2011
VERSION 1 UK

Xtratherm®

High performance insulation boards.

Innovation -
delivering better performance

PRODUCT SPECIFICATION | INSTALLATION GUIDE

"I've worked with Xtratherm for years, they make innovative products that work."

www.xtratherm.com

Xtratherm®

Xtratherm manufactures high performance foil faced rigid thermal insulation - Polyisocyanurate (PIR)

energy

Contents:

Xtratherm rigid thermal insulation board out performs other materials in thickness to performance ratio. The high R-values achieved by Xtratherm Thin-R allows for highly efficient low energy design to new Building Regulation standards without the necessity to increase wall, floor or roof thickness.

Thin-R

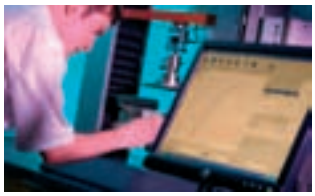
Rigid Thermal Insulation

Choosing the right insulation for your project is a vital step in creating a building which is comfortable, energy efficient and environmentally sustainable.

Xtratherm provides the construction industry with innovative solutions to meet the more stringent requirements of the Building Regulations and continues to develop solutions for future demands for energy efficient construction.

Xtratherm Thin-R® Polyiso is a high performance foil faced insulation that delivers twice the thermal performance of standard insulation materials, providing the builder/designer with maximum thermal performance with minimal intrusion into valuable living space. Xtratherm is manufactured under ISO 9001 assured quality systems.

www.xtratherm.com

The **Xtratherm Technical Support** team provide a single point of contact to offer comprehensive product advice and assistance on a wide range of issues for both the designer and builder.

efficient

Pitched Roof

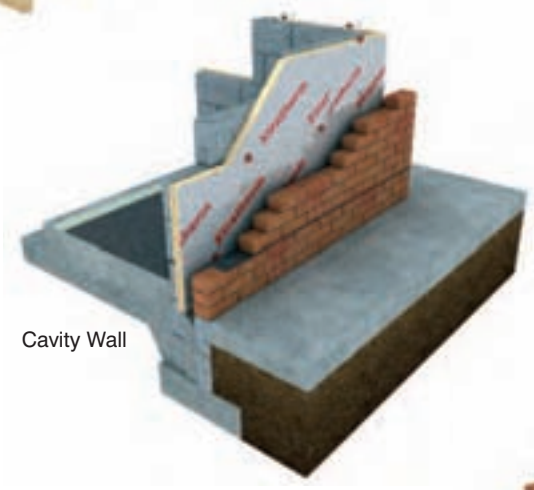
Recent changes to the Building Regulations and the introduction of the Code for Sustainable Homes in the UK aim to improve the energy efficiency of new buildings, and improve their impact on the environment.

All elements of a building need to work together to provide an Energy Efficient and compliant design. The starting point to achieve this goal is a very well insulated building fabric.

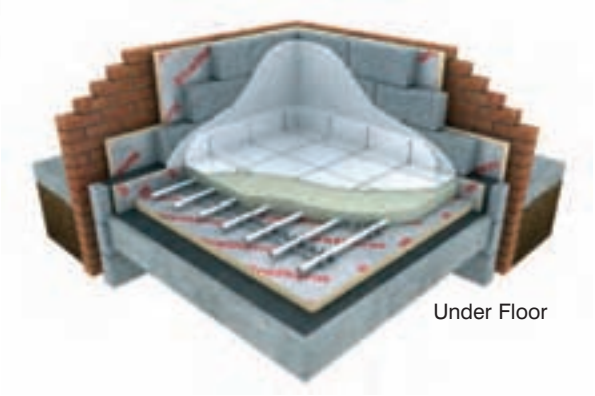
Xtratherm insulation, when built into walls, floors and roofs, can deliver outstanding thermal performance even within traditional building methods. Indeed, traditional build methods using **Xtratherm** can attain U-values in walls floors and roofs required to reach the zero-carbon goal.

At the same time as implementing the new Building Regulation amendments, the Energy Performance of Buildings Directive has been introduced, labelling buildings in much the same way electrical white goods are labelled at present.

Xtratherm best practice U-values and innovative detailing is the answer to achieving the higher energy label.



