

DuPont™ Climate Systems

INNOVATIONS IN HOME COMFORT

Providing interior comfort by boosting insulation to save energy and manage moisture.



The miracles of science™



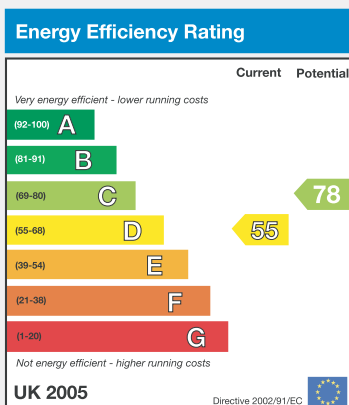
DuPont™ Climate Systems - helping to meet building regulation requirements & offer energy savings of up to 15%

The buildings sector accounts for an incredible 40% of the EU's energy consumption. Driven by the Kyoto agreement and the need to secure energy supply the EU introduced the EPBD* (2002/91/EC) to increase the energy efficiency of newly constructed homes by over 20% by 2010.

In response to this need for better, smarter building materials, DuPont has created DuPont™ Climate Systems: a holistic solution that enables architects, builders and roofers to take a giant leap towards meeting the demands for energy efficient construction – with a saving of up to 15% when building with DuPont™ Climate Systems.

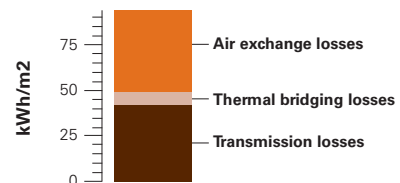
*EPBD - Energy Performance of Buildings Directive

“Supports the EPBD– Energy Performance of Buildings Directive.”



Sellers or owners of buildings for rent will need to provide prospective buyers with an Energy Efficiency certificate to enable them to make informed decisions.

Typical example of energy loss



The unique properties of the innovative metallised membranes used in DuPont™ Climate Systems will considerably decrease the two main sources of heat loss of a building without increasing the building footprint.

Unique energy-saving solution for the entire building

Combining comfort with protection & energy-savings

All-in-one membrane insulation solutions

DuPont™ Climate Systems has been created using low emissivity membrane technologies, which reduce radiant heat transfer and effectively manage moisture levels. The result is an internal climate that maintains comfort levels all year round, ensuring a dry, warm and draught-free environment: no longer at the mercy of the seasons or the elements.

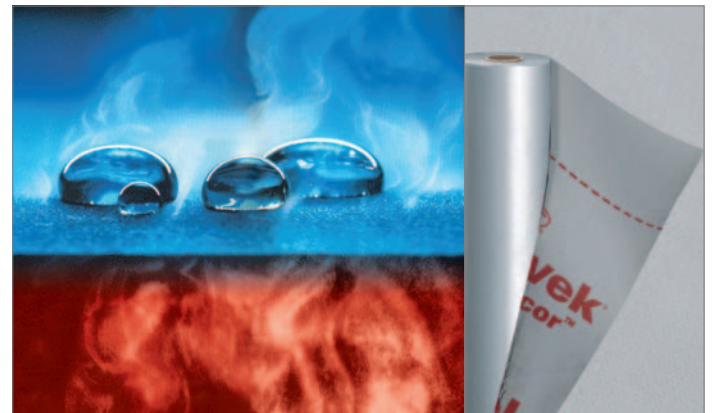
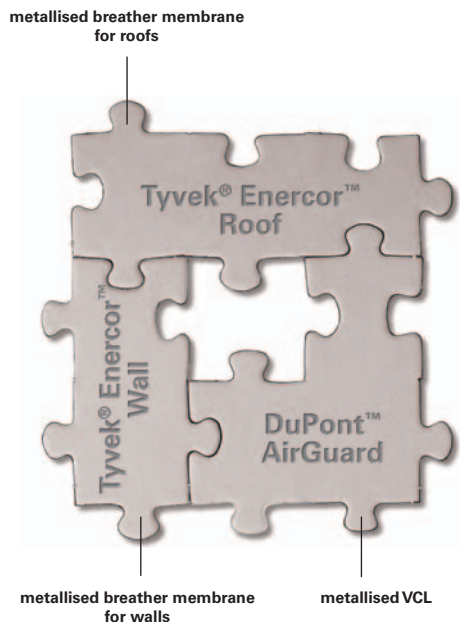
A complementary system of new components

The component products work together as a complete system, providing a building envelope membrane solution that covers an entire house, is wind and watertight, boosting existing insulation, making the building airtight, whilst enabling the building envelope to fully 'breathe'. Incorporating the newly developed Tyvek® Enercor® Roof, Tyvek® Enercor® Wall, and DuPont™ AirGuard®, the system represents a breakthrough in home climate performance.

