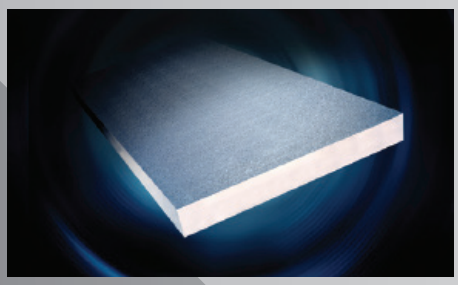
XtroLiner

Superior Performance PIR Insulation

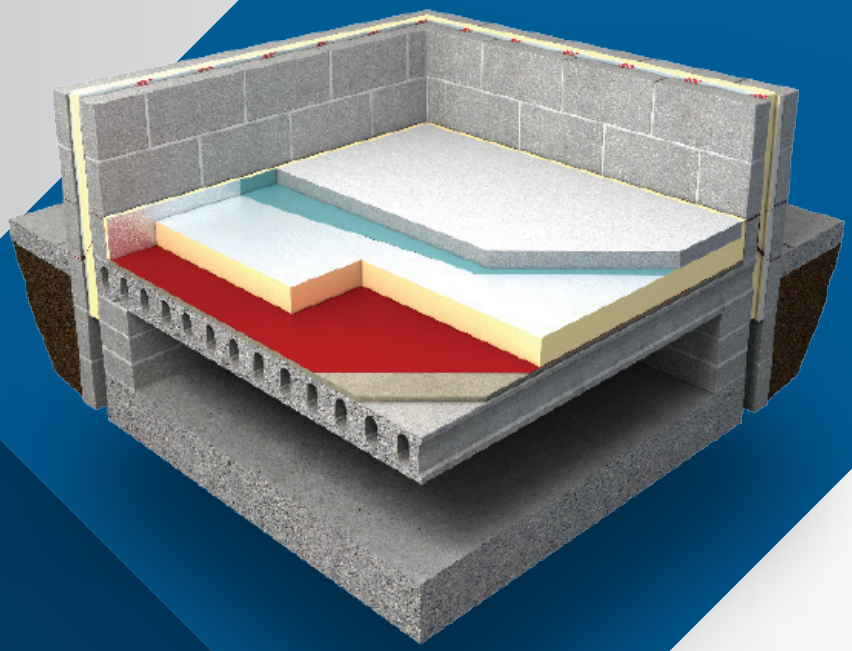
Innovative Products

Floors

XO/UF
Insulation for
Solid and Suspended Floors



XO21 Xtratherm



PLATINUM SERVICE

Xtratherm®
More than insulation

Data Sheet

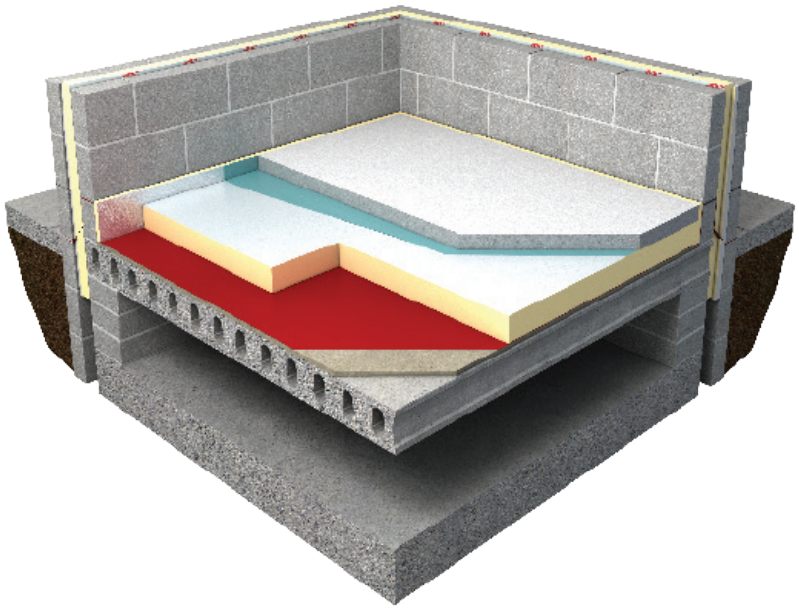
XtroLiner XO/UF

Superior Performance PIR Insulation

Insulation for Solid and Suspended Floors

XO/UF superior performance PIR offers excellent insulation performance with a thermal conductivity of 0.021 W/mK. The floor in any building is an area of considerable downward heat loss when not properly insulated.

