

The logo for 'protect' is displayed in a bold, dark blue, lowercase sans-serif font. A horizontal blue line is positioned directly beneath the letters 't' and 'e'.The background of the page features several sheets of white construction membranes. One sheet in the upper left corner has 'protect' and 'TF200 Thermal' printed in blue. A central sheet has 'protect' and 'Foil Ultra' printed in red. A lower sheet has 'protect' and 'INTERFOIL' printed in red. To the right, there are two black plastic profiles: one is a long, thin strip with a channel, and the other is a wider, more complex profile. Below these is a white, textured mat with a grid of small, raised rectangular cells.

REFLECTIVE TECHNOLOGY CONSTRUCTION MEMBRANES



REFLECTIVE TECHNOLOGY MEMBRANES

As fabric energy efficiency is becoming increasingly legislated by Building Regulations and Standards, the benefits of lower energy consumption and therefore costs to the building occupier are easy to understand.

However, the modern builder needs to find ways to construct the dwelling to meet these standards whilst ensuring that the property remains affordable to potential buyers.

Building Regulations and Standards set upper limit U-values for construction elements, but in order to meet the more onerous fabric energy efficiency targets, a Notional Dwelling specification has been developed which is much more demanding - typical values can be seen below.

Element or system	Upper limit value	Notional Dwelling specification value	Improvement required
Roof	0.20W/m ² K	0.13W/m ² K	35%
Walls	0.30W/m ² K	0.18W/m ² K	40%
Floors	0.25W/m ² K	0.13W/m ² K	48%
Airtightness	10m ³ /hr/m ²	5m ³ /hr/m ²	50%

Low emissivity technology

The Protect range of Reflective Technology construction membranes utilises high purity aluminium foil to provide low emissivity, radiant barriers. When installed facing into an unventilated airspace (as defined in BS EN ISO 6946), they effectively block infra-red radiation and enhance the thermal performance of the airspace. This, in turn, improves the overall thermal resistance of the wall construction. This provides design flexibility and cost savings when achieving these more onerous U-value targets.

Emissivity of Protect's reflective surfaces has been tested in accordance with BS EN 15976 and thermal resistance performance in a wall construction has been tested in accordance with BS EN ISO 8990.

Applications

In order to meet the onerous fabric energy efficiency targets, a timber frame wall needs to combine thermal efficiency with a flexible airtightness solution to ensure long-term compliance whilst minimising the energy costs to the eventual building occupier. In addition, the wall panel must also effectively minimise the risk of harmful condensation. Timber frame construction requires both a breathable membrane on the outer sheathing or cold side of the panel, which also provides temporary protection against the elements, and an air and vapour control layer (AVCL) on the internal or warm side of the panel.

As improved airtightness has become more crucial to modern, energy efficient construction, it is now common practice to include a batten between the AVCL membrane and the internal lining board to create a circa 25mm deep void to route services without having to puncture the AVCL membrane, thus maintaining its integrity.

Switching from traditional vapour control membranes to Protect VC Foil Ultra insulating AVCL membrane will provide both airtightness and vapour control. With the low emissivity foil faced surface facing into the service void airspace, the wall structure will benefit from additional thermal performance.



Replacing a standard Protect TF200 breather membrane on the outer sheathing boards with Protect TF200 Thermo

insulating breather membrane will ensure that the wall structure will benefit from additional thermal performance when the low emissivity foil faced surface faces into the drainage cavity. Using Protect TF200 Thermo will provide protection to the panel during the construction process and will also allow the panel to dry out once the external cladding is completed.

The innovative Protect TF InterFoil insulating breather membrane can be installed either on the cold side of the panel, on the inside face of the sheathing board, or on the warm side of the panel

behind the vapour control layer. In all instances, the insulation is held in position within the studs to facilitate the 20mm airspace by a Protect Cavit-E Tray for mineral wool slab insulants (see table 3 image). Innovative, rigid EPS insulants such as Jablite JTWS-TF have integral ribs on both sides to maintain the 20mm airspaces, removing the need for the Cavit-E Trays (see table 4 image).

The tables below show typical U-value results when combining the Protect range of Reflective Technology construction membranes with differing lambda insulants.

The U-value results have been determined as follows:

Bridging:

A thermal bridge percentage for the timber studs of 12.5% has been used in accordance with BR 443:2006 Conventions for U-values (section 4.5.1 (ii)).

