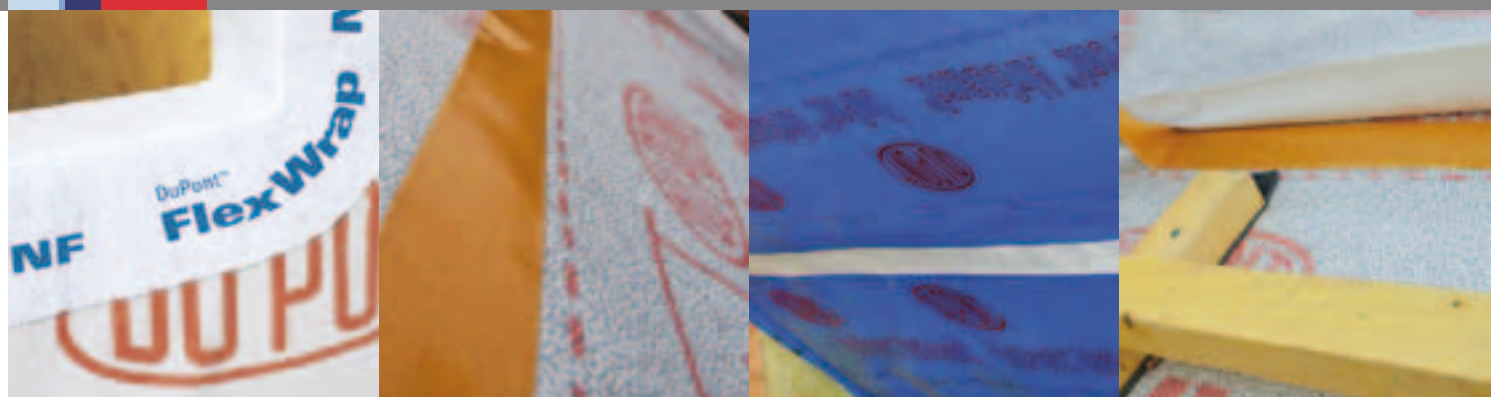




**Energy efficient solutions from  
DuPont™ Tyvek® and DuPont™ AirGuard®**  
BUILD AIRTIGHT AND CONDENSATION FREE



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**Tyvek®**

# Building airtight substantially improves energy efficiency



## Why is airtightness so important?

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. Heat loss by convection isn't something that is highlighted by a standard U-value calculation, but is a significant cause of energy loss and carbon emissions nonetheless. By limiting the leakage of heated/conditioned air from buildings, it is possible to reduce energy consumption and costs.

The European Commission made commitments to reduce carbon emissions through the European Energy Performance of Buildings Directive (EPBD). It shall assist upon request Member States in setting up national or regional financial support programmes with the aim of increasing energy efficiency in buildings.

## Achieve optimal airtightness and long-term performance

The energy efficiency of a building can be significantly improved by making the inside of the building airtight and vapour resistant. 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.

Air & vapour control layers (AVCL's) suitable for roofs, walls and floors help to reduce convective heat losses but also provide highly engineered vapour control for breathing systems. When installed continuously with all laps and penetrations sealed, an AVCL will provide effective condensation control and airtightness for all building types. With an ever increasing requirement to conserve energy the portfolio of DuPont™ Tyvek® products can help you achieve these environmental goals.