Cavity Wall



Under Floor

Thin-R® T&G

X022 Xtratherm®
ACHIEVING LOWER U-VALUES

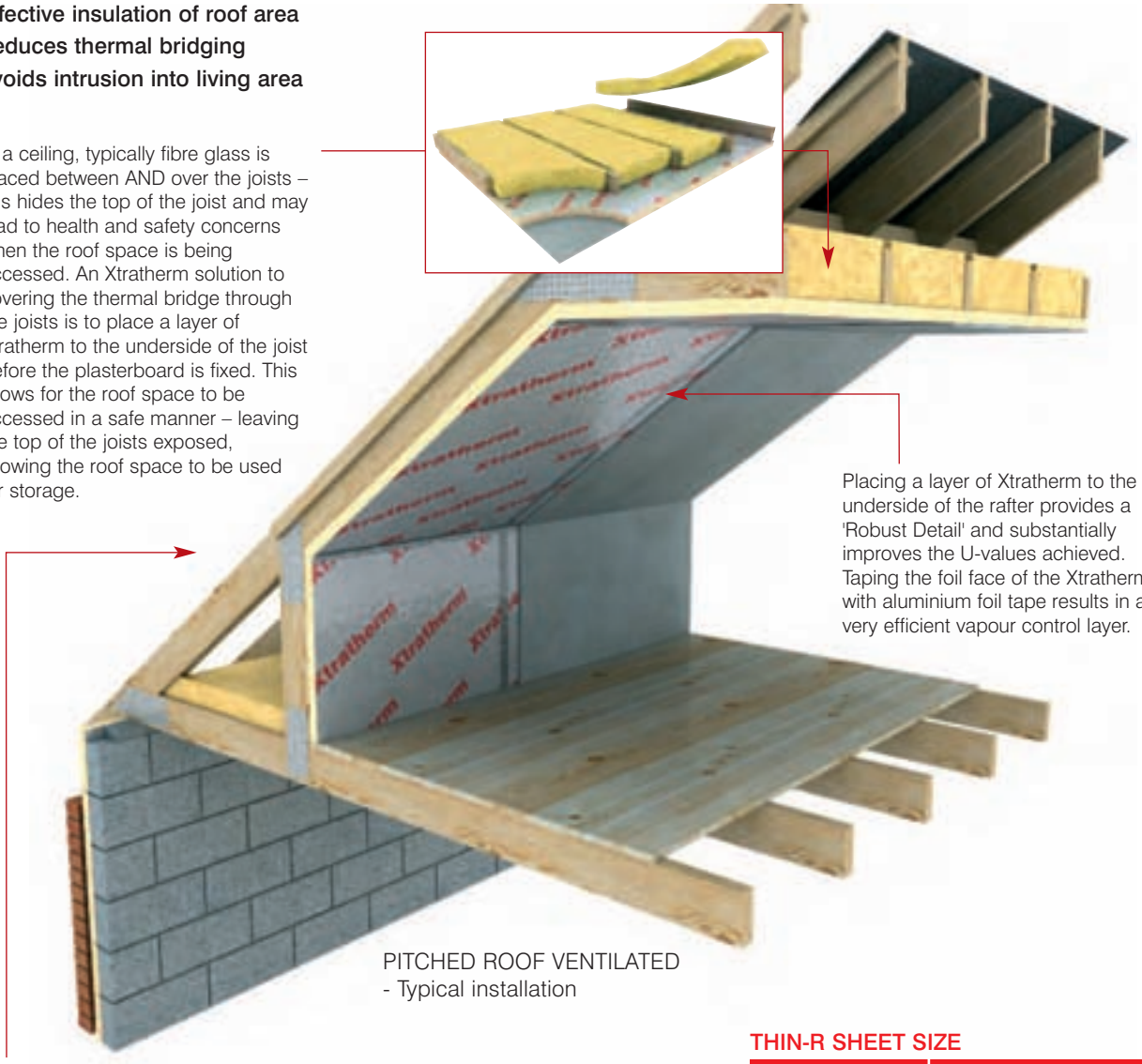
X022 Xtratherm®
ACHIEVING LOWER U-VALUES

Pitched Roof

Effective insulation of roof area
Reduces thermal bridging
Avoids intrusion into living area

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. An Xtratherm solution to covering the thermal bridge through the joists is to place a layer of Xtratherm to the underside of the joist before the plasterboard is fixed. This allows for the roof space to be accessed in a safe manner – leaving the top of the joists exposed, allowing the roof space to be used for storage.

Placing a layer of Xtratherm to the underside of the rafter provides a 'Robust Detail' and substantially improves the U-values achieved. Taping the foil face of the Xtratherm with aluminium foil tape results in a very efficient vapour control layer.