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



Specification Clause

The floor insulation shall be Xtratherm XtroLiner XO/UF manufactured to EN 13165 by Xtratherm, comprising rigid modified Polyisocyanurate (PIR) core with textured robust low emissivity foil facings. The XO/UF _ _ _mm with Agrément certified 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 Xtratherm.

Xtratherm PIR achieves an A+ rating under the BRE Green Guide.

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

Thermal Resistances

Thickness (mm)	R-Value (m² K/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 Xtratherm 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 -> R-Value = 3.80. In accordance with EN 13165, R-values should be rounded down to the nearest 0.05 (m²K/W).

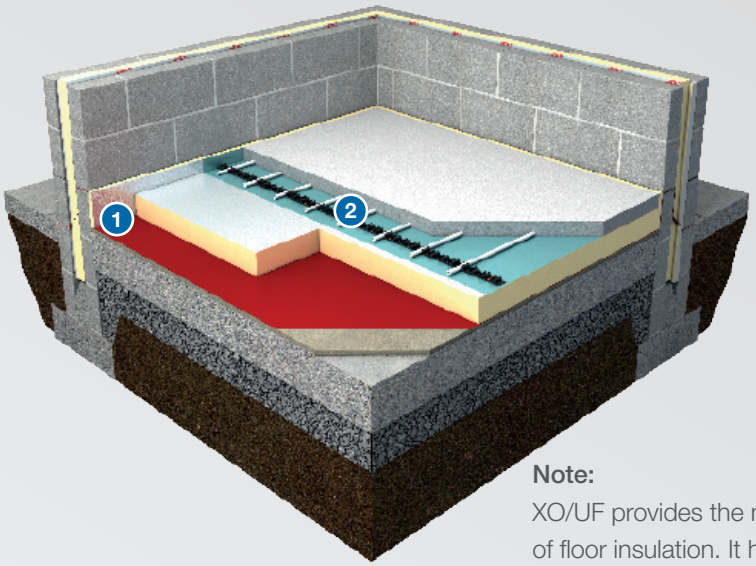
High Compressive Strength

Suitable for Underfloor Heating

Perimeter Strips for Robust Detailing

Reduced Insulation Thickness

Robust Textured Foil

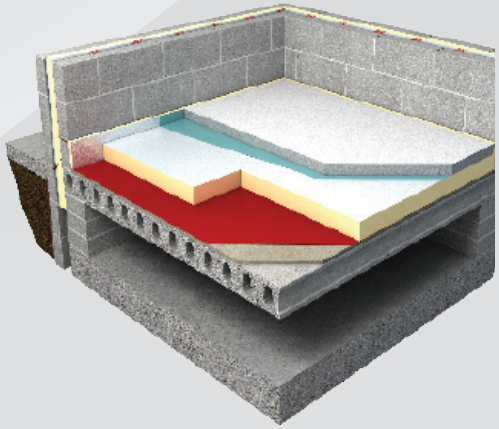


1

Good detailing at the wall/floor junction is essential to reduce thermal bridging. By placing an upstand of Xtratherm Perimeter strip (XO/STR) insulation 25mm thick around the external and internal wall/floor junctions, a robust detail is created.