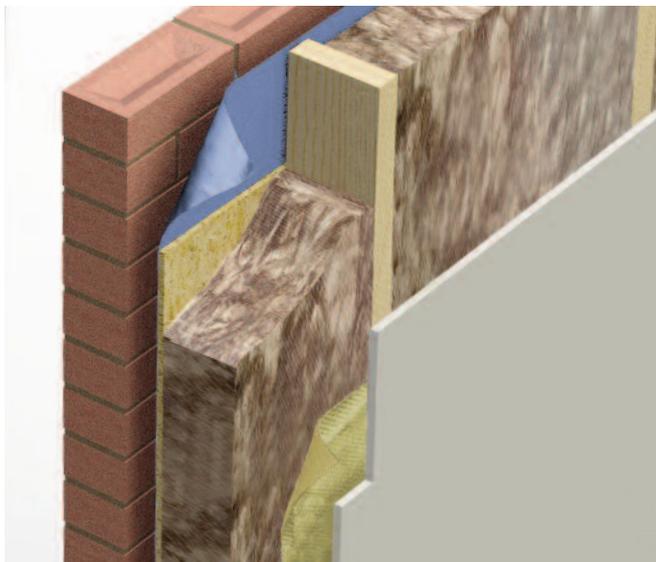
Correction level:

A correction level of 0 has been used in accordance with Table F1 of BS EN ISO 6946:2017 Building components and building elements - Thermal transmittance - Calculation methods.

U-value performance tables

Table 1

Timber frame construction with Protect TF200 standard breather membrane



(Showing mineral wool insulation)

Description	Thickness mm	Insulation lambda value	
		0.032	0.035
140mm stud in timber frame		0.032	0.035
Rsi	-	0.130	0.130
Plaster skim	3.0	0.017	0.017
Plasterboard	12.5	0.066	0.066
Air and vapour control layer	-		
Timber frame (insulation between studs)	140.0	4.375	4.000
OSB sheathing	9.0	0.073	0.073
Protect TF200			
Unventilated air cavity	50.0	0.180	0.180
Brick outer leaf	102.5	0.133	0.133
Rse	-	0.040	0.040
Total	317.0	4.102	3.877
U-value W/m²K (rounded)		0.25	0.26

Table 2

Timber frame construction with Protect TF200 Thermo insulating breather membrane and Protect VC Foil Ultra insulating AVCL membrane

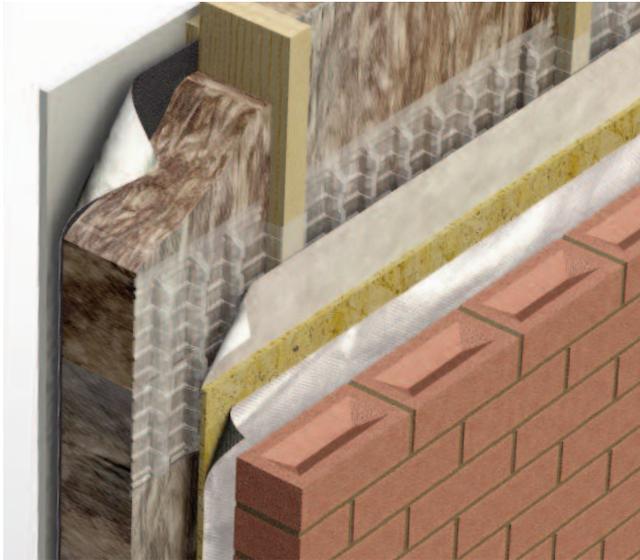


(Showing mineral wool insulation)

Description	Thickness mm	Insulation lambda value	
		0.032	0.035
140mm stud in timber frame		0.032	0.035
Rsi	-	0.130	0.130
Plaster skim	3.0	0.017	0.017
Plasterboard	12.5	0.066	0.066
Low emissivity service cavity	25.0	0.780	0.780
Protect VC Foil Ultra			
Timber frame (insulation between studs)	140.0	4.375	4.000
OSB sheathing	9.0	0.073	0.073
Protect TF200 Thermo			
Unventilated air cavity	50.0	0.770	0.770
Brick outer leaf	102.5	0.133	0.133
Rse	-	0.040	0.040
Total	342.0	5.590	5.329
U-value W/m²K (rounded)		0.19	0.20



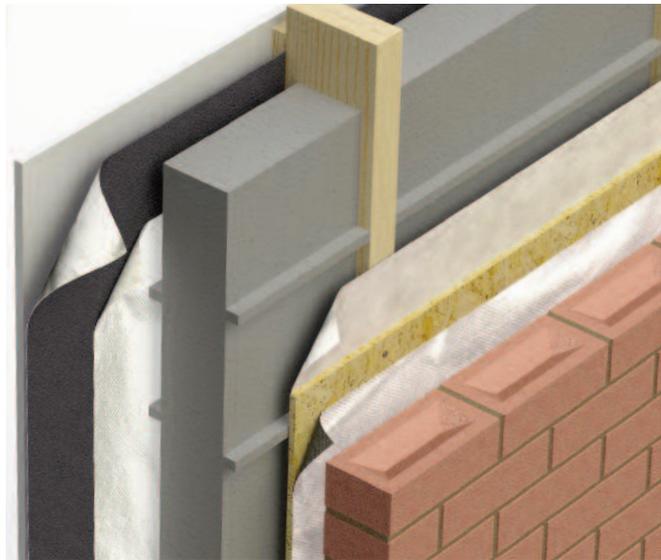
Table 3
Timber frame construction with Protect TF200 Thermo, Protect VC Foil Ultra and a single layer of Protect TF InterFoil low emissivity membrane



(Showing mineral wool insulation and Cavit-E Tray)

