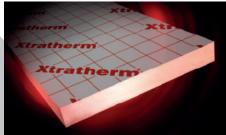
# Thin-R

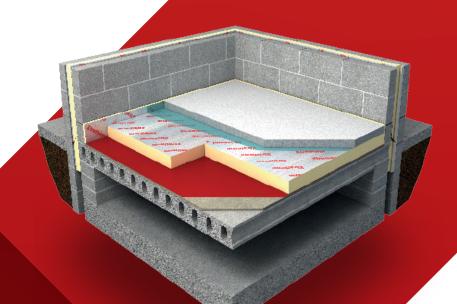
## PIR Insulation

## **Floors**

# XT/UF Insulation for Ground Supported and Suspended Floors







# Xtratherm<sup>®</sup> More than insulation





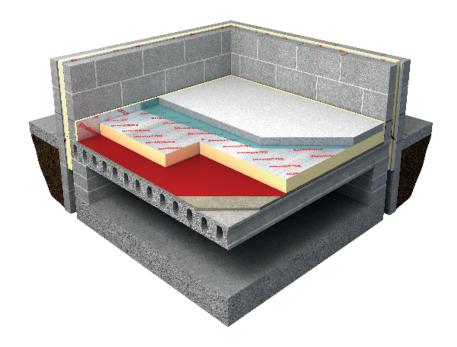


## XT/UF

Insulation for Ground Supported and Suspended Floors

The floor in any building is an area of considerable downward heat loss when not properly insulated. XT/UF will significantly improve the U-Value of new and existing floors.

Thin-R Underfloor XT/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
Thin-R XT/UF manufactured to EN 13165 by
Xtratherm, comprising a rigid Polyisocyanurate
(PIR) core between low emissivity foil facings.
The XT/UF\_\_\_mm with Agrément certified
Lambda value of 0.022 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, P10 250, P10 45



## **Thermal Resistances**

Thickness (mm)	R-Value (m <sup>2</sup> K/W)
25	1.10
30	1.35
40	1.80
50	2.25
60	2.70
70	3.15
90	4.05
100	4.50
110	5.00
125	5.65
150	6.80

#### 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 0.022 W/mk and thickness 50mm -> 0.050/ 0.022 -> R-Value = 2.25. In accordance with EN 13165, R-values should be rounded down to the nearest 0.05 (m² K/W).

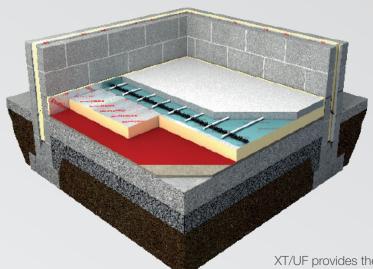
## High Compressive Strength

Suitable for Underfloor Heating

Perimeter Strips for Robust Detailing

Reduced Insulation Thickness

Low Emissivity Foil Facings

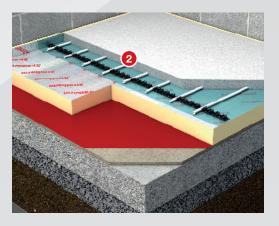


1

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

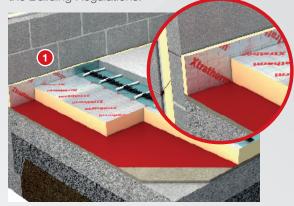
## 2

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



XT/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.

**Xtratherm** 



XT/UF	
Length (mm)	2400
Width (mm)	1200
Thickness (mm)	25, 30, 40, 50, 60, 70, 90, 100, 110, 125, 150

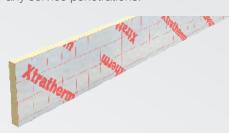
Other thicknesses may be available depending on minimum order quantity and lead time.

0.022 (W/mK)
>140 (kPa)
NPD

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

#### **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 XT/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 (XT/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 XT/UF 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.
- 4. Lay the XT/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 (XT/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 XT/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.
- Measure gaps between joists and cut XT/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 XT/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.

