

# ECO360 BIO-ENHANCED PIR INSULATION

## Full Fill Cavity Walls

ECO/CT

Bio-enhanced PIR insulation

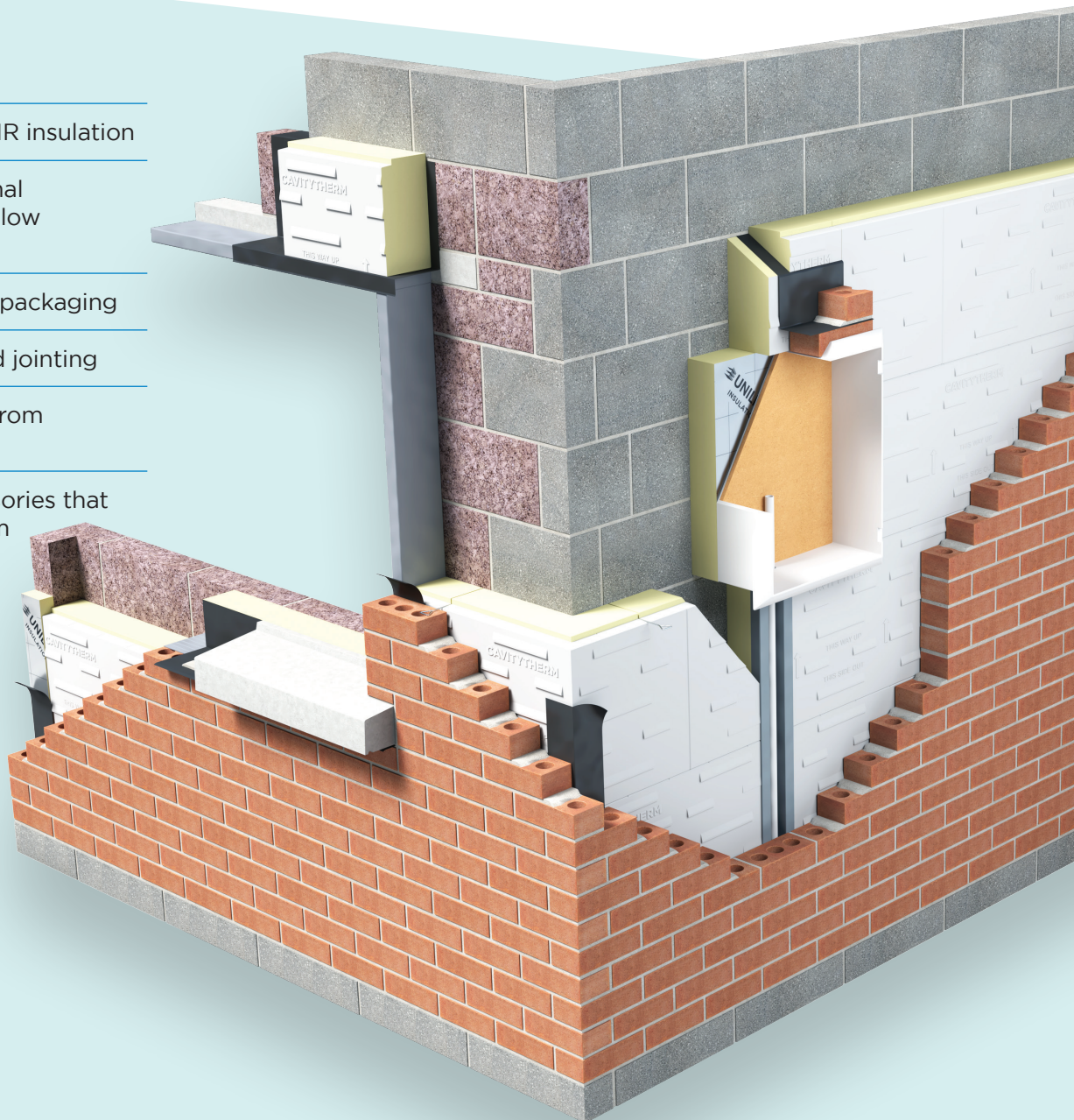
Enhanced thermal performance as low as 0.020 W/mK

