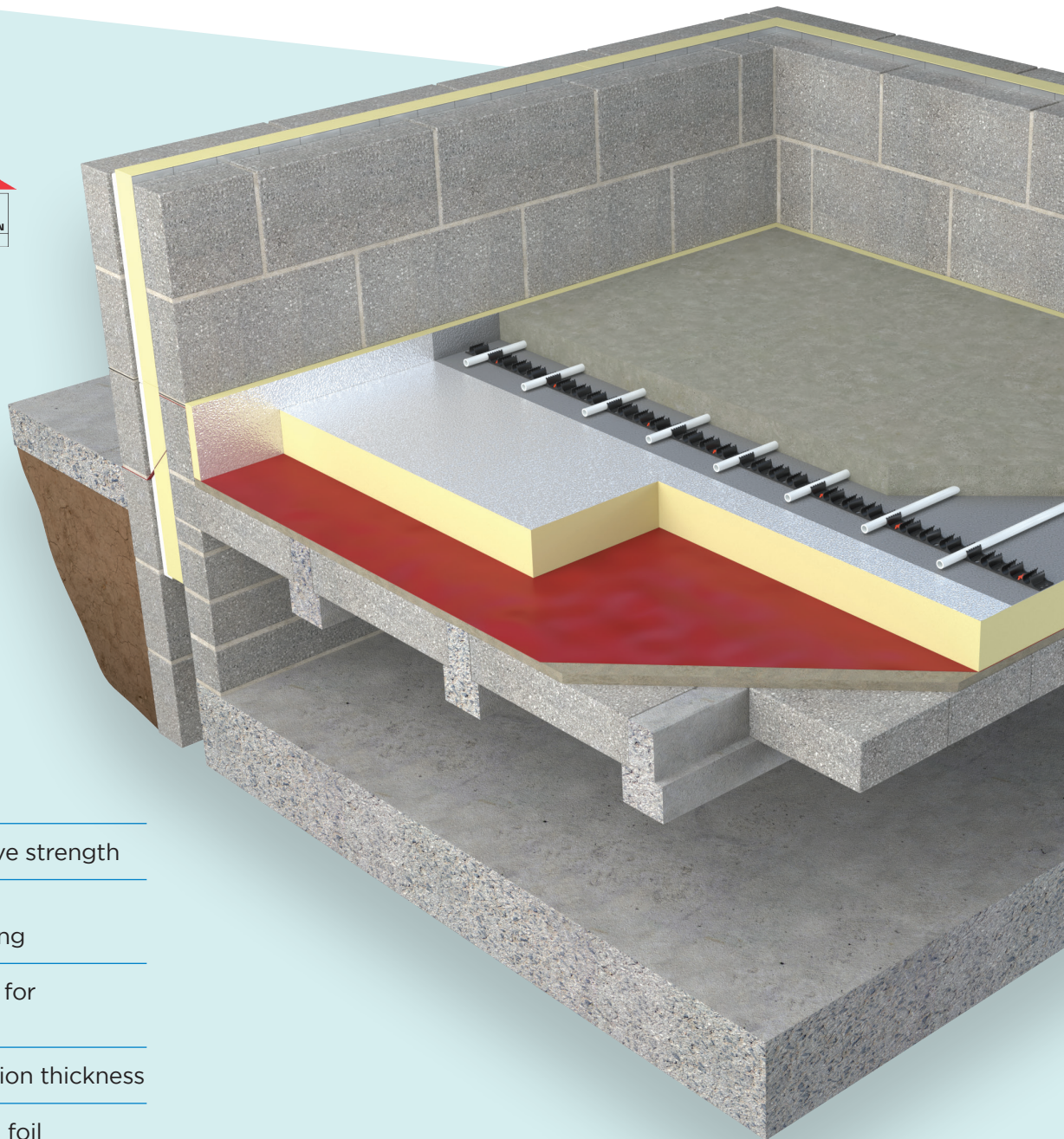


XTROLINER

SUPERIOR PERFORMANCE
PIR INSULATION

Solid & Suspended Floors

XO/UF



High compressive strength

Suitable for
underfloor heating

Perimeter strips for
robust detailing

Reduced insulation thickness

Robust textured foil



XTROLINER SUPERIOR PERFORMANCE
PIR INSULATION

Solid & Suspended Floors

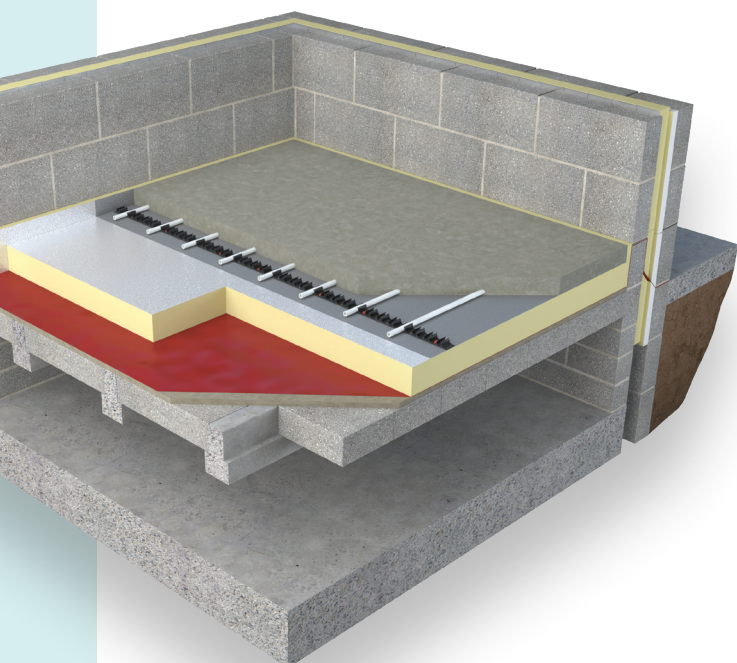
XO/UF

XtroLiner is a superior performance insulation with a Lambda Value of 0.021 Wm/K and a Euroclass C fire classification. It is faced with a robust PIR aluminium foil and is available with engineered jointing to deliver improved Thermal Bridging detailing. The floor in any building is an area of considerable downward heat loss when not properly insulated.

XtroLiner Underfloor will significantly improve the U-Value of new and existing floors. It is lightweight, easy to install and combines high compressive strength with low thermal conductivity, providing a high performance solution for floor insulation.

Benefits

- High compressive strength
- Suitable for underfloor heating
- Perimeter strips for robust detailing