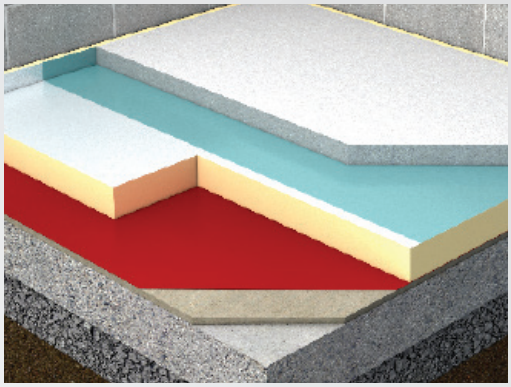
2

XO/UF is lightweight and suitable for use with underfloor heating. Thanks to its thickness to performance ratio, XO/UF allows for reduced insulation thickness. XO/UF 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:

XO/UF provides 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)	50, 60, 75, 80, 100, 120

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

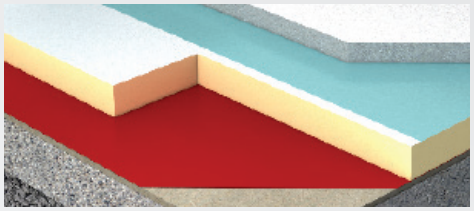
Property & Units	
Thermal Conductivity	0.021 (W/mK)
Compressive Strength	>150 (kPa)
Reaction to Fire	Euroclass C-s2, d0

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

Installation Guidelines

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.
4. Lay the XO/UF across the DPM. If two layers are required, lay the boards in a staggered jointed pattern. Closely butt all edges.
5. Place Xtratherm 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 XO/UF through the SL. 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.
4. Lay the XO/UF boards across the DPM. If two layers are required, lay the boards in a staggered jointed pattern. Closely butt all edges.
5. Place Xtratherm 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 XO/UF 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 XO/UF to size, allowing for variations in joist spacings.
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 XO/UF 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.

ACDs must be followed to ensure that installation is in accordance with current Building Regulations and accounted for in the energy calculation.

Handling, Cutting and Storage

Xtratherm 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.

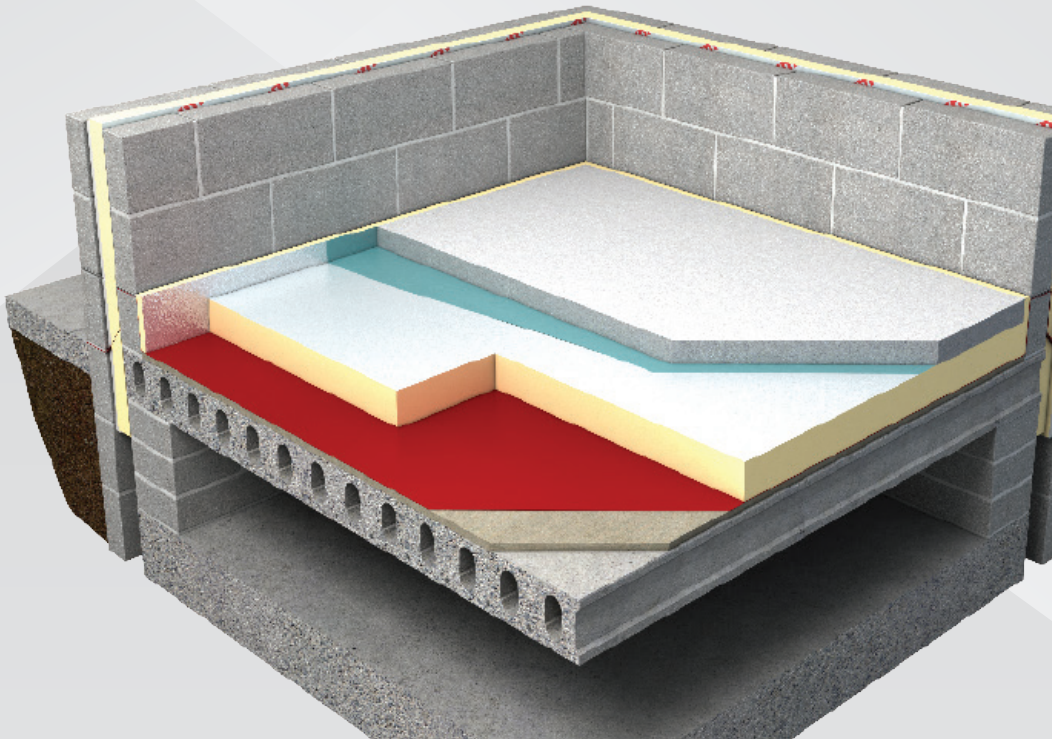
The insulation boards can be readily cut using a sharp knife or fine toothed saw. Ensure tight fitting of the insulation boards to achieve continuity of insulation as asked for within the ACDs. Appropriate PPE should be worn when handling insulation.