Bio-degradable packaging

Fully engineered jointing

Full protection from wind driven rain

Range of accessories that build to a system



**ECO360** BIO-ENHANCED PIR INSULATION

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## ECO/CT

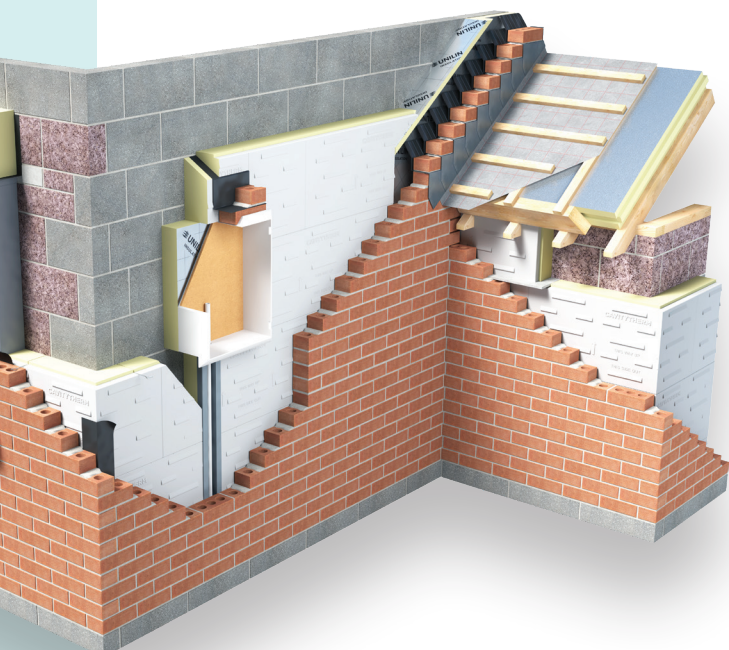
An engineered system providing added resilience against increases in wind-driven rain resulting from climate change.

**ECO/CT** is a bio-enhanced high performance composite board of enhanced PIR with a Lambda value as low as 0.020 W/mK for full fill cavity wall applications.

ECO/CT offers all of the unique benefits of our full fill built-in wall insulation system along with pioneering environmentally sensitive features that meet both the Climate Challenge 2030 and Low Energy Transformation Initiative (formerly LETI) targets. When built into a traditional 110-150mm cavity using standard foundation widths, building skills and local materials ECO/CT achieves U-Values down to 0.12 W/m<sup>2</sup>K. An environmentally conscious solution to low energy design, that results in traditional homes that meet the 2030 Climate Challenge targets.



SHIPLAP JOINTING



### Benefits

- Bio-enhanced PIR insulation
- Enhanced thermal performance as low as 0.020 W/mK
- Halogen free
- Bio-degradable packaging
- Moisture directed to outer surface
- Fully engineered jointing
- Fully recyclable HIPS facer provides wind-driven rain protection
- Wide range of system compatible accessories that build to a system
- Reduced packaging materials

### Specification Clause

The built-in full fill cavity wall insulation shall be ECO360 CavityTherm manufactured to EN 13165 by Unilin Insulation, including corner boards and ancillary detail components, comprising a rigid Polyisocyanurate (PIR) core between low emissivity foil facings with engineered HIPS outer skin. The ECO360 CavityTherm \_\_\_mm with a declared Lambda value of 0.020 W/mK to achieve a U-Value of \_\_\_W/m<sup>2</sup>K for the wall element. To be installed in accordance with instructions issued by Unilin Insulation.

Refer to NBS clause F30 150, F30 12.



### Thermal Resistances

Insulation Thickness (mm)	R-Value (m <sup>2</sup> K/W)
105	5.25
120	6
145	7.25

\*add 5mm for engineered facer for total thickness

### Resistance 'R' Values

The resistance value of any thickness of Unilin insulation can be ascertained by simply dividing the thickness of the material (in metres) by its agrément declared lambda value, for example: Lambda 0.020 W/mk and thickness 105mm -> 0.105/0.020 -> R-Value = 5.25. In accordance with EN 13165, R-Values should be rounded down to the nearest 0.05 (m<sup>2</sup>K/W).