- Reduced insulation thickness
- Robust textured foil

**Specification Clause**

The floor insulation shall be XtroLiner XO/UF manufactured to EN 13165 by Unilin Insulation, comprising a rigid modified Polyisocyanurate (PIR) core with textured robust low emissivity foil facings. The XtroLiner XO/UF __ mm with a Agrément declared Lambda value of 0.021 W/mK to achieve a U value of __ W/m²K for the floor element. To be installed in accordance with instructions issued by Unilin Insulation.

An Environmental Product Declaration (EPD), certified by IGBC is available for this product. Please contact technical support for further details.



Refer to NBS clause M10 290, M10 40, M13 260 M13 40.

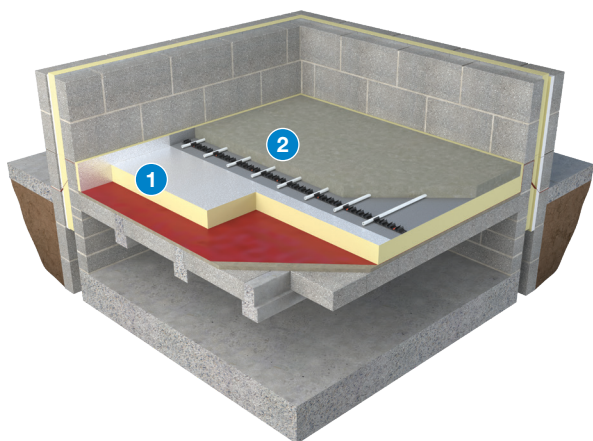
**Thermal Resistances**

| Thickness (mm) | R-Value (m²K/W) |
|----------------|-----------------|
| 50 | 2.35 |
| 60 | 2.85 |
| 75 | 3.55 |
| 80 | 3.80 |
| 100 | 4.75 |
| 120 | 5.70 |

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 0.021 W/mK and thickness 80mm -> $0.080 / 0.021 \rightarrow$ R-Value = 3.80. In accordance with EN 13165, R-Values should be rounded down to the nearest 0.05 (m²K/W).

