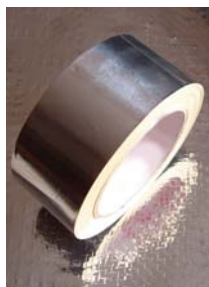


# VC FOIL INSULATING VAPOUR CONTROL LAYER



## VC FOIL INSULATING VAPOUR CONTROL LAYER



Protect VC Foil is a robust highly reflective low emissivity vapour control layer which has been developed to enhance the thermal performance of walls, ceilings and floors. It provides significant thermal, strength and performance enhancements over conventional vapour control layer materials with the added benefit of a service cavity.

- Excellent vapour resistance
- Helps to avoid condensation risk in accordance with BS 5250: 2002
- Reduces air leakage when used with Protect VC Foil sealing tape as required by Building Regulations
- Low emissivity reflective surface enhances the thermal performance of the structure into which it is incorporated
- Corrosion and damage resistant reflective surface
- Excellent nail tear resistance
- High burst strength, tough and durable
- Easy to cut and lightweight to handle
- Foil faced moisture resistant tape to ensure correct sealing and air tightness
- Fully BRE certified for all applications



### Composition

Protect VC Foil is a triple ply construction including a tough polywoven core layer with a bright high purity aluminium foil which is pressure bonded with a further polypropylene interlayer.

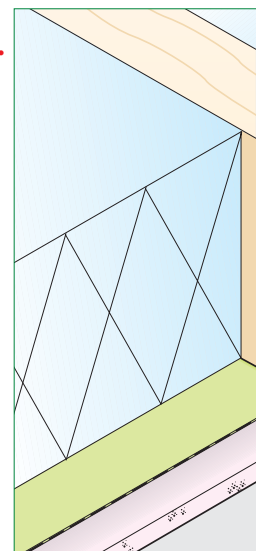
### Size

Roll sizes 1.5m x 50m (75m<sup>2</sup>) and 3m x 50m (150m<sup>2</sup>), branded as Protect VC Foil. Protect VC Foil sealing tape 50m x 50mm.

### Protect VC low emissivity technology

Protect VC Foil provides a highly reflective, low emissivity layer. When installed facing into an unventilated airspace, this effectively blocks infra red radiation and enhances the thermal performance of the airspace, and hence the overall U-value of the construction. Normal high emissivity airspaces are compared with low 'e' airspaces in the table below.

Thermal resistance is calculated to BS EN IOS 6946: 1997 'Thermal resistance and thermal transmittance - calculation method'.

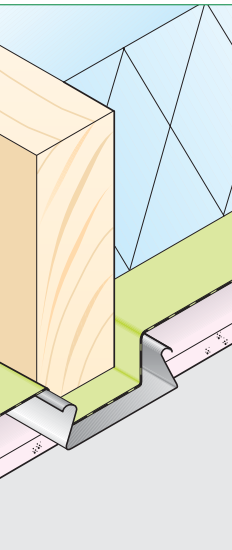


### Improvement in thermal resistance values using Protect VC Foil

|                      | Airspace (mm) | Unventilated airspace:                    |   | Improvement with Protect VC Foil |
|----------------------|---------------|---|---|----------------------------------|
|                      |               | No special treatment (m <sup>2</sup> K/W) | Protect VC Foil facing into airspace (m <sup>2</sup> K/W) |                                  |
| <b>Wall</b>          | 15            | 0.17                                      | 0.52  | 205%                             |
| heat flow horizontal | >20           | 0.18                                      | 0.78  | 333%                             |
| <b>Roof/ceiling</b>  | 10            | 0.15                                      | 0.36  | 140%                             |
| heat flow upwards    | >13           | 0.16                                      | 0.53  | 233%                             |
| <b>Floor</b>         | 25            | 0.19                                      | 0.80  | 321%                             |
| heat flow downwards  | 50            | 0.21                                      | 1.33  | 533%                             |

### Performance

|   | MD (along roll) | CD (across roll) |
|---|-----------------|------------------|
| Nail Tear Strength (N) to EN 12310-1 with mods    | 620             | 594              |
| Tensile Strength (N/50mm) to EN 12311-1 with mods | 629             | 559              |
| Elongation (%) to EN 12311-1 with mods            | 20              | 20               |
| Water vapour resistance (MNs/g) to EN 1931        |                 | >589             |
| Surface emissivity to SABS 1381-4: 1985           |                 | 0.05             |