## ECO/CT

### The Complete Cavity Wall System

Unilin offers preformed Corner Panels (XT-CT/CN) as part of the ECO360 range. We also offer a range of accessories that are compatible for use with ECO/CT.

#### Included with Cavity Wall System

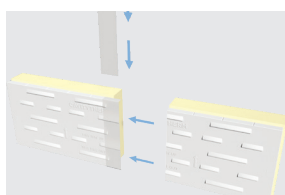


Preformed corner panels

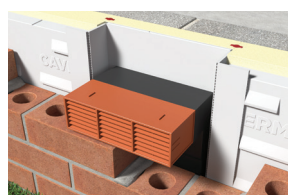


Integral rain barrier

#### Cavity Wall System compatible with:



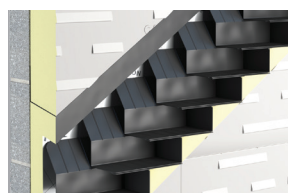
Jointing strip



Service void panels



Hockey stick insulation



Cavity tray channel

## ECO/CT

Length (mm)	1200
Width (mm)	450
Thickness (mm)	110, 125, 150

\*Overall product thickness

### Property & Units

Thermal Conductivity	0.020 (W/mK)
Compressive Strength	>120 (kPa)
Reaction to Fire	NPD

Unilin Declaration of Performance (DoP) for this product is available for download from our website.

## Typical U-Values

**Table 1**

#### Build up:

- Plasterboard on dabs
- 100mm Inner Leaf Blockwork
- ECO CT
- Unventilated Cavity
- Brick

#### Block Thermal Conductivity

	0.11	0.15	0.46	1.13
110	0.15	0.16	0.17	0.17
125	0.14	0.14	0.15	0.15
150	0.12	0.12	0.12	0.13

Thickness (mm)

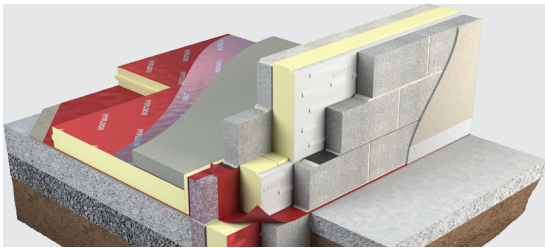
Note: U-Values are indicative only. Please contact our technical department for a calculation suited to your specific project.

# INSTALLATION GUIDELINES

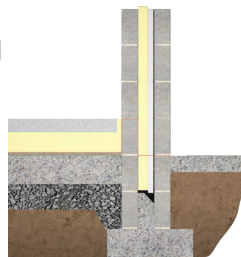
## ECO/CT

### Procedure: Internal and external build methods

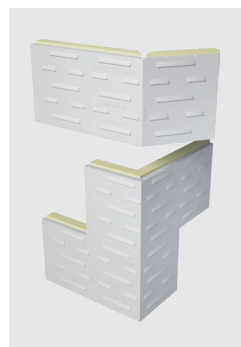
1. ECO/CT can be built into cavity walls where either the outer or inner leaf is built first. Riser boards should be used below DPC level to ensure a min 150mm overlap with the floor insulation. The receiving block should be plumb to provide a flat surface to accept the insulation.



2. Where required, Radon barriers or DPCs should be dressed over the cavity either dissecting the board or dressed behind the riser boards and across the cavity below the insulation. The insulation should be butted tightly either side of the barrier to provide thermal continuity. Preformed detailing of radon barriers provides a more accurate solution. Contact the membrane manufacturer for further guidance on installation and best practice.