## Air & vapour control layers (AVCL's) DuPont™ AirGuard® - Optimal protection from the inside

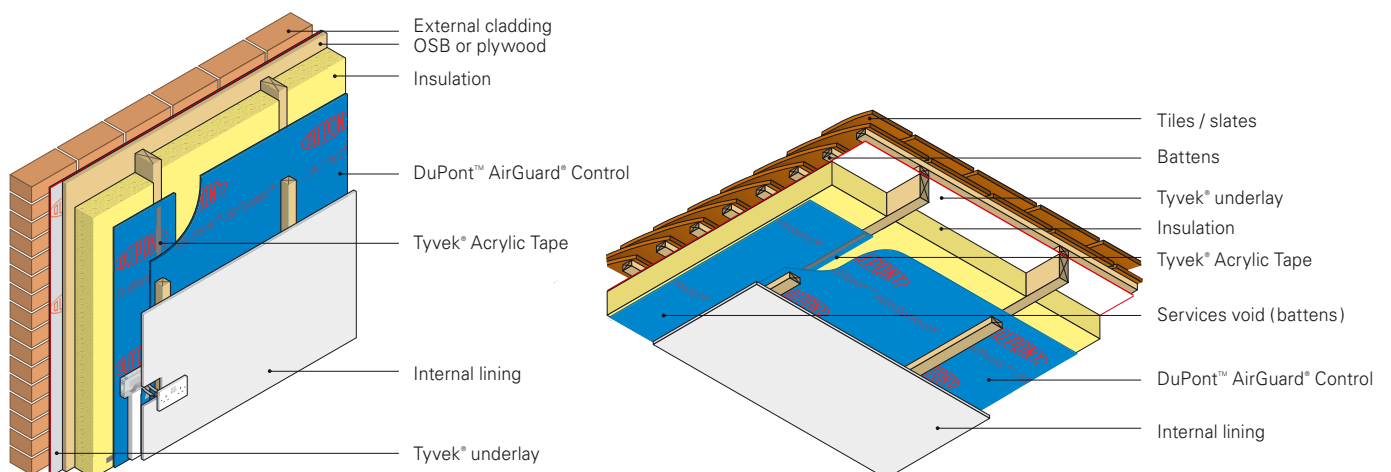
Due to the new regulation coming from the European Energy Performance of Buildings Directive, the requirements on the energy performance of buildings have been increased. Because of air leakage from the building interior, heat losses through convection can occur. Choosing the right air & vapour control layer (AVCL) will help create a thermally efficient, condensation-free structure.

Installing one of the DuPont™ AirGuard® AVCL generics will keep the insulation and wall structure dry and can help to reduce the energy consumption. On top of choosing the right AVCL it is important to make the building envelope airtight and windtight by sealing gaps between and around insulation layers, AVCL's and breather membranes. With DuPont accessories you can choose the right products to complement and enhance Tyvek® building envelope solutions. The adhesive tapes are specially designed for use with DuPont membranes to help reduce uncontrolled air leakages.

The complete system works with the internal ventilation regime to allow a controlled flow of air in and out of a building, helping to maintain internal temperature in both summer and winter and reduce energy costs. By using DuPont accessories and DuPont vapour control layers the entire roof structure adheres to the principle of "vapour-open & airtight". The system will ensure compatibility with the Tyvek® breather membranes and guarantee long-term durability.

# DuPont™ AirGuard® Control

## Strong AVCL for optimal airtightness in roofs, walls and floors



## Outstanding Properties

- Air & vapour control layer (AVCL) with limited vapour transmission
- Airtight and water resistant
- DuPont™ Tyvar® spunbond & Ethylen-Butylacrylate Copolymer
- CE conformity for plastic and rubber vapour control layer (EN 13984)
- Superior mechanical strength
- Reaction to Fire: Class E
- Lightweight - easy to install
- Considerably reduces convective heat losses
- Considerably reduces risk of condensation into the insulation

## Reinforced airtightness of the building

Installing DuPont™ AirGuard® Control as part of the internal lining will minimize the rate of heat lost by convection through the construction. A continuous layer of DuPont™ AirGuard® Control will provide a barrier to air movement around the habitable space of the building.

DuPont™ AirGuard® Control has been specifically developed for use as an air leakage barrier, but will also contribute in controlling the passage of vapour through a structure. This will particularly apply to 'vapour-open' constructions where a vapour-open membrane is specified externally.

Combined with DuPont™ AirGuard® Control on the warm side, a diffusion-open DuPont™ Tyvek® membrane on the cold side of a timber frame construction is essential to avoid condensation risk.

### Specifications

Style name	8327AD
Roll size	1,50 m x 50 m, 9 kg
Mass per unit area	108 g / m <sup>2</sup>
Water vapour transmission value (s <sub>d</sub> )	2 m
Maximum tensile force MD/XD	200 / 170 N / 50 mm
Resistance to tearing MD/XD	240 / 240 N
Fire class	E
Temperature resistance	-40 / +80°C
Bendtsen airpermeability	0 ml / min