## Cavit-E clip

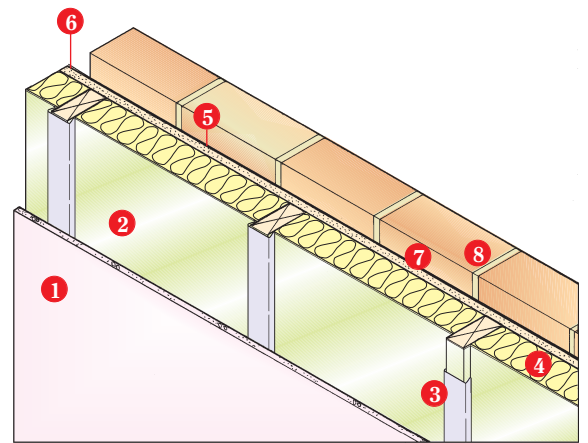
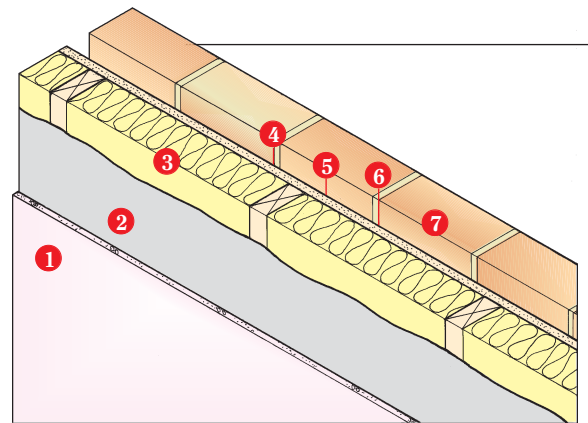
The Cavit-E clip has been designed specifically for use with Protect VC Foil to enhance thermal performance of timber frame walls and warm roofs.

It simply clips over the studs or rafters, holding the Protect VC Foil in place and creating a minimum 20mm unventilated airspace. This improves the thermal performance without increasing the stud/rafter size or the overall thickness of the construction.

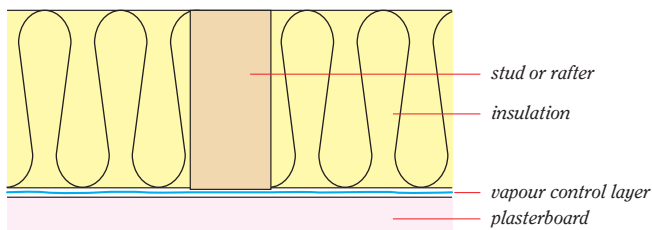
It has the added benefit of creating a cavity for services on the warm side of the insulation without compromising the integrity of the vapour control layer.

The Cavit-E clip is a sprung plastic section which fits a range of stud or rafter widths and is supplied in 2.5m lengths.

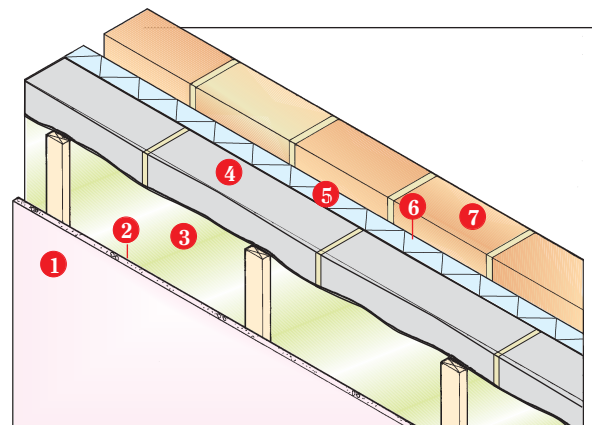
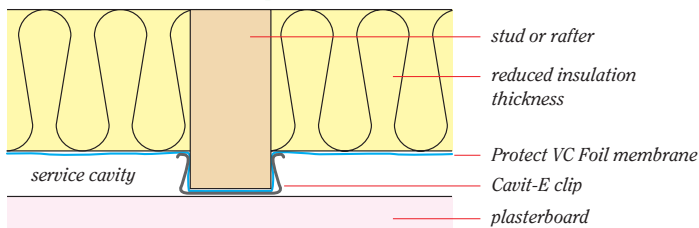
- Enhanced thermal performance (U-value) - see comparison following.
- Improved air tightness, limiting heat loss.
- Can reduce air leakage by 60% for SAP calculation purposes.
- Maximises internal floor areas.
- Reduced installation costs.
- Can be used with all insulation types but ideally suited for flexible fibrous and blown insulation.
- Quick and easy to install.
- Eliminates the need for stapling the vapour control layer.
- Maintains the integrity of the vapour control layer and creates a low emissivity cavity and service void.