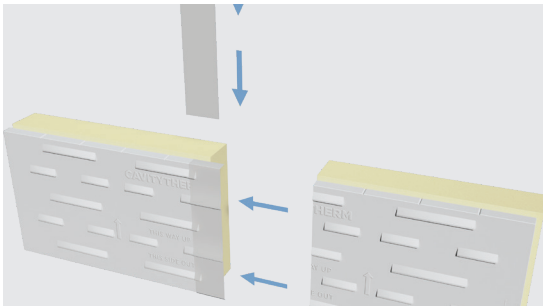
3. As with setting out, installation should commence from adjacent corners using the Unilin preformed corner boards. Where preformed corner board are not used and boards are cut on site a vertical DPC is required at external and internal corners. Alternate Corner Pieces will achieve the offset break-bonded pattern for the insulation.



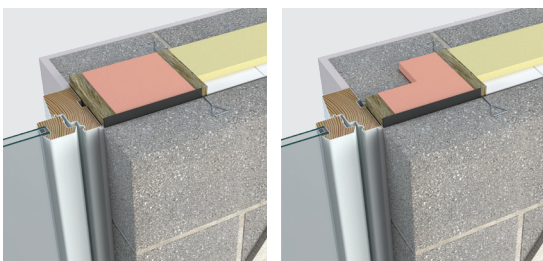
4. Install the first row of insulation boards, allowing for the floor insulation overlap, supported by at least 2 wall ties per board. Boards should be installed with the tongue upper most and the profiled face outer most, placed tightly against the inner face of the outer blockwork.
5. Wall ties conforming to b BS EN 845-1: 2013 + A1: 2016 should be used and placed at approx. 600mm centres, do not place directly on the DPC.
6. The type and spacing of wall ties are dependent on geographical area, cavity width, wall length and height and opening sizes. They should be placed at centres recommended by manufacturers to suit the wall specification and placed within the preformed notches of the ECO/CT.
7. In cavities up to 150mm, typically SS wire ties at 2.5/m<sup>2</sup> meet structural requirements, at these specifications the ties do not have a detrimental effect on the thermal performance (larger wall ties will reduce the thermal performance)
8. Slots should be cut into the exposed foam edge of the board to follow the sloped surface of the facing to allow the ties to run down towards the outer leaf.
9. Under PD 6697:2019 Recommendations for the design of masonry structures to BS EN 1996-1-1 and BS EN 1996-2 it is recommended that no more than four courses of block are laid on the preceding skin before installation of the insulation. This allows for wall ties to be inserted accurately and without bending and thus distorting the physical characteristics of the wall ties. Ensure the wall is level and free of any protrusions before installing the insulation with all edges tightly interlocked.
10. Mortar should be struck from the inner cavity face of the block to ensure mortar squeeze is minimised on the cavity side. The two courses of blockwork can then be built, ensuring the mortar is struck back from the cavity face to prevent mortar squeeze. The second skin of block should be built tight against ECO/CT.

## ECO/CT

11. All boards should be tightly interlocked with vertical joints staggered. Continue the installation until a reveal is reached or boards abut mid wall. To form a butt joint, remove the end profile from the abutting board(s) and fit tightly against the cut edge of the adjoining board.
12. In the case of smaller sections of board being joined, when building from the outside, the junction can be taped with proprietary tape from Bostik or Venture Tapes. If building from the inside on smaller sections, tape can be applied and adjoining sections are lifted into the cavity. On larger sections, the Unilin jointing strip can be used, ensure the joint is well butted (see diagram).



13. Alternate boards should be cut to different lengths to create a break-bonded pattern if the corner boards have not been used.



14. It is recommended (to avoid piercing the boards with additional wall ties at reveal openings), that the Safe-R Close-R reveal panel is used to achieve a 4 hour fire rating and ensure wall ties are placed in the correct position i.e. wall ties placed within 225mm of the opening on each

board course. Alternatively, where a return block is used the Safe-R Close-R 75mm Return product accommodates wall ties to be placed within 225mm of the opening without the need to penetrate the ECO/CT board engineered facer

15. A vertical DPC should be provided that extends 25mm beyond the width of the closer.
16. Continue installation to total wall height or if truncated, protect by an approved cavity tray, installed to manufacturer recommendations. ECO/CT should be separated from any flues with min 200mm of non-combustible material.
17. Where openings such as doors and windows are in close proximity, it is recommended that a continuous lintel or cavity tray is used. Damp-proofing at lintels, sills and penetrations must be provided with DPCs/Trays with stop ends and weep holes, where required.
18. Accredited detailing must be followed and ensure that installation is in accordance with building regulations and accounted for in the SAP calculations.
19. At service voids and penetrations, bespoke detail pieces are available to provide insulation continuity (see diagrams below).
20. Contact our Technical team for further resources on installation best practice, such as online 'Tool Box Talk' training, on-line animations and instructions.

