb® breather membrane

breather membrane for use in the external lining of wall systems

FLAME RETARDANT

Tyvek® FireCurb® breather membrane: a flame retardant breather membrane for buildings based on a new patented technology, enabling a Euroclass B (EN 13501-1) that potentially saves lives and could prevent costly damages.

The building breather membrane that limits the propagation of flames

DuPont introduced a new level of building protection with the flame retardant breather membrane Tyvek® FireCurb®. When flames meet Tyvek® FireCurb®, they literally stop, die down... and go out.
The membrane includes all of the well-known properties of Tyvek®, adding flame retardancy for even more comprehensive protection of walls.

Tyvek® FireCurb® breather membrane advantages at a glance

- Compliance with national Fire Regulations & Standards for use in high-rise buildings
- Reaction to fire: B-s1,d0
- Self-extinguishes when ignited - limits propagation of flames
- Halogen-free flame retardant coating considerably limits the formation of droplets and reduces smoke
- Greater safety during and after installation
- Long term investment protection

- Includes all durable Tyvek® characteristics essential for energy efficient and condensation free buildings:
  - Class W1 water resistance to EN 13859
  - Vapour resistance meets BS 5250 guidance for breather membranes (<0.6 MN.s/g)
  - **IMPORTANT**: Not all fire retardant breather membranes, on the market, reach the required sd and water vapour resistance standard <0.6MN.s/g

DuPont™ AirGuard® A2 FR AVCL

Properties CE	Nominal
Style name and D code	5816X (D Code:- D15561632)
Roll size	1.2m x 50m
Thickness	0.15 mm
Mass per unit area	165 g/m²
Composition	Laminate of glass fibre-mesh with lacquered Aluminium foil
Reaction to fire* (EN13501-1)	A2-s1,d0 (membrane)
Reaction to fire* (EN13501-1)	A2-s1,d0 (membrane & AirGuard® FR System tape)
Water vapour transmission (Sd)	4.900 m
Water vapour resistance	24.000 MN.s/g
Emissivity	0.05
Thermal resistance (with airspace)	Walls: 0.66 m²K/W / Ceilings: 0.45 m²K/W
Water tightness (EN1928)	Pass (Type A)
Tensile force MD/XD	800/800 (N/500)
Nail tear resistance MD/XD	170/150 (N/50 mm)

Tested freehanging & affixed on underlaying materials with EN13501-1 fire class A1 or A2-s1, d0.

IMPORTANT: To compliment this product, a flame retardant breather membrane should be used on the external side of the wall system. For this purpose, we would recommend you use DuPont™ Tyvek® FireCurb®. Please see www.flameretardant.tyvek.com

DuPont™ Tyvek® FireCurb®

Properties CE	Nominal
Style name and D code	2066B (D Code:- D15085129)
Dimensions / Weight	1.5 x 50 m / 5.5 kg per roll
Composition	Flash-spun-bond HDPE with flame retardant coating
Reaction to fire*	(EN13501-1) B-s1,d0
Temperature resistance	-40 to +100° C
Water vapour transmission (Sd)	0.015 m
Water vapour resistance	0.075 MN.s/g (less than 0.6 MN.s/g to BS 5250:2011)
Mass per unit area	68 g/m²
Functional layer thickness	175 µm
CE-Certificate of Conformity	yes (0799-CPD-128)

*(if installed freehanging, on mineral wool & cementitious boarding--> B-s1,d0 , if installed onto wood --> D-s2,d2)

IMPORTANT: To compliment this product in roof, ceiling and wall systems, a fire retardant air and vapour control layer (AVCL) should be used within the internal lining. For this purpose we would recommend you use DuPont™ AirGuard® A2 FR.

To achieve optimal airtightness, we recommend the use of the following adhesive accessories.