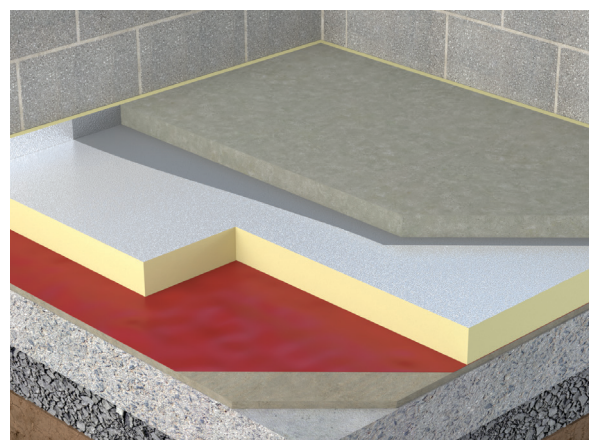
XO/UF



1. Good detailing at the wall/floor junction is essential in reducing Thermal Bridging. By placing an upstand of Unilin Perimeter strip (XO/STR) insulation with a minimum 25mm thickness around the external and internal wall/floor junctions, a robust detail is created.
2. XtroLiner Underfloor is lightweight and suitable for use with underfloor heating. Thanks to its thickness to performance ratio, it allows for reduced insulation thickness. The boards should be laid with closely butted joints, laid staggered with a break bonded pattern and fitted tightly at edges and around any service penetrations.

Note

XtroLiner Underfloor provides one of the most efficient means of floor insulation. It has the strength and thermal properties required to reach the high performance U-Values asked for in the Building Regulations.



XO/UF

| | |
|----------------|--------------------------------------|
| Length (mm) | 2400 |
| Width (mm) | 1200 |
| Thickness (mm) | 25, 30, 40, 50, 60, 75, 80, 100, 120 |

Other thicknesses may be available depending on minimum order quantity and lead time.

Property & Units

| | |
|----------------------|--------------------|
| Thermal Conductivity | 0.021 (W/mK) |
| Compressive Strength | >150 (kPa) |
| Reaction to Fire | Euroclass C-s2, d0 |

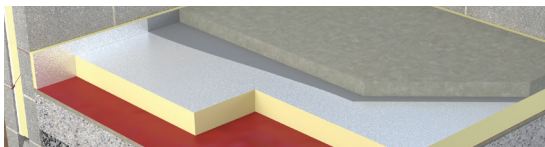
Unilin Declaration of Performance (DoP) for this product is available for download from our website.

INSTALLATION GUIDELINES

XO/UF

Below Concrete Slab

1. Lay and level the hardcore in layers 150mm min/ 250mm max and compact well.
2. Sand blind base to create a level surface and to protect DPM.
3. The damp proof membrane (DPM), normally 1200g polythene or radon barrier, should be laid over the blinding, tape lapped joints to prevent passage of ground moisture. Carry DPM up to the wall to meet and seal with the DPC course. Contact the membrane manufacturer for further guidance on installation and best practice.
4. Lay the XtroLiner Underfloor across the DPM. If two layers are required, lay the boards in a staggered jointed pattern. Closely butt all edges.
5. Place Unilin Perimeter Strips (XO/STR) around floor perimeter to provide robust detailing in order to reduce Thermal Bridging. Ensure top of perimeter strip is level with top of floor finish. Seal around any service penetrations.



6. Lay a thin gauge polythene sheet, to act as a separating layer, over the insulation with 150mm lap joints. VCL should be taped at the joints to ensure a continuous separating layer, as per BRE GBG 45 "Insulating Ground Floors".
7. If underfloor heating is required, lay pipes and clip to the insulation boards through the separating layer. Follow UFH manufacturer's guidelines.
8. Pour and compact concrete slab to required finish floor level.