### NOTE

Internal & external corners can be formed on site by either butt jointed or mitred methods, however a vertical DPC will also be required. Preformed corners are also available from Unilin. Where preformed corner boards are used a vertical DPC is not required.

# INSTALLATION GUIDELINES

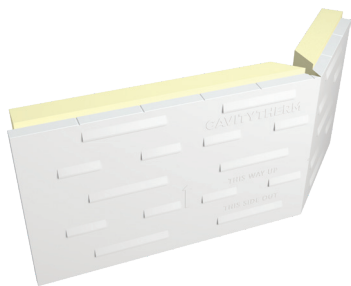
## ECO/CT

### Corners

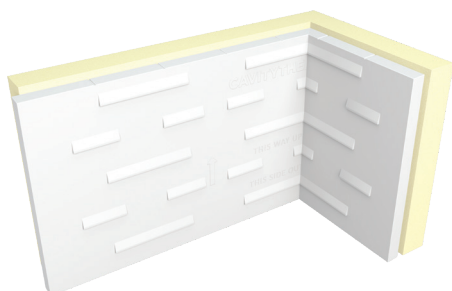
1. Preformed corner panels are available from Unilin and are recommended to ensure accuracy is achieved at this crucial junction. Alternatively, internal & external corners can be formed on site by either butt jointed or mitred methods. Corners should be protected with a vertical DPC.
2. Internal & external butted corner details are formed by closely butting the boards. It is important that they are closely jointed, the end profile should be removed to create square edges then cut and flatten the profiled flutes 100mm in from the board edge.
3. Alternatively the boards are cut at an angle to create a mitred junction so that all interfaces are uninterrupted.

### Note

It is a requirement that all corner details formed on site should incorporate a vertical DPC, built in during the build process.



External corner



Internal corner

### DPCs

In accordance PD 6697:2019

Recommendations for the design of masonry structures to BS EN 1996-1-1 and BS EN 1996-2, DPC design

should be based on the assumption that rain will penetrate the outer leaf of the wall and run down the inside of the outer leaf. Where the cavity is bridged, e.g. by cavity fill, lintels, structural beams, floor slabs or pipes, there is a danger that water will be conducted across it to cause dampness inside the building.

To avoid this problem, it is essential that watertight cavity trays are provided above all bridges of the cavity (other than wall ties), so that water is diverted to the outer leaf or clear of the bridges'.

- Boards should be protected from weather during breaks in the installation.
- Full animations of board's features, jointing procedures and installation are available on the web site at [unilininsulation.co.uk](http://unilininsulation.co.uk)

# FAQS

## ECO/CT

### What is ECO/CT?

ECO/CT wall insulation board is a high performance composite board of PIR core with a lambda value of 0.020 W/mK. The boards have gas tight facings with one face bonded to a profiled HIPS skin during manufacture to provide a drainage plane. ECO/CT's unique profiled facing directs any moisture that might have penetrated the external wall down the protective facing and back onto the external leaf. The board includes specifically designed rebated edge detailing on all four edges to allow the system to tightly interlock when installed.

### What is the real benefit using ECO/CT?

Put simply, the U-Values achieved by placing ECO/CT into your standard 150mm cavity meet the Future homes and Passive House standards. It builds as a 'system to ensure continuity. You can physically see that the procedures on site are being followed. It's a very practical, affordable solution to low energy design.