## Standard



## Enhanced with Cavit-E clip and Protect VC Foil



## Timber frame wall construction

### Standard U-value 0.30 W/m<sup>2</sup>K

| Layer                                    | Thickness<br>(mm) | Thermal conductivity<br>$\lambda$ (W/mK) |        | Bridging<br>fraction | Thermal resistance<br>R (m <sup>2</sup> K/W) |                         |
|--|-------------------|--|--------|----------------------|--|-------------------------|
|  |                   | layer                                    | bridge |                      | layer  | bridge                  |
| Surface resistance, internal             |                   |  |        |                      | 0.130  |                         |
| <b>1</b> Plasterboard                    | 12.5              | 0.210                                    |        |                      | 0.060  |                         |
| <b>2</b> Vapour control layer            |                   |  |        |                      | -  |                         |
| <b>3</b> Insulation batt/timber frame    | 140               | 0.040                                    | 0.120  | 0.150                | 3.500  | 1.167                   |
| <b>4</b> OSB sheathing                   | 9                 | 0.130                                    |        |                      | 0.069  |                         |
| <b>5</b> Protect TF200 breather membrane |                   |  |        |                      | -  |                         |
| <b>6</b> Cavity unventilated             | 50                |  |        |                      | 0.180  |                         |
| <b>7</b> Brick outer leaf                | 102.5             | 0.770                                    |        |                      | 0.133  |                         |
| Surface resistance, external             |                   |  |        |                      | 0.040  |                         |
| <i>Total wall thickness</i>              | 314mm             |  |        |                      | <i>Total resistance</i>                      | 4.112m <sup>2</sup> K/W |

### Enhanced U value 0.25 W/m<sup>2</sup>K

#### Incorporates Protect Cavit-E clip and reflective technology

Compared with standard construction this has an improved U-value with thinner insulation and the same overall wall thickness.

| Layer   | Thickness<br>(mm) | Thermal conductivity<br>$\lambda$ (W/mK) |        | Bridging<br>fraction | Thermal resistance<br>R (m <sup>2</sup> K/W) |                         |
|---|-------------------|--|--------|----------------------|--|-------------------------|
|   |                   | layer                                    | bridge |                      | layer  | bridge                  |
| Surface resistance, internal                        |                   |  |        |                      | 0.130  |                         |
| <b>1</b> Plasterboard                               | 12.5              | 0.210                                    |        |                      | 0.060  |                         |
| <b>2</b> Vapour control layer Protect VC Foil       |                   |  |        |                      | -  |                         |
| <b>3</b> Low-E cavity & Cavit-E clip (part of stud) | $\geq 20$         |  | 0.120  | 0.150                | 0.780**                                      | 0.167                   |
| <b>4</b> Insulation batt/timber frame               | 120               | 0.040                                    | 0.120  | 0.150                | 3.000  | 1.000                   |
| <b>5</b> OSB sheathing                              | 9                 | 0.130                                    |        |                      | 0.069  |                         |
| <b>6</b> Protect TF200 Thermo breather membrane     |                   |  |        |                      | -  |                         |
| <b>7</b> Cavity unventilated low-E                  | 50                |  |        |                      | 0.670  |                         |
| <b>8</b> Brick outer leaf                           | 102.5             | 0.770                                    |        |                      | 0.133  |                         |
| Surface resistance, external                        |                   |  |        |                      | 0.040  |                         |
| <i>Total wall thickness</i>                         | 314mm             |  |        |                      | <i>Total resistance</i>                      | 4.882m <sup>2</sup> K/W |

\*\*Thermal resistance data for Protect VC Foil facing a still air cavity has been derived by hot box testing to BS EN 8990:1996 at National Physical Laboratories.