# 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 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.

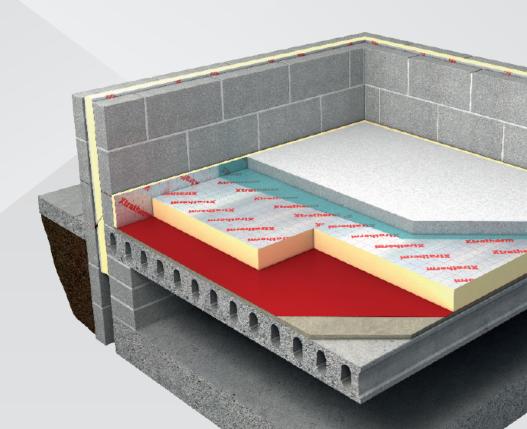
## **Xtratherm**





## **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.



## **Typical U-Values**



## Table 1

U-Value calculations to EN ISO:6946 for UK **XT/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 Ratio

	0.20	0.30	0.40	0.50	0.60	0.70	0.80	0.90	1.00	Target U-Value
Thickness (mm)	25	40	40	50	50	55	60	60	60	0.25
Thickness (mm)	30	50	60	60	70	70	70	70	70	0.22
Thickness (mm)	40	60	60	70	75	75	80	80	80	0.20
Thickness (mm)	70	90	100	110	110	110	120	120	120	0.15

## Table 2

## XT/UF IRL Insulation for Ground Supported Slab

## Perimeter/Area Ratio

	0.20	0.30	0.40	0.50	0.60	0.70	0.80	0.90	1.00	Target U-Value
Thickness (mm)	30	45	50	55	60	60	60	65	65	0.25
Thickness (mm)	40	55	60	65	70	70	75	75	75	0.22
Thickness (mm)	50	65	70	75	80	80	90	90	90	0.20
Thickness (mm)	80	100	110	110	120	120	120	125	125	0.15

## **Typical U-Values**



## Table 3

U-Value calculations to EN ISO:6946 for UK **XT/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 Ratio

	0.50	0.60	0.70	0.80	0.90	
50	0.27	0.28	0.28	0.29	0.29	
60	0.24	0.25	0.25	0.25	0.26	
75	0.21	0.21	0.21	0.22	0.22	
80	0.20	0.20	0.20	0.21	0.21	
100	0.17	0.17	0.17	0.17	0.18	
120	0.14	0.15	0.15	0.15	0.15	

## Table 4

Thickness (mm)

## XT/UF IRL Hollow Core Floor

## Suspended Hollow Core

- 65mm Screed
- Separating layer polythene sheet
- Insulation with perimeter strips
- DPM 1200 gauge polythene or radon barrier
- 150mm Suspended hollow core

## Perimeter/Area Ratio

	0.20	0.30	0.40	0.50	0.60	0.70	0.80	0.90	1.00	Target U-Value
Thickness (mm)	40	50	50	60	60	60	60	60	60	0.25
Thickness (mm)	50	60	70	70	70	70	70	75	75	0.22
Thickness (mm)	60	70	75	75	80	80	80	80	90	0.20
Thickness (mm)	90	100	110	110	120	120	120	120	120	0.15

## **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



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

Dedicated Technical Team:

UK: +44 (0) 371 222 1055 ROI: +353 (0) 46 906 6050 Thermal Calculations, Technical Advice or to arrange a technical visit: info@xtratherm.com



#### The Sustainable Solution

Specifying Xtratherm is a real commitment to minimising energy consumption, harmful CO<sup>2</sup> 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.

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## xtratherm.ie

ISO 9001 Quality Management Systems
ISO 14001 Environmental Management Systems









Xtratherm, part of UNILIN group.

# Thin-R

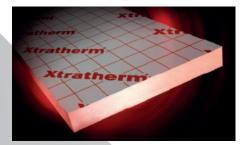
## PIR Insulation

## Roofs

## XT/PR

Insulation for Pitched Roofs







# Xtratherm<sup>®</sup> More than insulation







## XT/PR

Insulation for Pitched Roofs

Thin-R Pitched Roof XT/PR on sloped roofs (ventilated, hybrid or warm) provides the most efficient U-Values with minimal intrusion into valuable living space. The roof construction is a critical element in the building fabric and is an area at high risk of heat loss. Using XT/PR will reduce heat loss while also delivering excellent thermal bridging details.