### What wall ties do I use with ECO/CT?

Standard S/S wire wall ties are used with ECO/CT. At up to 2.5 ties/m<sup>2</sup> the thermal impact is negligible because the cavity is kept to a reasonable width. Pushing the cavity wider and adding greater amounts of insulation will necessitate low conductivity ties, and result in worse Thermal Bridging at junctions. It is for this reason that a U-Value of around 0.15W/m<sup>2</sup>K is seen as optimum by regulations and Passive House.

### Why slope the wall ties down to the outer face?

This is not specific to ECO/CT, all wall ties in any construction should slope slightly down to prevent water travelling along the wall ties into the construction. Wall ties must be kept clean and free of mortar.

### What thicknesses of ECO/CT are available?

ECO/CT is manufactured for 100mm, 110mm, 125mm and 150mm cavities, and achieves U-Values as low as 0.12 W/m<sup>2</sup>K. Greater thicknesses may be available subject to quantity and lead time.

### What building types can use ECO/CT?

ECO/CT can be used in new external masonry cavity walls up to 18m\* in height in domestic and non-domestic buildings.

\*Current building regulations should also be consulted to ensure compliance

### ECO/CT has a lot of accessories as part of the 'system', what are they for?

An excellent wall U-Value is not the only item that must be addressed to achieve Future Homes Standards and Passive House performance. Airtightness and Thermal Bridging must also be improved. Thermal Bridging is in fact just 'good detailing' and is accounted for in SAP. Unilin is the only insulation board manufacturer that addresses gaps or breaks within the continuity of the insulation layer. How do you detail insulation around stepped cavity trays, periscope vents in

suspended floors or at corners, or meter boxes? Unilin has developed bespoke insulated pieces to ensure that these details are well insulated so as to avoid Thermal Bridging and possible condensation and mould growth.

### CavityTherm addresses Thermal Bridging, but how do I use this in my SAP calculation?

All the details available to download from [unilininsulation.co.uk](http://unilininsulation.co.uk) have been based on the Accredited Construction Details (ACDs). These are standard details that have been accounted for in SAP for over many years. What Unilin has done is just replaced the generic insulation included within them with ECO/CT, this has vastly improved the resultant thermal transmittance through all the specified junctions; corners, wall/floor, reveals etc, and will deliver a Y-Value for most dwellings below the 0.05 target asked for under building regulations. Unilin has fully BRE qualified Thermal Bridging assessors with the added assurance that the technical team members you speak with are fully trained. U-Value and condensation risk analysis calculations are covered by the BBA/TIMSA competency scheme.

### Is there a benefit in the 'Engineered edge detail'?

The Building Regulations now ask that insulation systems be 'continuous' and are installed in accordance with accredited detailing. The jointing system in Unilin products achieves this, encourages a more accurate build, and avoids the 0.01 U-Value penalty that should be applied when calculating to BR443.

### When a board is cut what tape do I use to make the join?

When two abutting boards are to join, cut the profiled edge from each board and ensure that they are closely butted. The joint should be sealed. When building the inner leaf first - seal with a waterproof tape. The tape should be applied to a dry surface. When building from the inside a preparatory self adhesive jointing strip is available to insert over the joint. Any penetrations or small repairs can be made with the tape or sealant. Any services running through the insulation layer should be sloped to the outside. DPCs should be dressed over services.

### You recommend the use of a 'Cavity Board' - what is that?

The use of a cavity board is recommended during construction. It is a board that is placed over the installed boards as the inner leaf is raised to catch any mortar drops that might fall. If mortar does fall onto the upper edge of the ECO/CT the HIPS skin is easily cleaned with a damp cloth.

### Where do I get further information?

Full details relating to compliance with Building Regulations, independently verified technical specification, assessment criteria and technical investigations, design considerations and installation guidance are available on [www.unilininsulation.co.uk](http://www.unilininsulation.co.uk)

## HANDLING, CUTTING & STORAGE

Unilin insulation should be stored off the ground, on a clean, flat surface and must be stored under cover. The polythene wrapping is not considered adequate protection for outside exposure. Care should be taken to protect the insulation in storage and during the build process.