PITCHED ROOF VENTILATED
- Typical installation

In a conventional ventilated roof a 50mm clear ventilation gap should be maintained between the insulation and the roofing felt. In certain instances when a vapour permeable membrane is used instead of standard roofing felt, the ventilation gap may be dispensed with
(See Hybrid Roof Construction)

THIN-R SHEET SIZE

DIMENSIONS	SIZE (mm)
Length	2400
Width	1200
Thickness*	25/30/35/40/50/60/65/70/75/80/90/100/110*/120*/125*/140*/150*/165*

**Availability subject to quantity.*

TYPICAL PHYSICAL CHARACTERISTICS

PROPERTY	UNITS
Density (Foam Core)	30-32 Kg/m^3
Compressive Strength	>150 kPa
Water Vapour Resistivity	>100 MNs/gm
Thermal Conductivity	0.022 W/mK
Surface Spread of Flame	Class 1

Specification Clause

The pitched roof insulation shall be Xtratherm Thin-R XT/PR _ _ _mm thick manufactured to EN ISO 9001:2000 by Xtratherm. Comprising a CFC/HCFC free rigid Polyisocyanurate (PIR) core between low emissivity foil facings. The pitched roof insulation shall be installed in accordance with instructions issued by Xtratherm.
Refer to NBS clause P10 140, K11 695, K11 55

Thin-R XT/PR

Pitched Roof

Using Xtratherm on sloped roof areas can provide the most efficient U-values with minimal intrusion into valuable living space. **Warm Roof** construction is a particularly effective way of insulating complex roofs. Insulating 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.

Placing Xtratherm Thin-R between and/or below the rafter creates a **Ventilated Roof**. A continuous 50mm ventilation space is required between the insulation and the roof tile underlay to allow any moisture to be vented out of the construction. The high performance to thickness ratio of Xtratherm gives the maximum insulation values with minimal intrusion into the living area below.

The **Hybrid Roof** follows the same construction as the Vented Roof - but an approved Vapour Permeable underlay is used above the rafter allowing the 50mm ventilation space to be dispensed with. A 25mm unvented void should be maintained; Agrément certification covering the membrane should be consulted.

U-value calculations to BS EN ISO:6946

VENTILATED PITCHED ROOF (XT/PR, XT/TL-MF)

XTRATHERM THICKNESS BETWEEN RAFTERS AT 600MM CENTRES

XTRATHERM THICKNESS BELOW RAFTERS (mm)	40	50	60	70	75	80	90	100	125
0								0.28	0.23
25			0.28	0.26	0.25	0.24	0.22	0.21	0.18
30		0.29	0.27	0.24	0.23	0.23	0.21	0.20	0.17
35		0.27	0.25	0.23	0.22	0.21	0.20	0.19	0.16
40	0.28	0.26	0.24	0.22	0.21	0.20	0.19	0.18	0.16
45	0.27	0.24	0.22	0.21	0.20	0.19	0.18	0.17	0.15
50	0.25	0.23	0.21	0.20	0.19	0.19	0.18	0.17	0.15
55	0.24	0.22	0.20	0.19	0.18	0.18	0.17	0.16	0.14
60	0.22	0.21	0.19	0.18	0.18	0.17	0.16	0.15	0.14
65	0.21	0.20	0.19	0.17	0.17	0.16	0.16	0.15	0.13
70	0.20	0.19	0.18	0.17	0.16	0.16	0.15	0.14	0.13
75	0.19	0.18	0.17	0.16	0.16	0.15	0.15	0.14	0.12
80	0.19	0.17	0.16	0.16	0.15	0.15	0.14	0.13	0.12

WARM PITCHED ROOF (XT/PR)

XTRATHERM THICKNESS OVER RAFTERS AT 600MM CENTRES

XRTATHERM THICKNESS BETWEEN RAFTERS (mm)	40	50	60	70	75	80	90	100	125
0								0.19	0.16
50			0.19	0.17	0.17	0.16	0.15	0.14	0.12
60		0.19	0.18	0.16	0.16	0.15	0.14	0.13	0.12
70	0.20	0.18	0.17	0.16	0.15	0.15	0.14	0.13	0.11
75	0.19	0.18	0.16	0.15	0.15	0.14	0.13	0.13	0.11
90	0.18	0.16	0.15	0.14	0.14	0.13	0.12	0.12	0.10
100	0.17	0.15	0.14	0.13	0.13	0.13	0.12	0.11	0.10
125	0.15	0.14	0.13	0.12	0.12	0.11	0.11	0.10	0.09

Includes minimum 25mm service void below insulation. Fixings not accounted for.