BBA certificate

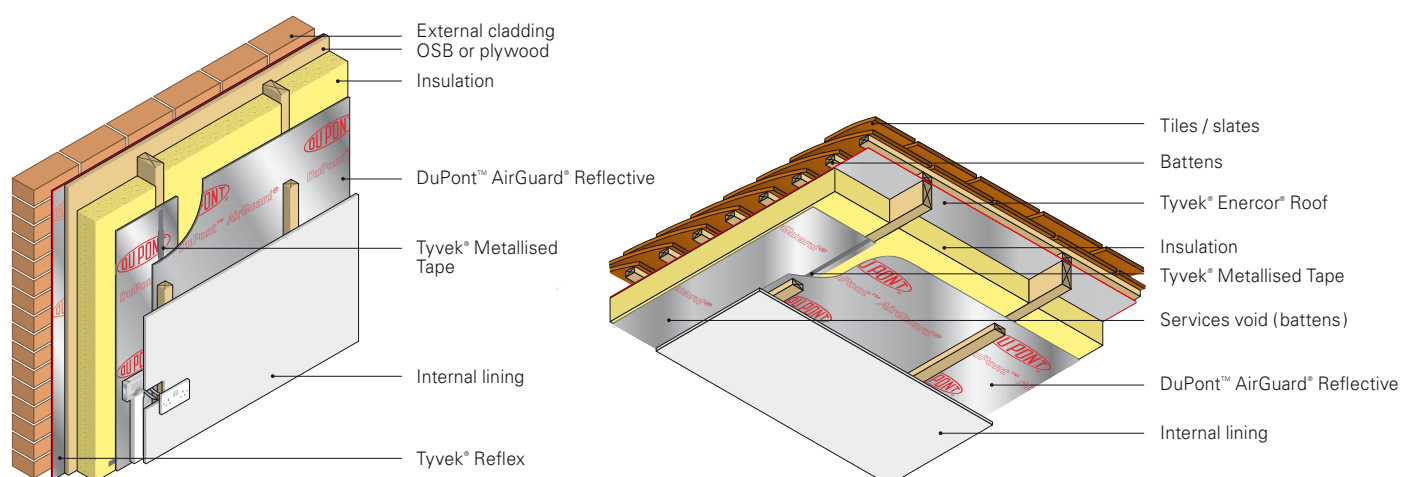
No 08/4548 and No 90/2548





# DuPont™ AirGuard® Reflective

## AVCL which boosts your thermal insulation



## Outstanding Properties

- Highly vapour resistant
- Airtight and water resistant
- A composite of polypropylene, polyethylene and an aluminium foil
- CE conformity for Plastic and rubber vapour control layer (EN 13984)
- Superior mechanical strength
- Reaction to Fire: Class E\*
- Reflects ca. 95% of radiant heat
- Considerably reduces risk of condensation into the insulation
- Considerably reduces convective heat losses

## Efficient thermal insulation

DuPont™ AirGuard® Reflective is a 100% air tight AVCL featuring a metallised surface with a very low emissivity, which combined with a non-ventilated airspace significantly boosts thermal insulation in a building.

With the combination of the metallised vapour-open membrane Tyvek® Enercor® Roof or Tyvek® Reflex, DuPont™ AirGuard® Reflective offers two main advantages:

- Thermal comfort - it provides protection against heat loss by radiation and convection.
- An efficient moisture management - it provides effective control against interstitial condensation both by diffusion and by convection.

### Specifications

Style name	5814X
Roll size	1,50 m x 50 m, 12 kg
Mass per unit area	149 g / m <sup>2</sup>
Water vapour transmission value (s <sub>d</sub> )	2000 m
Fire class	E*
Bendtsen airpermeability	0 ml / min
Temperature resistance	-40 / +80°C
Emissivity**	0,05

BBA certificate

No 08/4548 and No 90/2548

\* Installed on mineral wool.

\*\* A low emissivity value = high reflectivity = superior thermal performance.



# DuPont™ AirGuard® Reflective achieves an airtight seal of approval at a new Housing Association project in York



Considering the imperative – both social and regulatory – to improve the energy efficiency of buildings, it's no surprise that specifiers and developers are looking for forward-thinking, high-performance products that can help in achieving these goals. One of the crucial factors in convective thermal loss can be identified as air leakage, traditionally a common problem in UK construction. When the architect and the timber frame contractor for a new Housing Association development were aiming for ultra low heating consumption, an advanced material from DuPont offered the ideal solution for optimal structural air tightness.

DuPont™ AirGuard® Reflective is a metallised air & vapour control layer (AVCL) that is impermeable to both air and moisture while offering very low emissivity, thereby also playing a key role in preventing heat loss and reflecting up to 90% of internal radiant heat in the winter.



## The key to successful airtightness is the quality of both the membrane and the tapes...

“The scheme is fundamentally different from conventional British housing which has relied on central heating systems to create comfort, with insulation used merely to reduce fuel costs. These houses instead use high levels of air tightness and insulation to provide comfort,” says Phil Bixby of Constructive Individuals. “The Housing Association needed to be assured that the concept would work without complaints from tenants, and the concept does depend upon occupants correctly using the ventilation system, but after extensive research they were satisfied.”