The insulation boards can be readily cut using a sharp knife or fine toothed saw. Ensure tight fitting of the insulation boards to achieve continuity of insulation as asked for within the ACDs. Appropriate PPE should be worn when handling insulation. Please refer to Health & Safety data sheets on our website.

The boards are wrapped in bio-degradable film and each pack is labelled with details of grade/type, size and number of pieces per pack.

### Durability

Unilin Insulation products are stable, rot proof, provide no food value to vermin and will remain effective for the lifetime of the building, depending on specification and installation. Care should be taken to avoid contact with acids, petrol, alkalis and mineral oil. When contact is made, clean materials in a safe manner before installation.







# Expect more Knowledge

Unilin Insulation, formerly Xtratherm, is one of the UK's largest manufacturers and suppliers of insulation. We have a 20-plus year history of working in partnership with construction professionals to close the gap between design and as-built performance.

Higher standards of fabric performance call for greater adherence to best practice detailing. To achieve this and to 'close the gap' between design and build, we provide a dedicated Technical Team, all qualified to the highest standards of competency in U-Value calculation and condensation risk analysis.

#### Here to support you

- BRE listed Thermal Bridging Detailing
- BRE Trained Modelling
- BBA/TIMSA calculation competent
- Warranted Calculations available
- Immediate technical response
- SAP Qualified
- Insulation systems to deliver real onsite performance

#### Get in touch

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### **The Sustainable Solution**

Specifying Unilin Insulation is a real commitment to minimising energy consumption, harmful CO<sub>2</sub> emissions and their impact on the environment. Using our products is one of the most effective ways to reduce energy consumption – in fact, after just eight months the energy they save far outweighs the energy used in their production. In addition, our manufacturing facilities operate to an ISO 14001 certified Environmental Management System.

### **Environmental Product Declaration (EPD)**

An Environmental Product Declaration or EPD for a construction product indicates a transparent, robust and credible step in the pursuit and achievement of real sustainability in practice, it is a public declaration of the environmental impacts associated with specified life cycle stages of that product. Unilin EPDs have been independently verified in accordance with EN 15804+A2:2019 and ISO 14025 accounting for stages of the LCA from A1 to A3, with options A4-A5 and modules C1-C4 and D included. The process of creating and EPD allows us to improve performance and reduce resource wastage through improvements in product design and manufacturing efficiency. They play a crucial role in manufacturing and construction and are increasingly asked for by industry.

### **EPDs and BREEAM**

BREEAM is primarily trying to encourage designers to take EPDs into consideration when specifying products. BREEAM requires EPDs to be verified by a third-party. For the Mat O2 category, points are awarded based on whether EPDs are generic, manufacturer-specific, or product-specific. Non 3rd party verified EPDs to EN 15804 cannot be accepted. All of Unilin EPDs are externally verified.

### **Responsible Sourcing**

Unilin has BES 6001 certification for responsible sourcing. The second BREEAM credit under that category is based on responsibly-sourced materials – at least 80% of the total insulation used in roofs, walls, ground floors and services must meet any of tier levels 1 to 6 in the BREEAM table of certification schemes. Our Environmental Management System is certified under EN ISO 14001, and our raw materials come from companies with similarly certified EMS (copies of all certificates are available for BREEAM assessments). This level of responsible sourcing meets tier level 6 in the BREEAM table.

Good workmanship and appropriate site procedures are necessary to achieve expected thermal and airtightness performance. Installation should be undertaken by professional tradespersons. The example calculations are indicative only, for specific U-Value calculations contact Unilin Insulation Technical Support. Unilin technical literature, Agrément certifications and Declarations of Performance are available for download on the Unilin Insulation website. The information contained in this publication is, to the best of our knowledge, true and accurate at the time of publication but any recommendations or suggestions which may be made are without guarantee since the conditions of use are beyond our control. Updated resources may be available on our websites. All images and content within this publication remain the property of Unilin Insulation.



**ISO 45001** Occupational Health & Safety Management Systems  
**ISO 9001** Quality Management Systems  
**ISO 14001** Environmental Management Systems