Resistance 'R' Values

The resistance value of any thickness of Xtratherm PIR can be ascertained by simply dividing the thickness of the material (in metres) by it's declared lambda value 0.022 W/mk.
eg 50mm = 0.050/0.022 = R2.27

Installation Guidelines

Warm Roof

Ensure cavity wall insulation has continued to roof height to engage with roof insulation.

Fix a timber stop rail to end of rafter at eaves.

Lay Xtratherm insulation stagger jointed over rafters ensuring joints are supported by rafters.

Ensure boards are tightly butted fill any gaps with expanding foam.

A vapour permeable underlay should be fitted; refer to manufacturers BBA certification.

Providing an unvented void under the membrane can improve the thermal performance.

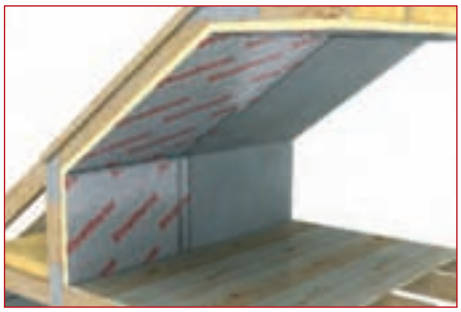
Fix counter batten with approved fixings.

Ventilation may have to be provided subject to certification.

A second layer of insulation may be added between the rafters.

Provide vapour control layer to underside.

Finish with 12.5mm plasterboard.



Ventilated Roof

Fix positioning battens to inner face of rafters.

Allow for ventilation gaps normally 50mm. (May be reduced depending on breather membrane certification).

Cut boards to fit tightly between rafters flush with rafter bottom.

Additional 2nd layer should be added to the rafter underside.

Run second layer transverse to the first.

Temporarily fix with nails.

Provide vapour control layer *(Aluminium tape joints).*

Finish with 12.5mm plasterboard fixed with drylining screws.

Screw fix every 150mm, 12mm from edge of boards.

All board edges should be supported.