Below Floor Screed

1. Lay and level the concrete slab, allowing sufficient time to dry out, as per BS 8203.
2. Beam and block floors may need a levelling screed or grouting to ensure base level. Refer to manufacturer's guidelines.
3. The damp proof membrane (DPM),

normally 1200g polythene or radon barrier, should be laid over the blinding, tape lapped joints to prevent passage of ground moisture. Carry DPM up to the wall to meet and seal with the DPC course. Contact the membrane manufacturer for further guidance on installation and best practice.

4. Lay the XtroLiner Underfloor boards across the DPM. If two layers are required, lay the boards in a staggered jointed pattern. Closely butt all edges.
5. Place Unilin Perimeter Strips (XO/STR) around floor perimeter to provide robust detailing in order to prevent Thermal Bridging. Ensure top of perimeter strip is level with top of floor finish. Seal around any service penetrations.
6. Lay a thin gauge polythene sheet, to act as a separating layer, over the insulation with 150mm lap joints. Separating layer should be taped at the joints to ensure a continuous separating layer, as per BRE GBG 45 "Insulating Ground Floors".
7. If underfloor heating is required, lay pipes and clip to the insulation boards through the separating layer. Follow manufacturer's guidelines.
8. Pour screed according to screed manufacturer's guidelines.

Suspended Timber Floor

1. Install joists in the normal manner, ensuring adequate ventilation.
2. Measure gaps between joists and cut XtroLiner Underfloor to size, allowing for variations in joist spacings. Allow slight oversize of cut to achieve 'friction fit' and seal any gaps with expanding foam.
3. Mechanically fasten treated timber battens to the joists, allowing for correct thickness of insulation. Galvanised nails or saddle clips may also be used, ensuring nails are left 40mm proud of the joists.
4. Install XtroLiner Underfloor between joists with joints tightly butted and seal any gaps with expanding foam.
5. If two insulation layers are required, lay the boards in a staggered jointed pattern, also sealing any gaps with expanding foam.
6. Floor boards should be laid directly to the joists.

THERMAL PERFORMANCE

XO/UF

Typical U-Values



Table 1

U-Value calculations to EN ISO:6946

XO/UF Insulation for Ground Supported slab

Build up:

- 65mm screed
- Separating layer polythene sheet
- XO/UF with perimeter strip
- DPM 1200 gauge polythene or radon barrier
- Concrete slab

Perimeter/Area Ratio (P/A)

| Thickness (mm) | | 0.30 | 0.40 | 0.50 | 0.60 | 0.70 | 0.80 |
|----------------|-----|------|------|------|------|------|------|
| | 75 | 0.17 | 0.19 | 0.20 | 0.20 | 0.21 | 0.21 |
| | 80 | 0.17 | 0.18 | 0.19 | 0.19 | 0.20 | 0.20 |
| | 100 | 0.14 | 0.15 | 0.16 | 0.16 | 0.17 | 0.17 |
| | 120 | 0.12 | 0.13 | 0.14 | 0.14 | 0.14 | 0.14 |
| | 150 | 0.11 | 0.11 | 0.12 | 0.12 | 0.12 | 0.12 |

Table 2

U-Value calculations to EN ISO:6946

XO/UF Beam & Block Suspended Floor

Build up:

- 65mm screed
- Separating layer polythene sheet
- XO/UF with perimeter strip
- Beam and block

Perimeter/Area Ratio (P/A)

| Thickness (mm) | | 0.30 | 0.40 | 0.50 | 0.60 | 0.70 | 0.80 |
|----------------|-----|------|------|------|------|------|------|
| | 75 | 0.19 | 0.20 | 0.20 | 0.21 | 0.21 | 0.21 |
| | 80 | 0.18 | 0.19 | 0.19 | 0.20 | 0.20 | 0.20 |
| | 100 | 0.15 | 0.16 | 0.16 | 0.17 | 0.17 | 0.17 |
| | 120 | 0.13 | 0.14 | 0.14 | 0.14 | 0.14 | 0.15 |
| | 150 | 0.11 | 0.12 | 0.12 | 0.12 | 0.12 | 0.12 |