Protect VC Foil with Cavit-E clips creates a 20mm unventilated airspace which is equivalent to 34mm of  $\lambda=0.032$  mineral wool or 38mm of  $\lambda=0.040$  mineral wool fitted between studs.

For further thermal enhancement, foil-faced plasterboard can be used.

## Masonry wall construction

### U-value: 0.23 W/m<sup>2</sup>K

| Layer   | Thickness<br>(mm) | Thermal conductivity<br>$\lambda$ (W/mK) |        | Bridging<br>fraction | Thermal resistance<br>R (m <sup>2</sup> K/W) |                         |
|---|-------------------|--|--------|----------------------|--|-------------------------|
|   |                   | layer                                    | bridge |                      | layer  | bridge                  |
| Surface resistance internal                   |                   |  |        |                      | 0.130  |                         |
| <b>1</b> Plasterboard                         | 12.5              | 0.185                                    |        |                      | 0.068  |                         |
| <b>2</b> Low-E service cavity with            | $\geq 20$         |  | 0.130  | 0.08                 | 0.780**                                      | 0.154                   |
| <b>3</b> Vapour control layer Protect VC Foil |                   |  |        |                      | -  |                         |
| <b>4</b> Lightweight Aircrete block           | 100               | 0.110                                    |        |                      | 0.909  |                         |
| <b>5</b> Insulation                           | 50                | 0.022                                    |        |                      | 2.273  |                         |
| <b>6</b> Low-E unventilated cavity            | 50                |  |        |                      | 0.644  |                         |
| <b>7</b> Brick outer leaf                     | 102.5             | 0.770                                    |        |                      | 0.133  |                         |
| Surface resistance external                   |                   |  |        |                      | 0.040  |                         |
| <i>Total wall thickness</i>                   | 335mm             |  |        |                      | <i>Total resistance</i>                      | 4.977m <sup>2</sup> K/W |

\*\*Thermal resistance data for Protect VC Foil facing a still air cavity has been derived by hot box testing to BS EN 8990:1996 at National Physical Laboratories.

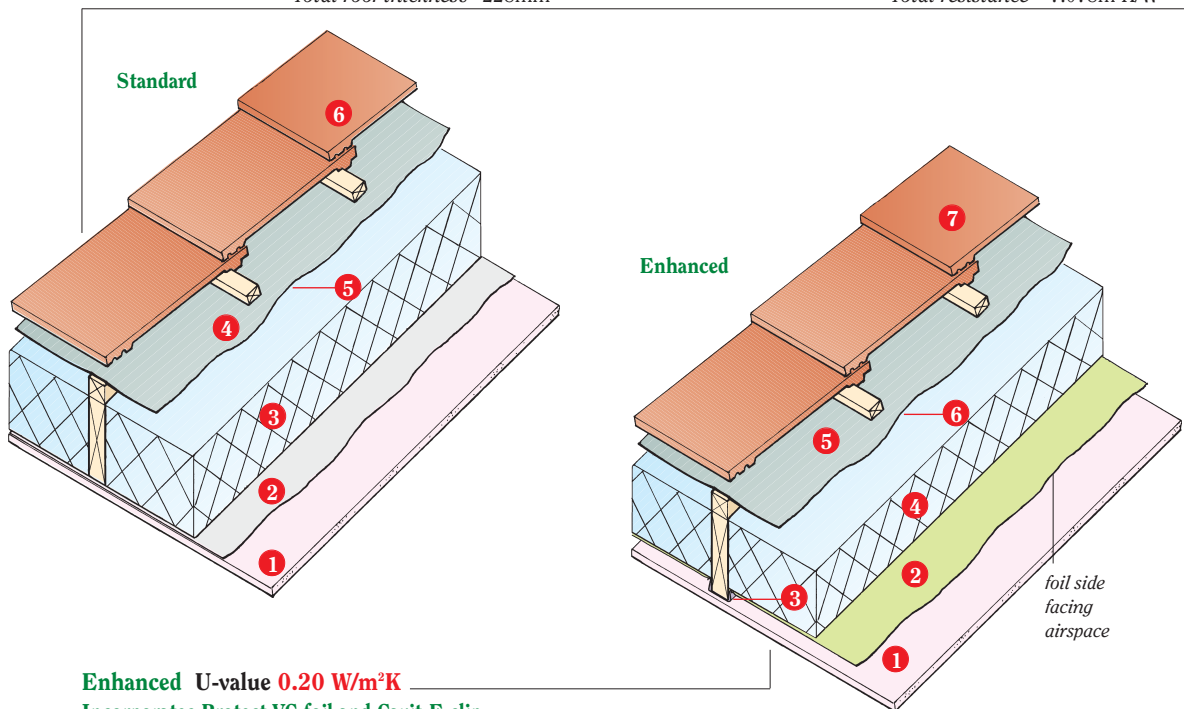
Protect VC Foil and a 20mm airspace can significantly reduce drying out time of the structure, therefore reducing the overall build time of the project. In addition to the benefit of the service cavity, Protect VC Foil will also improve the airtightness of the wall and therefore further limit heat loss.