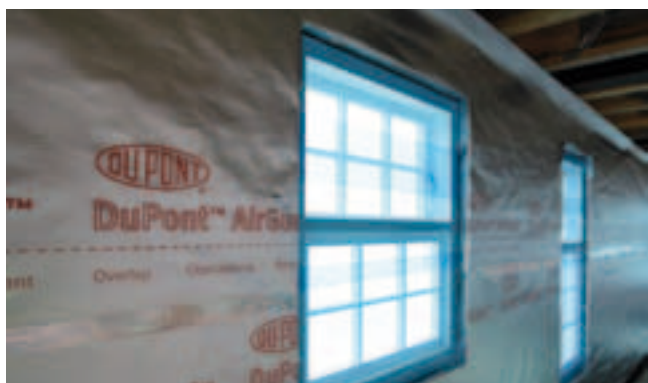
DuPont™ AirGuard® Reflective was installed to effectively line the inside of the structure in a continuous layer. Pressure tests on the completed plots have shown excellent results:

- Plot 1 (end terrace) – Air permeability 1.58 m³/h.m², Air leakage 1.51 h-1
- Plot 2 (mid terrace) – Air permeability 1.94 m³/h.m², Air leakage 1.86 h-1

Building Regulations Approved Document L sets a “reasonable limit for the Design Air Permeability” of 10m³/h.m² at 50 Pa. - and these figures are considerably below that maximum prescribed limit.

The key to successful airtightness is the quality of both the membrane and the tapes, together with the workmanship during installation. There are no doubts about the performance – and crucially – durability of the products. They are relatively easy and straightforward to apply and are very effective if installation is properly managed. Ultimately, however, energy savings are also dependent on the awareness and management of the end-user!

## Lethame House aims high with DuPont membranes



Lethame House is a new luxury housing project by Apex Developments Ltd in Strathaven, near Glasgow, that aims not only for very high standards of living but also of thermal efficiency. Consisting of four spacious timber-frame, stone-clad, slate-roofed units, the development features top quality materials, including three high-performance building membranes from DuPont - DuPont™ AirGuard® Reflective, Tyvek® Reflex and Tyvek® Supro.

Apex have worked to a superior specification from the outset, including the sourcing of local stone and slate, keen to create a distinctive development that will be a pleasure to inhabit for the long term. Exceeding the thermal and airtightness standards set by regulations has been a primary goal, and in order to achieve this, the project boasts a combination of advanced systems



and products. These include geo-thermal heat sources from 200 metre boreholes, a heat recovery system, DuPont™ AirGuard® Reflective AVCL on the internal walls, Tyvek® Reflex metallised breather membrane on the external walls and Tyvek® Supro breather membrane on the roof.

This combination of air-tight, light-weight, easy to install membranes is designed not only to protect the building envelope, but also to significantly enhance the thermal performance of the building, thereby improving interior comfort and reducing the carbon footprint.

# DuPont Accessories

## Create airtight, windtight and watertight seals

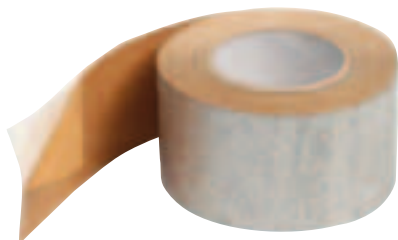
### Tyvek® Acrylic Tape



- Single-sided tape for sealing overlaps and making good around penetrations, pipes and windows. Recommended for all DuPont™ Tyvek® breather membranes and DuPont™ AirGuard® air & vapour control layers (AVCL's).
- Made of Tyvek® and acrylic adhesive for durable bonds.

Colour	White
Roll size	75 mm x 25 m
Rolls per box	6

### Tyvek® Metallised Tape



- Single-sided reflective tape for sealing laps in Tyvek® Enercor® Roof and Tyvek® Reflex and DuPont™ AirGuard® Reflective.
- Ideal for making good around penetrations, pipework, windows and doors.
- Made of metallised Tyvek® and acrylic adhesive.
- Provides durable bond.