THERMAL PERFORMANCE

XO/UF

Typical U-Values



Table 3

U-Value calculations to EN ISO:6946 for IRL
XO/UF Suspended Hollow Core floor

Build up:

- 65mm screed
- Separating layer polythene sheet
- XO/UF with perimeter strip
- Hollow core slab

Perimeter/Area Ratio (P/A)

| Thickness (mm) | | 0.30 | 0.40 | 0.50 | 0.60 | 0.70 | 0.80 |
|----------------|-----|------|------|------|------|------|------|
| | 75 | 0.18 | 0.19 | 0.19 | 0.20 | 0.20 | 0.20 |
| | 80 | 0.17 | 0.18 | 0.19 | 0.19 | 0.19 | 0.19 |
| | 100 | 0.15 | 0.15 | 0.16 | 0.16 | 0.16 | 0.16 |
| | 120 | 0.13 | 0.13 | 0.14 | 0.14 | 0.14 | 0.14 |
| | 150 | 0.11 | 0.11 | 0.11 | 0.12 | 0.12 | 0.12 |

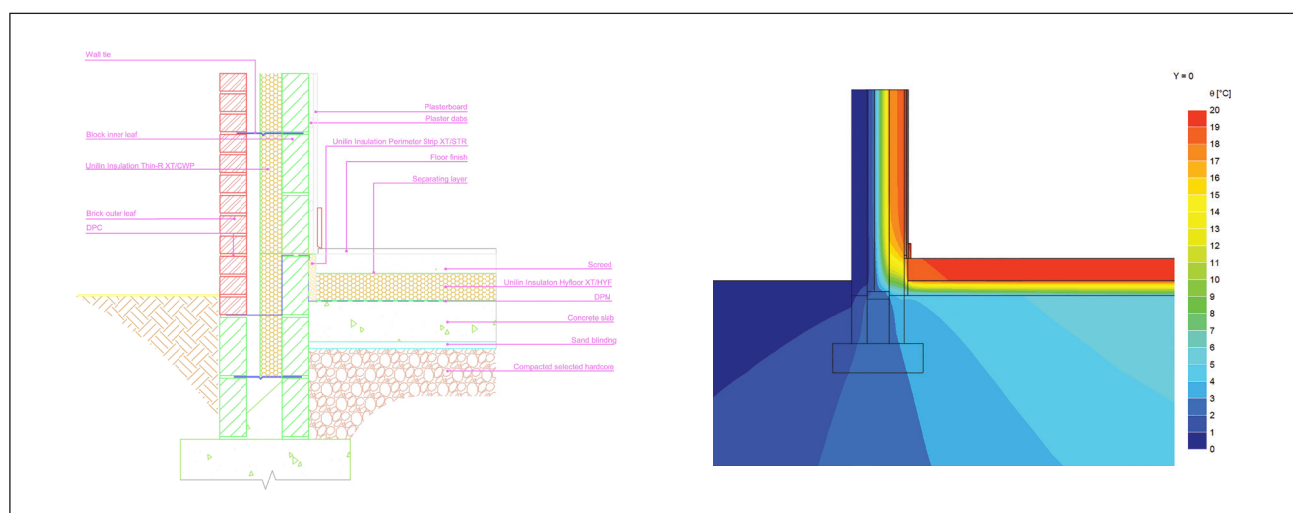
THERMAL BRIDGING

XO/UF

To achieve good detailing, Accredited Construction Details (ACDs) should be followed during the planning, design and build process.