## Warm roof/ceiling construction

### Standard U-value 0.20 W/m<sup>2</sup>K

| Layer   | Thickness (mm) | Thermal conductivity λ (W/mK) |        | Bridging fraction                               | Thermal resistance R (m <sup>2</sup> K/W) |        |       |
|---|----------------|-------------------------------|--------|---|---|--------|-------|
|   |                | layer                         | bridge |   | layer                                     | bridge |       |
| Surface resistance, internal                      |                |                               |        |   |   |        | 0.100 |
| 1 Plasterboard                                    | 12.5           | 0.210                         |        |   | 0.060                                     |        |       |
| 2 Vapour control layer                            |                |                               |        |   | -   |        |       |
| 3 Insulation board/rafters                        | 150            | 0.022                         | 0.130  | 0.0800  | 6.818                                     | 1.154  |       |
| 4 Protect VP400 vapour permeable underlay         |                |                               |        |   | -   |        |       |
| 5 Air layer ventilated (battens & counterbattens) | 50             |                               |        |   | -   |        |       |
| 6 Tiles (clay)                                    | 15             | 1.000                         |        |   | -   |        |       |
| Surface resistance, external                      |                |                               |        |   |   |        | 0.100 |
| <i>Total roof thickness</i> 228mm                 |                |                               |        | <i>Total resistance</i> 7.078m <sup>2</sup> K/W |   |        |       |



### Enhanced U-value 0.20 W/m<sup>2</sup>K

#### Incorporates Protect VC foil and Cavit-E clip

Compared with standard construction this achieves the same U-value with significantly thinner insulation and the same overall depth of the roof construction.

| Layer   | Thickness (mm) | Thermal conductivity λ (W/mK) |        | Bridging fraction                               | Thermal resistance R (m <sup>2</sup> K/W) |        |        |
|---|----------------|-------------------------------|--------|---|---|--------|--------|
|   |                | layer                         | bridge |   | layer                                     | bridge |        |
| Surface resistance, internal                      |                |                               |        |   |   |        | 0.100  |
| 1 Gyproc Wallboard                                | 12.5           | 0.160                         |        |   | 0.078                                     |        |        |
| 2 Vapour control layer, Protect VC Foil           |                |                               |        |   | -   |        |        |
| 3 Low-E cavity & Cavit-E Clip (part of rafter)    | 20             |                               | 0.130  | 0.0800  | 0.530**                                   | 0.154  |        |
| 4 Insulation board/rafters                        | 130            | 0.022                         | 0.130  | 0.0800  | 5.909                                     | 1.000  |        |
| 5 Protect VP400 vapour permeable underlay         |                |                               |        |   | -   |        |        |
| 6 Air layer ventilated (battens & counterbattens) | 50             |                               |        |   | -   |        |        |
| 7 Tiles (clay)                                    | 5              | 1.000                         |        |   | -   |        |        |
| Surface resistance, external                      |                |                               |        |   |   |        | 0.100* |
| <i>Total roof thickness</i> 228mm                 |                |                               |        | <i>Total resistance</i> 6.717m <sup>2</sup> K/W |   |        |        |

\*This resistance substitutes for surface resistance and the resistance of layers 6-7 because of the ventilated air layer (layer 6)

\*\*Thermal resistance data for Protect VC Foil facing a still air cavity has been derived by hot box testing to BS EN 8990:1996 at National Physical Laboratories.