Tyvek® Acrylic Tape

Roll size:
75 mm x 25 m

AirGuard® FR System Tape

Roll size:
75 mm x 25 m

Tyvek® Butyl Tape

Roll size:
20 mm x 30 m or
50 mm x 30 m

Tyvek® Double-sided Tape

Roll size:
50 mm x 25 m

Tyvek® FlexWrap NF/EZ
(Check for maximum tape width permitted)

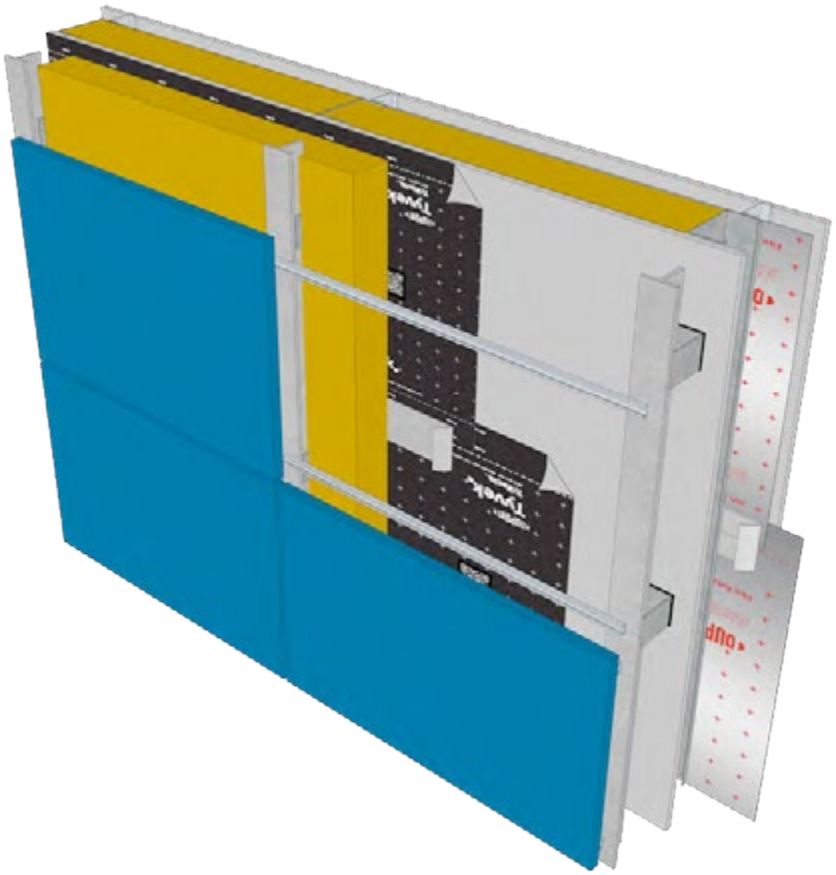
Roll size Tyvek® FlexWrap NF:
15 cm x 23 m

Roll size Tyvek® FlexWrap EZ:
60 mm x 10 m

For more detailed information on all our tapes and accessories please refer to pages 68 - 79.

DuPont™ Tyvek® Trifecta® breather membrane

Breather membrane for use in the external lining of wall systems.



DuPont™ Tyvek® Trifecta®

Properties CE	Nominal
Style name and D code	2021B
Dimensions / Weight	1.5 m x 25m 15kg
Reaction to fire (EN13501-1)	A2-s1,d0
Water vapour transmission (Sd)	0.08 m
Water vapour transmission (Sd)	0.015 m
Mass per unit area	400g/m²
CE-Certificate	Yes
BBA Certificate	N° 90/2548 pending

***Application:** Tyvek® Trifecta™ is typically installed onto the external side of the insulation material or integrated in the wall structure system. It can be used as a solution for ventilated façades.

ENHANCED FIRE AND SMOKE PROTECTION

These tried and tested products not only provide exceptional fire and smoke protection and peace of mind for occupants – they also enhance a building's airtightness and air quality while improving energy efficiency and moisture management.