Boosting insulation performance and retaining/reflecting heat

A key innovation is the metallised surface of Tyvek® Enercor® Roof and Tyvek® Enercor® Wall. This is placed on the cold side of traditional insulation with innovative reflective VCL, DuPont™ AirGuard®, on the warm side. Consequently:

- The metallised surface improves insulation performance of the air layer between DuPont™ Tyvek® Enercor® and the insulating material by 200-300%.
- The insulation material performance is vastly improved by prohibiting air infiltration.
- The low emissivity of the system reflects heat back inside the building during winter and keeps the building cool during the summer: 85% of the heat radiated by the sun is blocked!
- Dirt cannot build up on the metallised surface of Tyvek® Enercor® Roof due to its unique 'face-down' installation method.

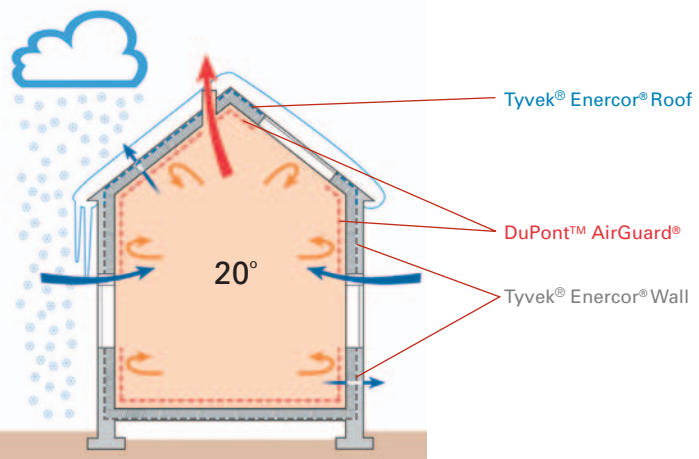
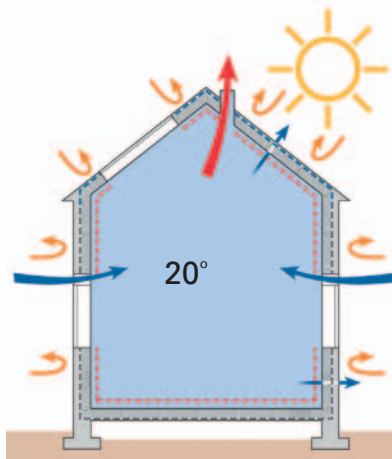


Tyvek® Enercor® is reflective yet still vapour open, because the Tyvek® micro-fibre structure is made with DuPont's unique flash-spinning technology, and each fibre is coated with a thin layer of aluminum to ensure long lasting performance.

Touching every aspect of a home



**“Air tight, vapour open
and reflective -
the ideal combination
of properties.”**



“Build tight, ventilate right” with the perfect combination of complementary products

Tyvek® Enercor® Roof

Tyvek® Enercor® Roof is a vapour open roof underlay with a metallised low emissivity surface, which blocks radiant heat in summer and reduces radiated heat loss in winter.

Tyvek® Enercor® Wall

Tyvek® Enercor® Wall is a vapour open wall membrane with a metallised low emissivity surface, which reflects radiant heat in summer and reduces radiated heat loss in winter.

DuPont™ AirGuard®

DuPont™ AirGuard® is a 100% air tight vapour control layer featuring a metallised surface with a very low emissivity, which significantly boosts thermal insulation in a building.

Tyvek® Metallised Tape and Tyvek® Butyl Tape

These tapes are used to seal the laps of the various products and to fix them to timber, masonry and any other building surface. Together they help make a building envelope completely air tight.

, benefiting lifestyle, economy and environment

Driving home the benefits: a system that works on many fronts

Through building airtight, DuPont™ Climate Systems help to reduce heat transfer, unwanted air leakage and the loss of energy. But the overall impact is greater than just the home environment. Not only do DuPont™ Climate Systems work for an individual house, they also have a global benefit too, helping the environment by reducing CO₂ emissions.

Boosting existing insulation to make it work harder

Improved insulation performance is the key to creating a comfortable and efficient home:

- The low emissivity of Tyvek® Enercor® cuts down heat flow through walls and roofs, helping to reduce radiant heat losses and lower heating costs.
- DuPont™ AirGuard® boosts the thermal insulation performance in the winter by reflecting 90% of the radiant heat back into the home.