Unilin Psi Values Using Accredited Details

| Accredited Details | Block Type | 75mm Psi (ψ) | 100mm Psi (ψ) | Unilin Certificate Reference |
|-----------------------------|------------|---------------------|----------------------|------------------------------|
| E2 (MCI-WD-02) - Lintel | Dense 1.13 | 0.024 | 0.027 | UI-CWP-E2-WD-02 V1 |
| E2 (MCI-WD-02) - Lintel | Med 0.31 | 0.024 | 0.027 | UI-CWP-E2-WD-02 V1 |
| E2 (MCI-WD-02) - Lintel | Light 0.15 | 0.025 | 0.028 | UI-CWP-E2-WD-02 V1 |
| E3 (MCI-WD-04) - Sill | Dense 1.13 | 0.021 | 0.024 | UI-CWP-E3-WD-04 V1 |
| E3 (MCI-WD-04) - Sill | Med 0.31 | 0.021 | 0.024 | UI-CWP-E3-WD-04 V1 |
| E3 (MCI-WD-04) - Sill | Light 0.15 | 0.022 | 0.025 | UI-CWP-E3-WD-04 V1 |
| E4 (MCI-WD-06) - Jamb | Dense 1.13 | 0.001 | 0.000 | UI-CWP-E4-WD-06 V1 |
| E4 (MCI-WD-06) - Jamb | Med 0.31 | 0.001 | 0.000 | UI-CWP-E4-WD-06 V1 |
| E4 (MCI-WD-06) - Jamb | Light 0.15 | 0.001 | 0.001 | UI-CWP-E4-WD-06 V1 |
| E5 (MCI-GF-01) - Floor/Wall | Dense 1.13 | 0.166 | 0.168 | UI-CWP-E5-GF-01 V1 |
| E5 (MCI-GF-01) - Floor/Wall | Med 0.31 | 0.079 | 0.078 | UI-CWP-E5-GF-01 V1 |
| E5 (MCI-GF-01) - Floor/Wall | Light 0.15 | 0.058 | 0.058 | UI-CWP-E5-GF-01 V1 |
| E16 - External corner | Dense 1.13 | 0.055 | 0.047 | UI-CWP-E16-EXT-CRN V1 |
| E16 - External corner | Med 0.31 | 0.048 | 0.042 | UI-CWP-E16-EXT-CRN V1 |
| E16 - External corner | Light 0.15 | 0.044 | 0.039 | UI-CWP-E16-EXT-CRN V1 |



For further information on this topic: Unilin has published Thermal Bridging guidance, request your copy from our technical department.

Unilin has an extensive library of downloads available on our website. These include ACDs, BIM files, CAD drawings and Agrément certificates. We also offer CPD training on Thermal Bridging as well as a wide variety of building regulation topics.

[Visit unilininsulation.co.uk](http://unilininsulation.co.uk)



FABRIC ENERGY PERFORMANCE

THE DIFFERENCE IS IN THE DETAIL

XO/UF

Fabric Energy Efficiency is based on 3 main principles:

1. U-Values
2. Thermal Bridging
3. Air tightness

What is Thermal Bridging?

Thermal Bridging occurs in small areas where the insulation level is reduced significantly, compared with the remainder of the element. They may be 'Repeating,' 'Random,' or 'Non-Repeating.'

How is Thermal Bridging measured?

Thermal bridges are calculated as a linear thermal transmittance value - PSI (Ψ) measured in W/mK. SAP is the software programme used to calculate a dwelling's energy rating. Within this software, Thermal Bridging through junctions is accounted for as a 'Y-Value.'

Thermal Bridging & Airtightness

A comparison between the Y-Value and a hole in the construction



Y= 0.20

The equivalent of an open 'Garage Door' 2.1m x 3.3m (6.93m²) opening.



Y= 0.08

The equivalent of an open 'Patio Door' 2.1m x 1.8m (3.78m²) opening.



Y= 0.03

The equivalent of an open 'Window' 1.25m x 1.25m (1.56m²) opening

Our innovative range of insulation products deliver the U-Value requirements to meet Passive standards and building regulations, but it's not just about U-Values any longer.

How the system builds, how it interconnects at junctions and how it is witnessed and confirmed on site is equally as important.

Good detailing delivers benefits:

- + More energy efficient building with lower running costs.
- + Less chance of condensation and mould forming at poorly detailed junctions.
- + A more cost effective method of achieving a low energy building.

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 polythene packs 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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FREE
One-to-one
advice



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ISO 45001 Occupational Health & Safety Management Systems

ISO 9001 Quality Management Systems

ISO 14001 Environmental Management Systems

The Sustainable Solution

Specifying Unilin Insulation is a real commitment to minimising energy consumption, harmful CO₂ 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 an 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 02 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.