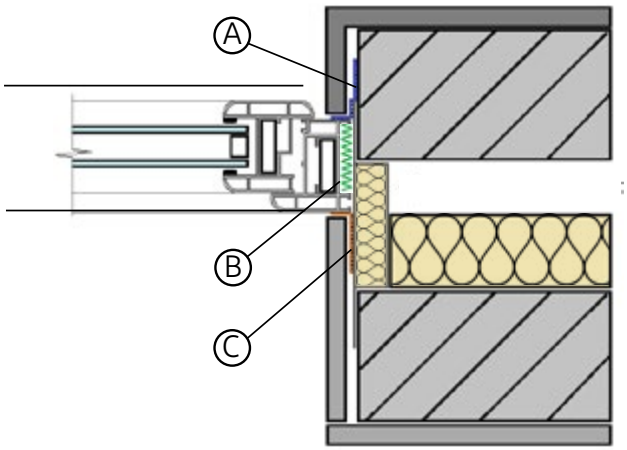
www.FlameRetardant.tyvek.com
www.building.dupont.co.uk
www.energy-efficiency.dupont.com

Examples of window configurations for UK and the Republic of Ireland markets

Fig. 1 - Insulated Blockwork cavity wall (partial fill)

> External render
> Internal plasterboard on dabs

OUTSIDE



INSIDE

Ⓐ DuPont™ Tyvek® Window Tape

Ⓑ DuPont™ Instastik™ Flex (behind frame)

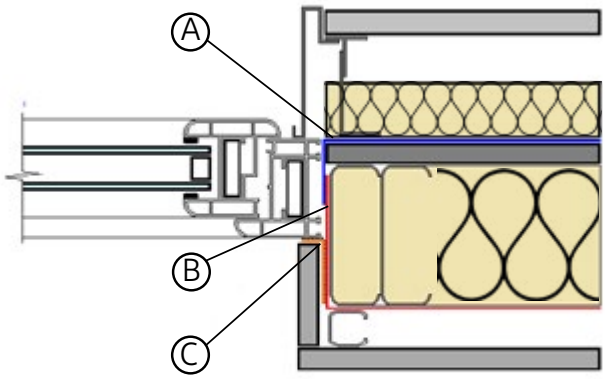
Ⓒ DuPont™ Tyvek® Window Tape or Tyvek® Acrylic Tape

* NOTE: Tyvek® Plastering Tape may be used in areas where render and/or dabs are being applied.

Fig. 2 - SFS Aluminium rainscreen

> External render
> Internal plasterboard on dabs

OUTSIDE



INSIDE

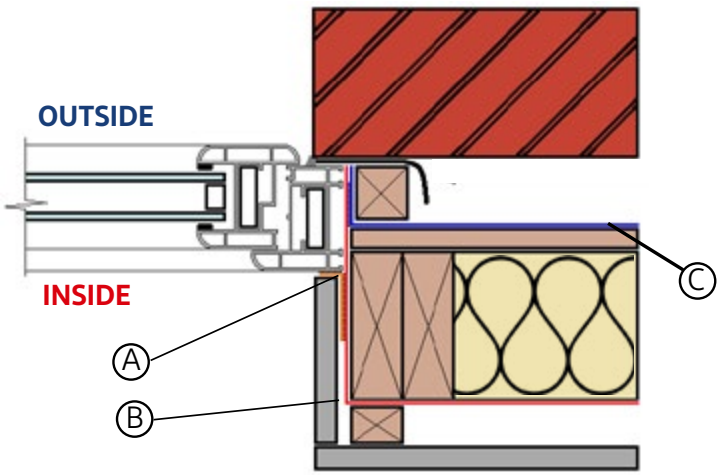
Ⓐ Tyvek® Breather membrane on CP board

Ⓑ DuPont™ AirGuard® AVCL

Ⓒ Internal - Tyvek® Tape

Examples of window configurations for UK and the Republic of Ireland markets

Fig. 3 - Timber frame (brick external leaf)