Regulating temperatures to optimise comfort levels

DuPont™ Climate Systems control temperatures with low emissivity metallised surfaces providing constant thermal comfort all year round:

- Tyvek® Enercor™ reflects up to 85% of radiation in winter and in summer
- DuPont™ AirGuard® prevents uncontrolled air filtration through the building.

**“More comfort
for less cost, less
energy use and less
environmental impact.”**

Taking the moisture out of the home environment

Moisture from condensation and evaporation plays a major role in destabilising indoor climates:

- DuPont™ Climate Systems reduce the risk of interstitial condensation and allow harmful moisture to pass through the structure to the outside.
- Timber structures are protected by preventing mould and mildew from attacking timber components.

Protecting the environment by helping to reduce CO₂ emissions

The diffusion, wind and waterproof membranes systems improve a building's insulation and make it easier to save energy:

- The system helps to work towards achieving Kyoto target levels on carbon emissions:
- Meets EU directive EU 2002/91/CE, and helps you meet Energy Pass regulations.



A flexible solution: versatile system

DuPont™ Climate Systems, the right combination of low emissivity membranes

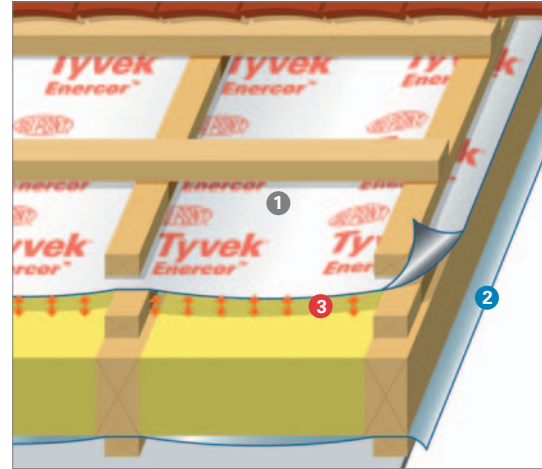
- Long lasting performance due to innovative installation method (dirt cannot build up on metallised surface)
- Effective R-value of air cavity with Tyvek® Enercor® Roof = 0.40 m² K/W*
- Effective R-value of air cavity with DuPont™ AirGuard® = 0.46 m² K/W*

* combined with air cavity

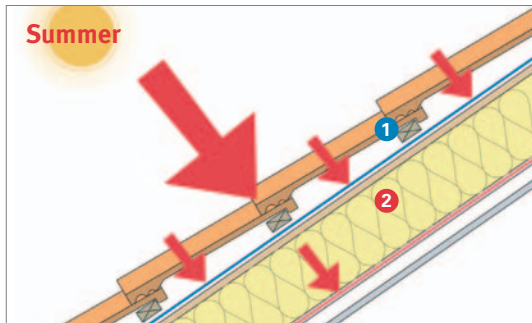
1) Outside: Tyvek® Enercor® Roof is installed with the metallised surface facing into the building.

2) Inside: DuPont™ AirGuard® is installed with the metallised surface facing the building interior.

3) 25 mm non-ventilated air cavity



Roof application design: how it works



1) The metallised surface of Tyvek® Enercor® Roof blocks the heat radiated by the sun, helping to reduce radiant heat gains.

2) DuPont™ AirGuard® is preventing uncontrolled air leakages into the building envelope. The very low emissivity of DuPont™ AirGuard® is an effective radiant barrier to complement the performance of the thermal insulation.



1) The metallised surface of Tyvek® Enercor® Roof is reflecting the heat radiated by the insulation. It has a high vapour permeability to avoid the risk of condensation, and is rain and wind tight to protect the insulation.

2) DuPont™ AirGuard® is preventing uncontrolled air infiltration through the building fabric. The high reflectivity of DuPont™ AirGuard® is an effective radiant barrier to complement the performance of the thermal insulation.