Warm Roof construction is a particularly effective way of insulating complex roofs. Insulating above - or above and between - the roof timbers ensures that the structure is kept at or near the internal environmental conditions, reducing thermal stress and condensation risk.



## **Specification Clause**

The pitched roof insulation shall be Xtratherm Thin-R XT/PR manufactured to EN 13165 by Xtratherm, comprising a rigid Polyisocyanurate (PIR) core between low emissivity foil facings. The XT/PR\_\_\_mm with Agrément certified Lambda value of 0.022 W/mK to achieve a U-Value of \_\_\_W/m²K for the roof 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 P10 140, K11 695, K11 55, P10 15, P10 50



## Thermal Resistances

Thickness (mm)	R-Value (m <sup>2</sup> K/W)
25	1.10
30	1.35
40	1.80
50	2.25
60	2.70
70	3.15
75	3.40
80	3.60
90	4.05
100	4.50

## 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 0.022 W/mk and thickness 50mm -> 0.050/ 0.022 -> R-Value = 2.25. In accordance with EN 13165, R-values should be rounded down to the nearest 0.05 (m²K/W).

## Avoids Intrusion into Living Area

## **Xtratherm**

## Reduced Risk of Condensation

## Low Emissivity Foil Facings

## Lightweight and Easy to Install

## Reduced Thermal Bridging

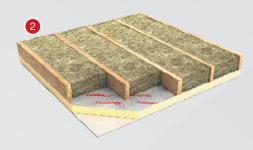
#### 1

In a conventional ventilated roof a 50mm clear ventilation gap should be maintained between the insulation and the roofing felt. In certain instances where a vapour permeable membrane is used instead of standard roofing felt, the ventilation gap may be dispensed with. Refer to manufacturer's guidelines.

#### Note

Alternatively, a layer of insulation - covered with chipboard - can also be placed over the joists. Xtratherm Walk-R offers a ready made solution for this application.





#### 2

In a ceiling, typically fibre glass is placed between and over the joists – this hides the top of the joist and may lead to health and safety concerns when the roof space is being accessed. The thermal bridge which occurs through the joists can be addressed by placing a layer of XT/PR to the underside, before the plasterboard is fixed. Xtratherm XT/TL Drylining boards can also be used. This allows for the roof space to be accessed in a safe manner leaving the top of the joists exposed, which allows the roof space to be used for storage.

XT/PR	
Length (mm)	2400
Width (mm)	1200
Thickness (mm)	25, 30, 40, 50, 60, 70, 80, 90, 100

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

Property & Units	
Thermal Conductivity	0.022 (W/mK)
Compressive Strength	>150 (kPa)
Reaction to Fire	NPD

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



"In every roof space where cold water tanks or other fitted appliances or services occur, the Contractor must construct a permanent boarded walkway from the roof access point to the tank ball valve position and / or the appliance location. This walkway should be supported above the first layer of insulation to prevent any compaction of insulation below the walkway."

#### **Ventilated Roof**

- Fix positioning battens to inner face of rafters, flush with the top edge of the timber.
- 2. Allow for ventilation gaps, normally 50mm. (May be reduced depending on breather membrane certification).
- 3. Cut boards with a fine toothed saw to fit tightly between rafters, flush with the bottom of the rafter. Allow slight oversize of cut to achieve 'friction fit' and seal any gaps with expanding foam.
- 4. An additional second layer is required, this should be fixed to the underside of the rafter. Run second layer transverse to the first with joints tightly butted. Fix with nails to hold insulation in place until plasterboard is installed.
- 5. Provide a separate vapour control layer between insulation and plasterboard or alternatively, tape the joints of the insulation with an aluminium foil tape.
- **6.** Finish with plasterboard fixed with drylining screws. Screw fix every 150mm, 12mm from edge of boards ensuring a minimum 30mm penetration into the rafter.

Alternatively the second layer can be achieved with XT/TL Xtratherm Drylining

**board.** Repeat steps 1 to 3 and replace second layer with XT/TL, a ready made PIR insulation board bonded to plasterboard. Where joints between sheets of XT/TL are unsupported by the rafters, timber noggins should be installed. Seal and tape the joints of the plasterboard in accordance with Standard Drylining Practice.