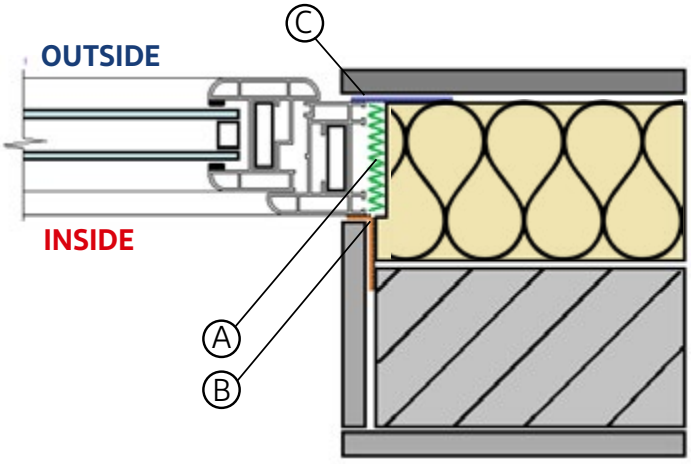
Seal corners with Tyvek® FlexWrap where the AirGuard® AVCL is cut.

Ⓐ Internal - Tyvek® Tape

Ⓑ DuPont™ AirGuard® AVCL

Ⓒ Tyvek® breather membrane

Fig. 4 - External wall insulation (EWI systems / ETICS)



Ⓐ DuPont™ Insta Stik™ Flex (behind frame)

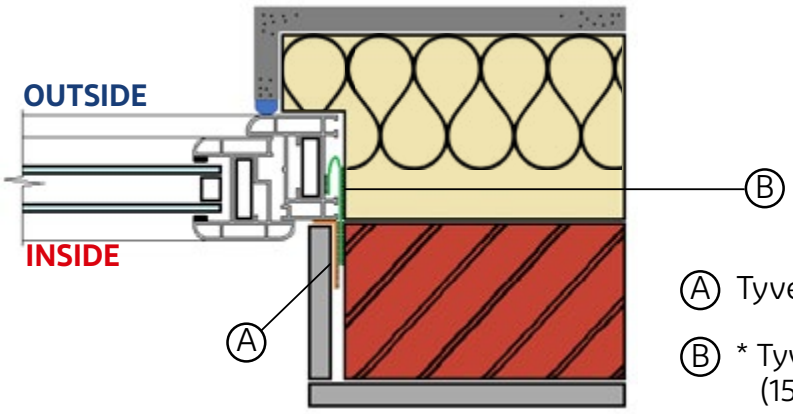
Ⓑ Internal - Tyvek® Tape

Ⓒ Tyvek® Window Tape (15cm) for outside

Examples of window configurations across Europe

New Buildings (Passive houses): Windows inside the insulation layer

Fig. 5



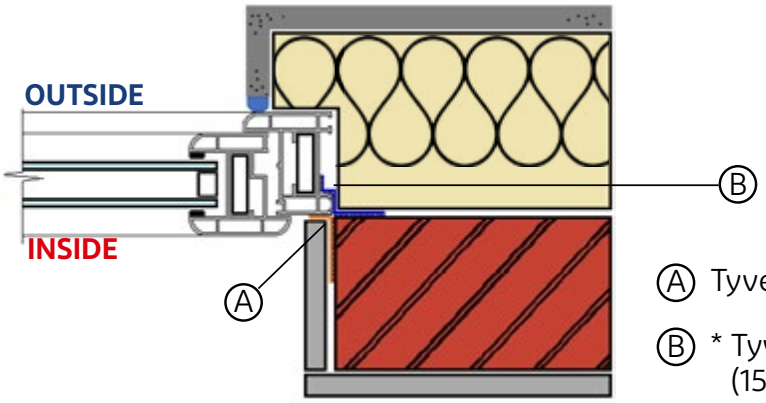
Ⓐ Tyvek® Tape (5cm) for inside

Ⓑ * Tyvek® Window Tape (15cm) for outside

In some European regions national certificates are available attesting that DuPont™ Insta Stik™ Flex Foam can be used without internal air tapes due to its sustainable airtightness.

* NOTE: Some external sealing provisions may not be necessary if the external insulation is being fitted immediately after the window unit.