X022 Xtratherm®
ACHIEVING LOWER U-VALUES

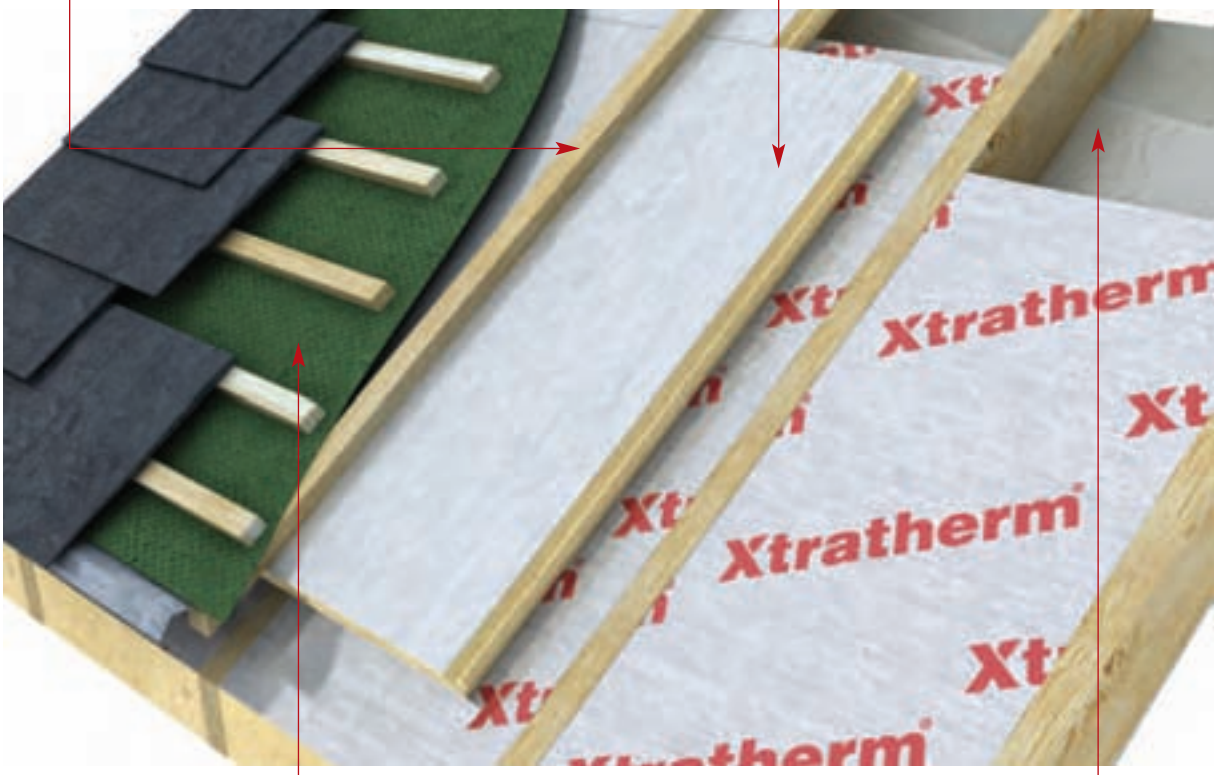
Xtratherm Sarking Warm Roof Insulation

Design

Using Xtratherm on sloped roof areas can provide the most efficient U-values with minimal intrusion into valuable living space. Warm Roof construction is a particularly effective way of insulating complex roofs. Insulating above the roof timbers ensures that the structure is kept at, or near the internal environmental conditions, reducing thermal stress and condensation risk. The Xtratherm Sarking Board XT/SK is a robust T&G engineered jointed board that achieves excellent U-values at minimal thicknesses. An additional layer of Xtratherm between the counterbattens minimizes fixing length.

The counterbatten is placed over the Xtratherm XT/SK and secured with approved helical fixings to manufacturers recommendations. The counterbatten carries the tiling battens.

Xtratherm XT/SK Tongued and Grooved sarking board is specifically engineered to provide a robust solution to insulating over rafters.



Warm roof constructions require the use of a vapour permeable underlay (Breather Membrane). Refer to manufacturers BBA certificate.

It is recommended that all roofs using a breather type membrane have an efficient vapour control layer to the under side in accordance with GBG 37 *Insulating roofs at rafter level: sarking insulation*.

- **High Thermal Performance**
- **Super-efficient U-value in roofs**
- **Effective Thermal bridging detailing**
- **Fully engineered jointing system**
- **Avoids thermal stress in roofs**

XTRATHERM SARKING T&G SIZE

DIMENSIONS	SIZE (mm)
Length	2400
Width	1200
Thickness	50/75/100

Other sizes are available subject to quantity and lead time.

Xtratherm Sarking XT/SK

Xtratherm XT/SK range is CFC/HCFC free (Zero Ozone Depletion Potential)

High Performance Warm Roof Sarking insulation

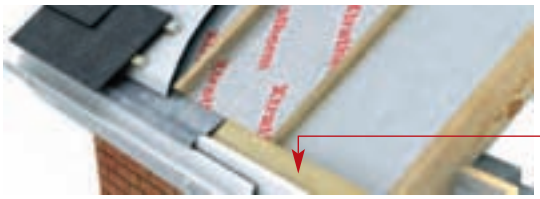
Xtratherm Sarking XT/SK is the most effective solution to insulating roofs to reach the very efficient U-values required to achieve zero carbon targets.

Creating a 'Warm Roof' allows complex roofs to be more effectively insulated with a reduced risk of thermal bridging and condensation problems as the roofing timbers are kept at or near internal environmental conditions.

Description

Xtratherm Sarking Boards XT/SK are for use in constructions where the ceiling follows the pitch of the roof and encloses a habitable space, or where the ceiling is horizontal and encloses a loft space.

Xtratherm Sarking Boards are placed over rafters with additional insulation added between rafters and/or between the counterbattens, in a double or triple layer system. The system is used in conjunction with an approved vapour permeable roof tile underlay, treated timber counter battens and vapour control layer on pitched and mansard roofs, which have been designed in accordance with the relevant clauses of BS 5534 Part 1.



A timber stop rail is fixed to the bottom of the rafters

Installation Guidelines

A treated timber stop rail, the same thickness as the Xtratherm Sarking Insulation, is fixed to the rafters close to the eaves to provide a firm fixing point for the counter battens. The Xtratherm Sarking boards are laid over the rafters commencing at the stop rail, the Tongued and Grooved edges of the boards should be fully engaged and positioned in a staggered pattern over the rafters. Repeat the procedure using crawling boards until the entire area from eaves to ridge has been covered. The insulation will not support operatives. Any gaps in the insulation (e.g. at the eaves, ridge, valleys and around any roof lights etc.) must be sealed with flexible sealant or expanding foam. Accredited Detailing must be followed. Use large headed clout nails to hold boards temporarily in place until they are secured by the counter battens.