Please refer to H&S 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

Xtratherm products are stable, rot proof and will remain effective for the life span of the building, dependent 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.



Thermal Performance

Typical U-Values

Table 1

U-Value calculations to EN ISO:6946 for UK
XO/UF Insulation for Ground Supported slab

Build-up:

- 65mm screed
- Separating layer Polythene sheet
- Insulation with perimeter strips
- DPM 1200 gauge polythene or Radon Barrier
- Concrete slab

Perimeter/Area (P/A)

Thickness (mm)	0.5	0.6	0.7	0.8	0.9
50	0.23	0.25	0.25	0.26	0.27
60	0.21	0.22	0.23	0.23	0.24
75	0.18	0.19	0.20	0.20	0.20
80	0.18	0.18	0.19	0.19	0.19
100	0.15	0.15	0.16	0.16	0.16
120	0.13	0.14	0.14	0.14	0.14

Table 2

U-Value calculations to EN ISO:6946 for IRL
XO/UF Insulation for Ground Supported Slab

Build-up:

- 65mm screed
- Separating layer Polythene sheet
- Insulation with perimeter strips
- DPM 1200 gauge polythene or Radon Barrier
- Concrete slab

Perimeter/Area (P/A)

Thickness (mm)	0.5	0.6	0.7	0.8	0.9
50	0.26	0.27	0.27	0.28	0.28
60	0.23	0.24	0.24	0.25	0.25
75	0.20	0.20	0.21	0.21	0.21
80	0.19	0.19	0.20	0.20	0.20
100	0.16	0.16	0.17	0.17	0.17
120	0.14	0.14	0.14	0.14	0.15

Typical U-Values

CERTIFICATE CS/nnnn-n
U Value Competency Scheme

Table 3

U-Value calculations to EN ISO:6946 for UK
XO/UF Beam & Block Suspended Floor

Build-up:

- 65mm screed
- Separating layer Polythene sheet
- Insulation with perimeter strips
- DPM 1200 gauge polythene or Radon Barrier
- Beam and block suspended floor

Perimeter/Area (P/A)

Thickness (mm)	0.5	0.6	0.7	0.8	0.9
50	0.26	0.27	0.27	0.28	0.28
60	0.23	0.24	0.24	0.25	0.25
75	0.20	0.20	0.21	0.21	0.21
80	0.19	0.19	0.20	0.20	0.20
100	0.16	0.16	0.17	0.17	0.17
120	0.14	0.14	0.14	0.14	0.15

Table 4

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

Build-up:

- 65mm screed
- Separating layer Polythene sheet
- Insulation with perimeter strips
- DPM 1200 gauge polythene or Radon Barrier
- 150mm Suspended hollow core

Perimeter/Area (P/A)

Thickness (mm)	0.2	0.3	0.4	0.5	0.6	0.7	0.8	0.9	1.0	Target U-Value
Thickness (mm) U-Value	40	50	50	50	60	60	60	60	60	**0.25**
Thickness (mm) U-Value	50	60	60	70	70	70	70	70	70	**0.22**
Thickness (mm) U-Value	60	70	70	75	75	75	75	80	80	**0.20**
Thickness (mm) U-Value	90	100	100	110	110	110	110	110	110	**0.15**

Thermal Bridging

Fabric Energy Performance
The difference is in the detail

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 and DEAP are the software program used to calculate a dwelling's energy rating. Within this software, thermal bridging through junctions is accounted for as a 'Y-value.'