Fig. 6

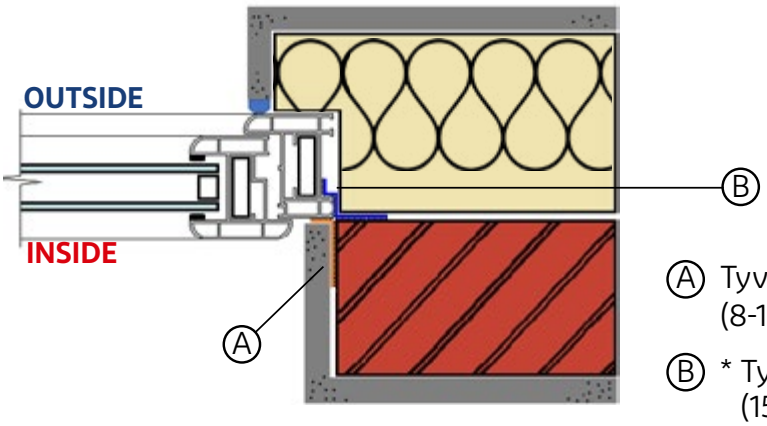


Ⓐ Tyvek® Tape (5cm) for inside

Ⓑ * Tyvek® Window Tape (15cm) for outside

* NOTE: Some external sealing provisions may not be necessary if the external insulation is being fitted immediately after the window unit.

Fig. 7



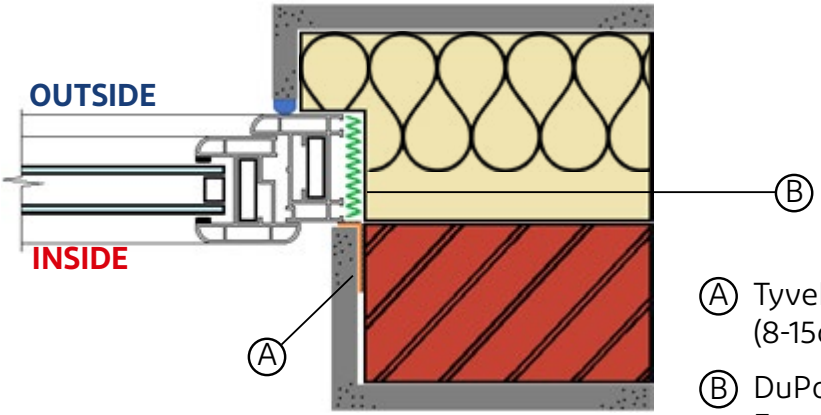
Ⓐ Tyvek® Window Tape (8-15cm) for inside

Ⓑ * Tyvek® Window Tape (15cm) for outside

* NOTE: Some external sealing provisions may not be necessary if the external insulation is being fitted immediately after the window unit.

Examples of window configurations across Europe

Fig. 8

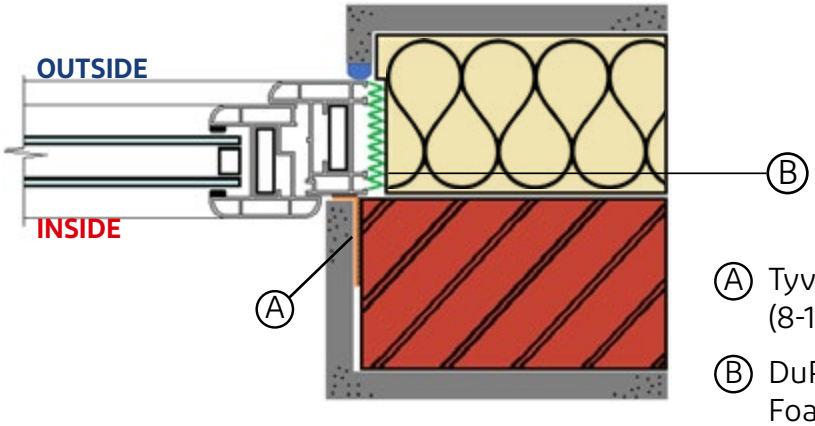


Ⓐ Tyvek® Window Tape (8-15cm) for inside

Ⓑ DuPont™ Insta Stik™ Flex Foam

* NOTE: Some external sealing provisions may not be necessary if the external insulation is being fitted immediately after the window unit.