Protect VC Foil with Cavit-E clips creates a 20mm unventilated airspace which is equivalent to 20mm of λ=0.022 rigid insulation fitted between rafters. The Cavit-E clip also acts as an insulation support, which helps reduce installation time.

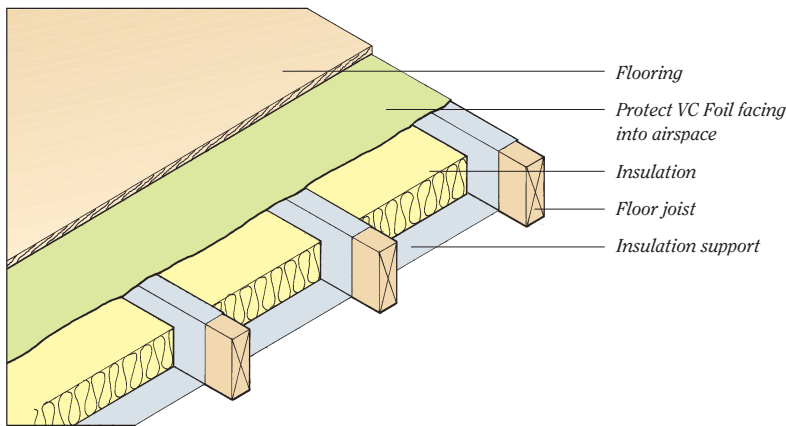
In warm roof constructions, BS 5250: 2002 requires a separate vapour control layer to be used on the warm side of the insulation, which should have sealed laps to reduce the risk of interstitial condensation.

See Protect Sealing Tapes leaflet for further information.

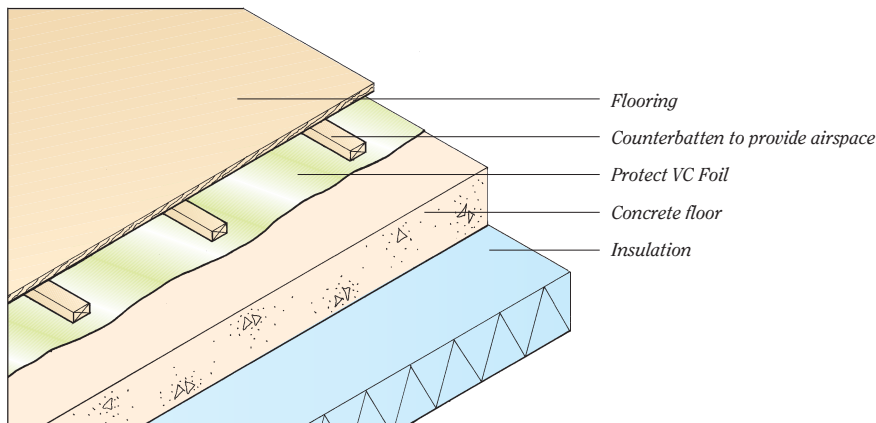
## Floor construction

Protect VC Foil can also be used in suspended and solid floors to enhance their thermal performance. Protect VC Foil and a 25mm airspace when installed in a floor is equivalent to 42mm of  $\lambda 0.040$  mineral wool when fitted between floor joists.

### Suspended floor construction



### Solid floor construction



**Specification clause:**  
 Vapour control layer to be Protect VC Foil supplied by Glidevale Ltd, 2 Brooklands Road, Sale, Cheshire M33 3SS, Telephone: 0161 905 5700 Fax: 0161 905 2085. Email: info@glidevale.com Vapour control layer to be of triple ply construction with polywoven core and solid corrosion resistant aluminium layer with a hemispherical emissivity of 0.05.

Vapour control layer to be fitted into wall/ceiling/floor\* in accordance with BS 5250: 2002 and manufacturers instructions.

\* Delete as required

### GLIDEVALE LIMITED

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Email: info@glidevale.com Web: www.glidevale.com

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

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