In winter, Tyvek® Enercor® and DuPont™ AirGuard® bo

Systems for different building envelopes

DuPont™ Climate Systems, the right combination of low emissivity membranes

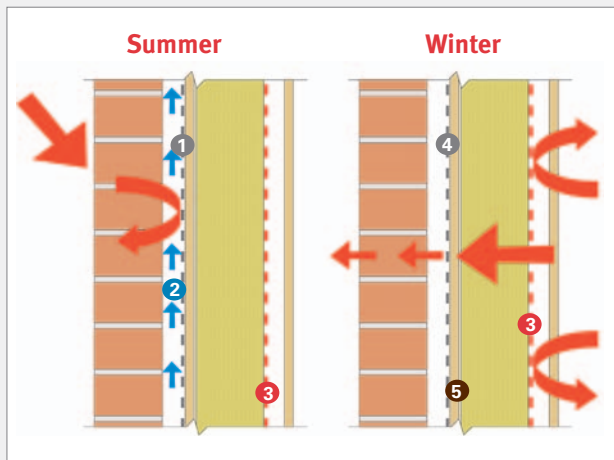
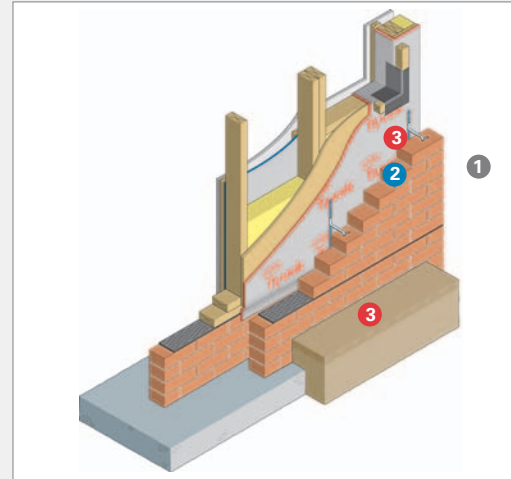
- Effective R-value of air cavity with Tyvek® Enercor® Wall = 0.52 m² K/W*
- Effective R-value of air cavity with DuPont™ AirGuard® = 0.68 m² K/W*

* combined with air cavity

1) Outside: Tyvek® Enercor® Wall is installed with the metallised surface facing outwards into the cavity.

2) Inside: DuPont™ AirGuard® is installed with the metallised surface facing the building interior.

3) 25 mm non-ventilated air cavity



Wall application design: how it works

- 1) The metallised surface of Tyvek® Enercor® Wall reflects radiant heat away from the wall, helping to reduce radiant heat gains.**
- 2) Water vapour from moisture migrating through the cladding is carried away within the semi-ventilated cavity.**
- 3) DuPont™ AirGuard® is**
 - reflecting more than 90% of the radiant heat in winter.
 - preventing uncontrolled air filtration through the building fabric.
 - controlling the amount of moisture.
 - preventing moisture to enter the building envelope from inside.
- 4) The low-emissivity surface of Tyvek® Enercor® cuts down heat flow through the wall, helping to reduce radiant heat losses and lower heating costs.**
- 5) Increased R-value of wall system raises sheathing temperature, reducing the likelihood of internal vapour condensing on the backside of the wall sheathing.**

Boost the insulation material performance by up to 20%.

To find out what DuPont™ Climate Systems can do to your application and how to meet Part L and the Code for Sustainable Buildings, visit:

www.construction.tyvek.com

Putting DuPont™ Climate Systems to the test in real case scenarios

DuPont™ Climate Systems total solution: For walls & roofs

DuPont has tested DuPont™ Climate Systems in real buildings. Below are the conditions and results of one such test, which clearly indicates a minimum decrease of 15% energy loss (transmission loss).

	Without DCS™	With DCS™	Improvement
Transmission loss [KWH/m2.a]	134	114	15%
Air leakage loss [KWH/m2.a]	159	119	25%
Total loss [KWH/m2.a]	293	233	20%
Volume of fuel (liter)	4108	3266	
Cost benefit [Euro/a]		589	

Before: a newly constructed timber frame building had double glazed windows, 100 mm insulation in a ventilated warm roof without VCL and gypsum board, and a 100 mm stud wall. The following improvements were made with DuPont™ Climate Systems' product range:

Roof: Underlay was replaced with Tyvek® Enercor® Roof and DuPont™ AirGuard®, together with Gypsum board. (to improve the U value and level of air tightness).

Walls: Standard breather membrane was replaced with Tyvek® Enercor® Wall and DuPont™ AirGuard® together with Gypsum board (to improve the U value and level of air tightness).

DuPont can provide specific energy-saving calculations, based on the design of a project and the DuPont™ Climate Systems' products required to cover the building.

BBA Certificates for Tyvek® Enercor® Roof, Tyvek® Enercor® Wall and DuPont™ AirGuard® pending.

Recommendations as to methods, use of materials and construction details are based on the experience and current knowledge of DuPont and are given in good faith as a general guide to designers, contractors and manufacturers. This information is not intended to substitute for any testings you may need to conduct to determine for yourself the suitability of our products for your particular purposes. This information may be subject to revision as new knowledge and experience becomes available since we cannot anticipate all variations in actual end-use conditions. DuPont makes no warranties and assumes no liability in connection with any use of this information. Nothing in this publication is to be considered as a licence to operate under a recommendation to infringe any patent right.

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