Fig. 9

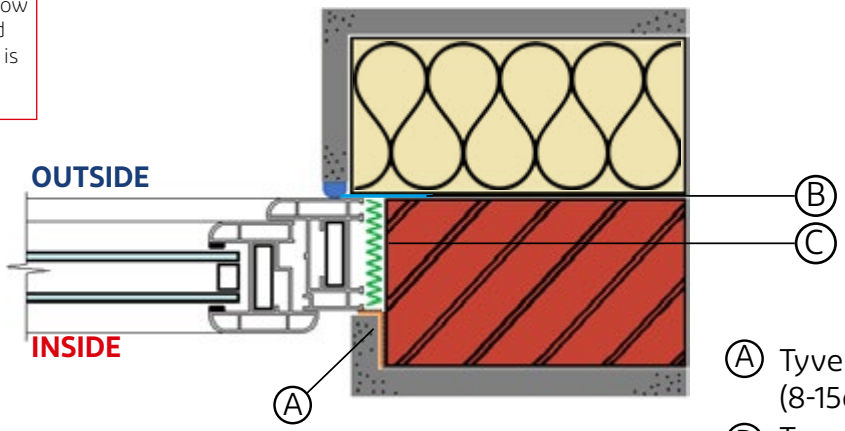


Ⓐ Tyvek® Window Tape (8-15cm) for inside

Ⓑ DuPont™ Insta Stik™ Flex Foam

Fig. 10

External sealing will be necessary as the window unit will be installed before the insulation is fitted.



Ⓐ Tyvek® Window Tape (8-15cm) for inside

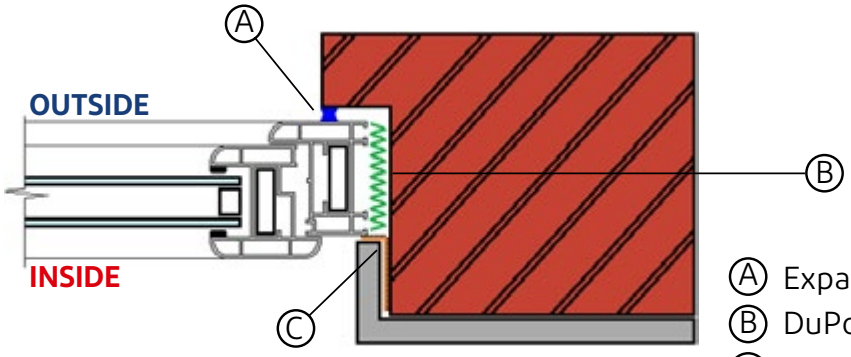
Ⓑ Tyvek® Flexwrap

Ⓒ DuPont™ Insta Stik™ Flex Foam

Examples of window configurations across Europe

The renovation of existing dwellings

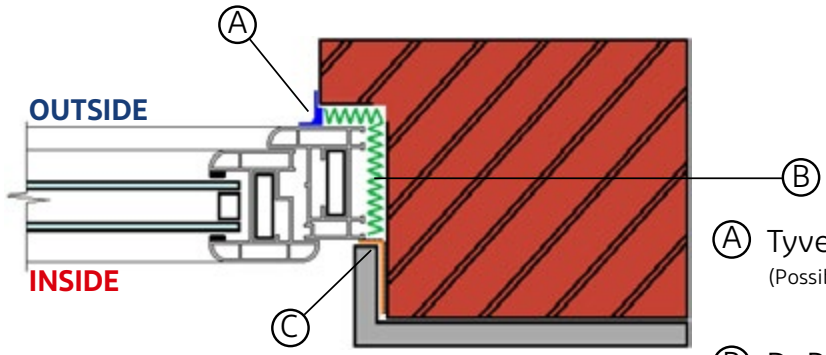
Fig. 11



Ⓐ Expandable Foam Tape
Ⓑ DuPont™ Insta Stik™ Flex Foam
Ⓒ * Tyvek® Tape (5cm) for inside

* NOTE: Tyvek® Window Tape may be used in areas where render and/or dabs are being applied.