Thermal Bridging and Airtightness
A comparison between the Y-value and a hole in the construction

Y= 0.15

The equivalent of an open 'Garage Door' 2.1m x 3.3m (6.93m^2) opening.

Y= 0.08

The equivalent of an open 'Patio Door' 2.1m x 1.8m (3.78m^2) opening.

Y= 0.03

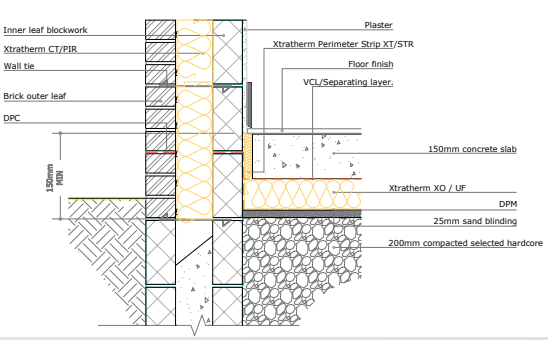
The equivalent of an open 'Window' 1.25m x 1.25m (1.56m^2) opening

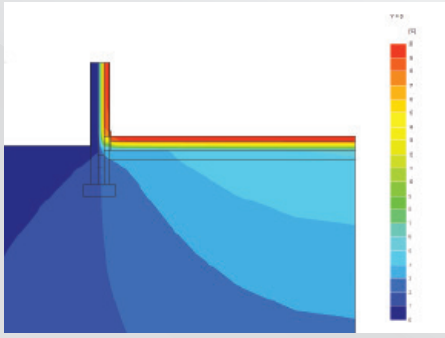
Our innovative range of insulation products deliver the U-Value requirements to meet Passive standards and building regulations, but it's not just about U-Values any longer.

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

To achieve good detailing, the Construction Details (ACDs) as per TGD Part L should be followed during the planning, design and build process.





Below we show a self build project (simplified to allow junctions to be identified). Lets look at how the specification needs to be improved to compensate for poor detailing.

Xtratherm PSI Values
Using Accredited Details

Accredited Details	Block Type	75mm PSI	100mm PSI
MCI-GF-01 (E5)	Dense 1.13	0.150	0.147
MCI-GF-01 (E5)	Med 0.46	0.063	0.061
MCI-GF-01 (E5)	Light 0.15	0.018	0.010
MCI-WD-02 (E2)	Dense 1.13	0.028	0.031
MCI-WD-02 (E2)	Med 0.46	0.028	0.031
MCI-WD-02 (E2)	Light 0.15	0.030	0.033
MCI-WD-05 (E4)	Dense 1.13	0.024	0.027
MCI-WD-05 (E4)	Med 0.46	0.024	0.028
MCI-WD-05 (E4)	Light 0.15	0.026	0.029
MCI-WD-04 (E3)	Dense 1.13	0.036	0.039
MCI-WD-04 (E3)	Med 0.46	0.036	0.039
MCI-WD-04 (E3)	Light 0.15	0.038	0.041
E16	Dense 1.13	0.055	0.047
E16	Med 0.46	0.050	0.044
E16	Light 0.15	0.040	0.036

Xtratherm PSI Values
Using Acceptable Details

Acceptable Details	Block Type	80mm PSI	100mm PSI	110mm PSI
1.01a GF	Dense 1.13	0.166	0.165	0.165
1.01b GF	Med 0.33	0.090	0.089	0.088
1.01b GF	Light 0.20	0.067	0.065	0.061
1.23.2 Lintel Close-R	Dense 1.13	0.002	0.003	0.004
1.23.2 Lintel Close-R	Med 0.33	0.000	0.002	0.003
1.25 Jamb Close-R	Dense 1.13	0.001	0.003	0.003
1.25 Jamb Close-R	Med 0.33	0.000	0.001	0.002
1.26 Sill Forward	Dense 1.13	0.035	0.027	0.025
1.26 Sill Forward	Med 0.33	0.031	0.025	0.024
1.27.1 Corner	Dense 1.13	0.051	0.045	0.043
1.27.1 Corner	Med 0.33	0.041	0.038	0.036

For further information on this topic: Xtratherm has published Thermal Bridging guidance, request your copy from our technical department. Further certificates are also available for download from our website.