Description	Thickness mm	Insulation lambda value	
		Thermal resistance values	
140mm stud in timber frame		0.032	0.035
Rsi	-	0.130	0.130
Plaster skim	3.0	0.017	0.017
Plasterboard	12.5	0.066	0.066
Low emissivity service cavity	25.0	0.780	0.780
Protect VC Foil Ultra			
Timber frame (insulation between studs)	120.0	3.750	3.429
Unventilated air cavity/Cavity-E Tray 20.0		0.770	0.770
Protect TF InterFoil			
OSB sheathing	9.0	0.073	0.073
Protect TF200 Thermo			
Unventilated air cavity	50.0	0.770	0.770
Brick outer leaf	102.5	0.133	0.133
Rse	-	0.040	0.040
Total	342.0	5.689	5.468
U-value W/m²K (rounded)		0.18	0.19

Table 4
Timber frame construction with Protect TF200 Thermo, Protect VC Foil Ultra and two layers of Protect TF InterFoil low emissivity membrane



(Showing Jablite JTWS-TF insulation with integral ribs)

Description	Thickness mm	Insulation lambda value	
		Thermal resistance values	
140mm stud in timber frame		0.032	0.035
Rsi	-	0.130	0.130
Plaster skim	3.0	0.017	0.017
Plasterboard	12.5	0.066	0.066
Low emissivity service cavity	25.0	0.780	0.780
Protect VC Foil Ultra			
Unventilated air cavity	20.0	0.770	0.770
Timber frame (insulation between studs)	100.0	3.125	2.857
Unventilated air cavity	20.0	0.770	0.770
Protect TF InterFoil			
OSB sheathing	9.0	0.073	0.073
Protect TF200 Thermo			
Unventilated air cavity	50.0	0.770	0.770
Brick outer leaf	102.5	0.133	0.133
Rse	-	0.040	0.040
Total	342.0	5.787	5.079
U-value W/m²K (rounded)		0.18	0.19

THE REFLECTIVE TECHNOLOGY PRODUCT RANGE

Protect TF200 Thermo

A high performance, highly reflective, low emissivity insulating breather membrane which combines high tear strength with weather resistance and vapour permeability.

Available in the following roll sizes:
0.3m x 100m, 0.6m x 100m,
1.5m x 50m, 2.7m x 100m
and 3.0m x 100m.



Protect TF InterFoil

An innovative, highly reflective, low emissivity insulating breather membrane which has been designed specifically for use within a timber frame wall panel on either or both sides of the insulation to enhance thermal performance.

Available in the following roll sizes:
1.2m x 100m and 2.4m x 100m.



Protect VC Foil Ultra

A robust and highly reflective, low emissivity insulating air and vapour control layer which has been developed to enhance the thermal performance of walls, ceilings and floors.

Available in the following roll sizes:
1.35m x 50m, 1.5m x 50m
(both sizes with and without
integral lap and sealing tapes),
2.7m x 50m, 2.7m x 100m
and 3.0m x 50m.



Protect Cavit-E Tray

A purpose designed, translucent insulation spacer / support tray to create a circa 20mm air cavity within the depth of the wall stud, used in conjunction with Protect TF InterFoil, Protect VC Foil Ultra and mineral wool slab insulants.

Available in boxes of 50 to suit 600mm stud centres but can be cut on site to suit other sizes.



Protect Cavit-E Clip

Specifically designed for use with Protect VC Foil Ultra. The clips are fixed over studs or rafters holding the reflective membrane in place to create a 25mm airspace.

Available in 2.2m lengths but can be cut on site into smaller lengths.



PROTECT LAP AND SEAL TAPE RANGE

The Protect Lap and Seal tape range has been developed to complement the Protect range of construction membranes to help reduce uncontrolled air leakage in all forms of building construction.

Reveal Tape

Single-sided high-tack, extremely durable woven reinforced reflective tape, ideal for dressing into awkward details without tearing. Performs the airtightness function between the internal AVCL and the external cladding or membrane in and around doors and window reveals.

Available in the following roll sizes:
50mm x 50m, 75mm x 50m, 150mm x 20m, 200mm x 50m and 300mm x 50m.



Reflective Reinforced Tape

Designed for sealing overlaps of timber frame membranes, air barriers and vapour control layers and for sealing around service penetrations. Can be used for internal or external applications.

Available in the following roll size:
50mm x 50m.



RELATED PRODUCTS

For airtightness applications, Protect offers **BarriAir**, a high performance and multi-purpose, coated non-woven membrane with integrated lap and sealing tapes which forms a highly effective air leakage barrier with vapour control qualities.

The Protect **FCM750 Floor Cassette Membrane** is a high performance, airtight yet vapour permeable membrane which maintains the integrity of airtightness at intermediate floor junctions without the risk of interstitial condensation.

Protect's **Party Wall Air Barrier (PWAB) membrane** in conjunction with Protect Tapes and full-fill insulation enables airtightness and the Notional Dwelling target value to be met in accordance with Building Regulations.

Stockist's stamp



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Protect Membranes maintains a policy of continuous development and reserves the right to amend product specifications without notice.



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