Colour	Silver
Roll size	75 mm x 25 m
Rolls per box	6

### Tyvek® Double Sided Tape



- Double sided acrylic tape ideal for sealing overlaps and bonding Tyvek® membranes to smooth surfaces.
- Excellent adhesion properties under extreme humidity conditions.
- Strong initial tack.
- Recommended for Tyvek® UV Facade, but suitable for all Tyvek® membranes and DuPont™ AirGuard® AVCL products.

Colour	Transparent
Roll size	50 mm x 25 m
Rolls per box	10

# DuPont accessories

**Essential accessories for greater energy efficiency:** The energy efficiency of domestic and non-domestic buildings is to a great extent dependant on the continuity of materials used in the building envelope. With an ever increasing requirement to conserve energy the portfolio of DuPont™ Tyvek® products can help you achieve these environmental goals.

## Tyvek® Butyl Tape



- Double sided butyl based sealant, used to form a moisture and airtight seal between a Tyvek® membrane or DuPont™ AirGuard® AVCL and most commonly used building materials.
- The product is compatible with brickwork, blockwork, masonry, timber, metalwork and most plastic products.
- Tyvek® Butyl Tape is most effective when used under compression, eg. under a timber batten and is recommended for use at perimeters, chimneys, abutments and for sealing nail penetrations and around electrical sockets.

Colour	Black
Roll size	20 mm x 30 m / 50 mm x 30 m
Rolls per box	8 (20 mm x 30 m) / 4 (50 mm x 30 m)

## DuPont™ Universal Sealant



- Polyurethane (PU) sealant for all DuPont membrane overlaps, wood, PVC, concrete, brick/block and most plastics.
- Can be applied at low temperatures, suitable for internal or external use, resistant to water.
- Excellent aging and outdoor performance.

Colour	Grey
Cartridge size	310 ml
Cartridges per box	12

## DuPont™ FlexWrap NF



- High performance stretchable and flexible self adhesive flashing tape.
- Considerably helps to facilitate the creation of airtight and water tight seals around windows, door sills, chimney breasts, pipe penetrations and any custom shapes.
- Designed to ensure continuity, compatibility and integrity with all Tyvek® breather membranes and DuPont™ AirGuard® AVCL's, as well as PP non-wovens and laminated membranes at penetrations.

Colour	Black / White
Roll size	150 mm x 22.9 m
Rolls per box	1

# DuPont™ Tyvek® and DuPont™ AirGuard® Application Table

## Make the right choice

Applications	Tyvek® Acrylic Tape	Tyvek® Metallised Tape	Tyvek® Double Sided Tape	Tyvek® Butyl Tape	DuPont™ Universal Sealant	DuPont™ FlexWrap NF
<b>DuPont™ Tyvek® roofing underlays</b>						
Tyvek® Supro / Plus	✓		✓	✓	✓	✓
Tyvek® Metal	✓		✓	✓	✓	✓
Tyvek® Enercor® Roof		✓	✓	✓	✓	✓
<b>DuPont™ Tyvek® solutions for Timber Frame and wall constructions</b>						
Tyvek® Housewrap	✓		✓	✓	✓	✓
Tyvek® UV Facade			✓	✓	✓	
Tyvek® Reflex		✓	✓	✓	✓	✓
<b>DuPont™ AirGuard® air &amp; vapour control layer (AVCL)</b>						
DuPont™ AirGuard® Control	✓		✓	✓		✓
DuPont™ AirGuard® Reflective		✓	✓	✓	✓	✓
<b>Materials</b>						
Masonry / concrete / render (smooth)	✓	✓	✓	✓	✓	✓
Brick / block / concrete (rough)				✓	✓	✓
Plasterboard	✓	✓	✓	✓	✓	
Eaves Carrier			✓	✓	✓	✓
Window / door frames	✓	✓	✓	✓	✓	✓
Metal surface	✓	✓	✓	✓	✓	✓
Timber (rough sawn)				✓	✓	✓
Timber (planed)	✓	✓	✓	✓	✓	✓
<b>Details</b>						
Pipe penetrations (plastic)	✓	✓				✓
Pipe penetrations (metal)	✓	✓				✓
Wiring / cable penetrations	✓	✓				✓
Chimneys				✓	✓	✓
Chimneys (making good corners)	✓	✓				✓
Around electrical sockets	✓		✓	✓	✓	
<b>Other</b>						
Damage repair	✓	✓				
Nail penetration*				✓		
Laps sealing	✓	✓	✓		✓	

\* Under batten

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All DuPont™ Tyvek® membranes and DuPont™ AirGuard® AVCL's have undergone extensive testing for the purposes of CE certification.



*The miracles of science™*