Xtratherm has an extensive library of downloads available on our website.

These include the ACDs, BIM files, CAD drawings and Agrément certificates. Xtratherm also offers CPD training on thermal bridging as well as a wide variety of building regulation topics.

Brochures
—
Download brochures for all Xtratherm products.

Certs & DOPs
—
See facts & figures on how Xtratherm performs.

CPDs
—
Find out more about Xtratherm CPD offerings in the Xi Academy.

ACDs (PDF)
—
Download Xtratherm's Accredited/Acceptable Details for Construction (ACDs).

Packing Lists
—
Get size and dimension specifications

Education
—
Xtratherm have developed educational resources for secondary and third level colleges

ACDs (CAD)
—
Download CAD files of Xtratherm Products and Accessories.

BIM Files
—
Download BIM objects of Xtratherm Products and Accessories.

Sustainability
—
Find out more about Xtratherm's Corporate Sustainability Strategy

Expect More KNOWLEDGE

At Xtratherm we understand the importance of giving our customers the best technical advice.

We have taken the unique industry step of training every one of our technical team that deals directly with our customers, to the highest industry standards of competency in U-Value calculation and condensation risk analysis. We have Thermal Bridging covered also under the BRE/NSAI Thermal modelling competency scheme, using the most comprehensive 3D software available.

Our team and products are certified in the UK and Ireland and through the following certifications bodies:

- BRE Thermal bridging modelling competency certification
- NSAI Thermal modelling competency scheme
- TIMSA-BBA competency scheme for U-Value calculation and condensation risk analysis
- BBA and NSAI certification of the Xtratherm insulation boards
- SAP and DEAP energy assessment

Our technical team can also provide:

- Thermal calculations
- Technical advice on building regulations in the UK and Ireland
- Technical papers on a variety of topics
- Certified CPDs
- BIM modelling
- NBS Specifications
- Educational resources for technical secondary and tertiary colleges

Please refer to the Resources section of our website for more details

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The **Xtratherm** Innovation Centre

The Xtratherm exhibition space and training academy has been developed to assist construction professionals in understanding the principles of specifying and achieving on-site, best practice insulation standards for new dwellings, commercial envelope solutions and refurbishment projects.




Get in touch

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Thermal Calculations, Technical Advice or to arrange a technical visit:
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Xtratherm®
More than insulation

The Sustainable Solution
Specifying Xtratherm is a real commitment to minimising energy consumption, harmful CO^2 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.

The BRE Green Guide
The 2008 Green Guide to Specification produced by the BRE gives Xtratherm Insulation products a rating of A or A+. Green Guide ratings are used to gain credits in BREEAM (BRE Environmental Assessment Method) for non-residential buildings, and under 'Mat 4 – Insulation' the first credit requires the building to have an Insulation Index of 2 or greater – only achievable if the weighted average rating of the insulation is A or A+. This shows that all our products have been made with materials that have been responsibly sourced. The standard sets out organisational governance, supply chain management and environmental and social aspects that are verified and ensure responsible sourcing of materials.

Responsible Sourcing
Xtratherm 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.

Global Warming and Ozone Depletion
All Xtratherm Insulation products use CFC-and HCFC-free materials, and are manufactured using a blowing agent with a low GWP and zero ODP.

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 Xtratherm Technical Support. Xtratherm technical literature, Agrément certifications and Declarations of Performance are available for download on the Xtratherm 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 Xtratherm.

PLATINUM SERVICE

Specifying products supported by the Xtratherm Platinum Service gives you the highest level of assistance from design stage to delivery of real performance on site, through the assurance of a validation process from calculation to installation.

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ISO 9001 | Quality Management Systems

ISO 14001 | Environmental Management Systems

Xtratherm, part of UNILIN group.

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