## **Hybrid Roof**

Follow the same procedure as a ventilated roof except an approved Vapour Permeable underlay is used above the rafter allowing the 50mm ventilation space to be dispensed with. Typically, a 25mm unventilated void is to be maintained; Agrément certification covering the membrane should be consulted.

#### Warm Roof

- 1. Ensure cavity wall insulation has continued to roof height to meet with the roof insulation.
- **2.** Fix a treated timber stop rail to the end of the rafter at the eaves.
- 3. Lay XT/PR staggered jointed over the rafters. Ensure joints are tightly butted and fill any gaps with expanding foam. Joints should be fully supported by rafters. Boards can be temporarily fixed with nails.
- 4. Fix 38mm x 50mm counter battens with approved fixings through the XT/PR into the rafter. The amount of fixings is determined by the fixing manufacturer who can also provide wind load calculations.
- 5. A breathable sarking membrane should be fitted; refer to manufacturer's Agrément certification. Ventilation may have to be provided subject to that certification and minimises the risk of interstitial condensation forming on the underside of the membrane. Providing an unventilated void under the membrane can improve the thermal performance.
- **6.** Secure 50mm x 25mm tiling battens through counterbatten and XT/PR to the rafter.
- 7. If an additional second layer is required, this should be fixed between the rafters.
- 8. Cut boards with a fine toothed saw to fit tightly between rafters, flush with the top of the rafter. Allow slight oversize of cut to achieve 'friction fit' and seal any gaps with expanding foam.
- Provide a separate vapour control layer between the bottom of rafter and plasterboard.
- 10. Finish with plasterboard fixed with drylining screws. Screw fix every 150mm, 12mm from edge of boards ensuring a minimum 30mm penetration into the rafter.

# 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 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.

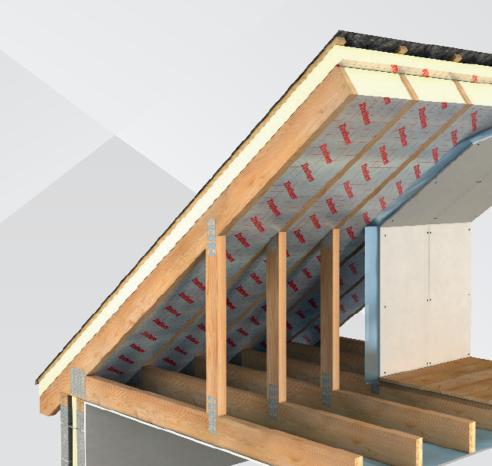
## **Xtratherm**





## **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.



## **Typical U-Values**

## Table 1

U-Value calculations to EN ISO:6946

XT/PR Insulation for Pitched Roofs



Hybrid Roof:

- Approved Breather Membrane 25mm Void
- XT/PR between Rafters
- XT/PR under Rafters to reduce thermal bridging
- Vapour Control Layer
- Plasterboard

### **Thin-R Thickness**

### **Rafter Centres**

Between	Under	600mm	400mm	
120mm	25mm*	0.17	0.18	
120mm	40mm*	0.15	0.16	
125mm	60mm*		0.13	
125mm	50mm*	0.13		

\* Insulation thickness only

## Table 2

U-Value calculations to EN ISO:6946 **XT/PR** Insulation for Pitched Roofs

Warm Roof:

- Breather Membrane
- XT/PR over Rafters to reduce
- thermal bridging
- XT/PR between Rafters
- Vapour Control
- Plasterboard

## **Thin-R Thickness**

## **Rafter Centres**

Between	Over	600mm	400mm
N/A	110mm	0.17	0.17
N/A	125mm	0.16	0.16
75mm	75mm	0.15	0.15
75mm	100mm	0.12	0.13

## **Expect More** KNOWLEDGE

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UK: +44 (0) 371 222 1055 ROI: +353 (0) 46 906 6050

Thermal Calculations, Technical Advice or to arrange a technical visit: info@xtratherm.com



#### The Sustainable Solution

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#### 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.

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ISO 9001 Quality Management Systems
ISO 14001 Environmental Management Systems









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