Fig. 12

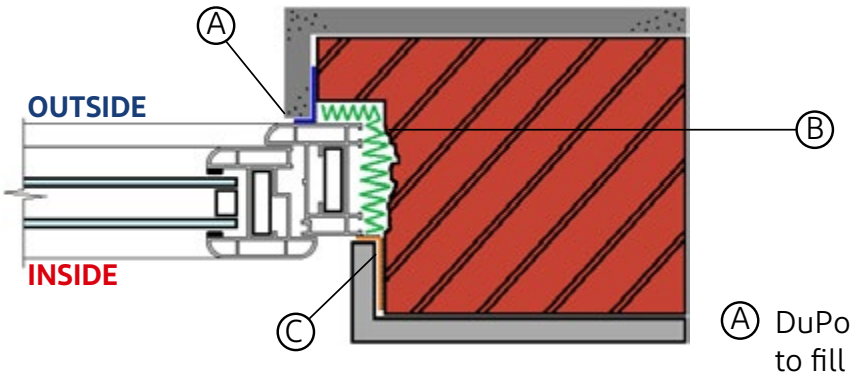


Ⓐ Tyvek® Flexwrap
(Possible if using external cover strip)

Ⓑ DuPont™ Insta Stik™ Flex Foam
Ⓒ * Tyvek® Tape (5cm) for inside

Fig. 13

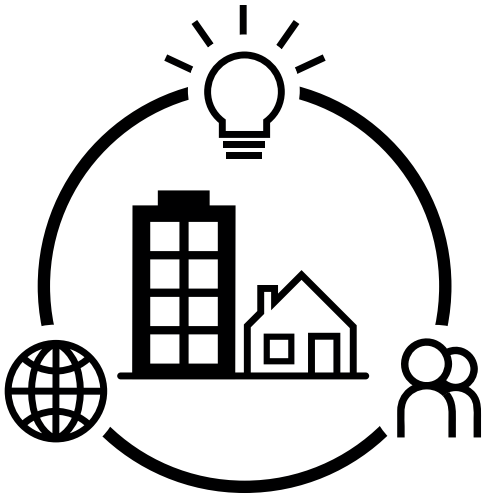
Tyvek® Window Tape



Gaps made in the existing brickwork during window removal may be filled with DuPont™ Insta stick™ Flex.

DuPont™ Froth-Pak™ Mini should be used to fill big holes.

Ⓐ DuPont™ Insta Stik™ Flex Foam to fill the holes generated during renovation work
Ⓑ DuPont™ Insta Stik™ Flex Foam
Ⓒ Tyvek® Acrylic Tape (5cm) for inside



THE DUPONT™ TYVEK® BUILDING KNOWLEDGE CENTRE

- Science you can build on -

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www.energy-efficiency.dupont.com

The DuPont™ Tyvek® Building Knowledge Centre is a resource for building envelope installation and design best practices. It's a dedicated source for information about evolving building regulations, sustainable building practices and air, water and thermal management, that can help you:

- Select building envelope materials and techniques
- Meet or exceed building standards
- Enhance energy efficiency
- Protect interior air quality
- Improve building durability
- Increase job site efficiency
- Develop project-specific specifications and plans.

We also have a Technical Library which has all our data sheets, installation guides & certificates e.g. BBA, NSAI, CE...

You can contact the technical department by email or phone on:

Technical: 0117 452 9050 Option 1
Sales: Option 2 for pricing enquiries
Technical E-mail: tyvek.construction@dupont.com

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- Calculations e.g. Condensation, U-Value...
- Training, Site visits and Hands on Toolbox Talks
- CPDs
- BIM library
- Desktop Design Reviews
- Plus many more types of support

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