Treated counterbattens are fixed through the insulation into the rafter with Helifix Inskew (or other approved) fixings at the appropriate centres, taking account of the specific roof design e.g. pitch, weight of slates/tiles and location of the building etc - contact supplier for specification/calculations.

A vapour permeable roof tile underlay should be installed (fully supported or over the counterbattens) depending on the type and in accordance with the certification. However, using the underlay over the counterbattens ensures better thermal performance from the Xtratherm Thin-R insulation. Slating or tiling is installed in accordance with the relevant clauses of BS 5534 Part 1: 1997. When the roof space is to be used as a living area, the Xtratherm Thin-R boards should be covered with 12.5mm plasterboard.

TYPICAL PHYSICAL CHARACTERISTICS

PROPERTY	UNITS
Density (Foam Core)	30 Kg/m³
Compressive Strength	>140 kPa @ 10%
Thermal Conductivity	0.022 W/mK
Service Temperature	-20°C - +100°C

U- VALUES

XT/SK U-values achieved			
Sarking Over (mm)			
	60mm Between rafters	75mm Between rafters	100mm Between rafters
50	0.19	0.18	0.15
3rd layer @ 40mm	0.15	0.14	0.12
60	0.18	0.16	0.14
3rd layer @ 40mm	0.14	0.13	0.12
70	0.17	0.15	0.13
3rd layer @ 40mm	0.13	0.12	0.11

Rafters taken at 600mm centres.

Additional Layers

Xtratherm Thin-R pitched roof insulation can used to create a double or triple layer system when the U-value requirement create an excessive thickness for a single layer application, or overall thickness needs to be reduced at the eaves detail. Ideally the thicknesses between and over the rafters should be of similar depth.

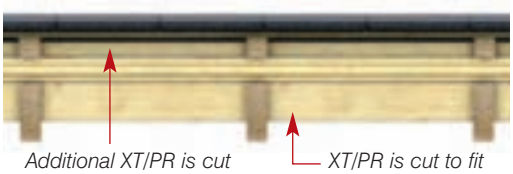
XT/PR is cut to fit tightly between rafters

2 Layer System

A second layer of Xtratherm XT/PR insulation is cut to size and placed between the rafters on timber batten carriers or sarking clips that are nailed up the slope of the roof. The upper face of the board should be kept flush with the top of the rafter.

3 Layer System

Placing Xtratherm XT/PR insulation (Typically 40mm) between the counterbattens futher improves the U-value achieved and minimizes the length of fixings that are required to fix the counterbattens.



Additional XT/PR is cut to fit tightly between counter battens

XT/PR is cut to fit tightly between rafters

Note: During the drying out period after construction, additional ventilation may be required to prevent interstitial condensation. Refer to Building Research Advisory Service (BRAS) Til 59.

X022 Xtratherm®
ACHIEVING LOWER U-VALUES

Xtratherm Loft Walk-R

Xtratherm Loft Walk-R is a laminate of high performance PIR insulation with tough moisture resistant chipboard that builds to allow safe access into insulated roof spaces whilst maintaining very high insulation values, and complying with health and safety guidelines.

There is a growing awareness of the benefits of upgrading the energy efficiency of our homes by installing energy efficient measures. One of the easiest and most cost effective measures to take is to insulate the roof space, but consideration must be given to safe access to that roof space once the upgrade has taken place.

Providing for access to tanks, services and fittings in the roof space.
"Because the depth of insulation will obscure the location of ceiling joists, provision should be made for access from the access hatch to the cold water tank and other fittings to which access for occasional maintenance and servicing may be required."

Xtratherm Walk-R is the solution for high performance lofts - with safe access.

Existing loft space - insulation between joists only	
Energy Efficient?	No
Safe Access?	?

Upgraded loft space - 2nd layer of insulation over joists	
Energy Efficient?	Yes
Safe Access?	No

Upgraded loft space - 2nd layer of insulation over joists plus Loft Walk-R access	
Energy Efficient?	Yes
Safe Access?	Yes

- Achieves better than 0.16W/m²K target
- T&G jointing long edges
- Superior compressive strength

Application

Xtratherm Loft Walk-R has been developed to provide insulated decking for lofts to allow for maintenance access and storage in roof space areas.

The moisture resistant chipboard is tongued and grooved along the long edge for easy jointing.

Boards should be laid transverse to the joists, (spanning minimum of 4 joists at 400mm centres). Pre-drill the Walk-R panels and secure with wood screws. Screws should penetrate joists by 30mm and be placed no closer than 25mm from any panel corner.

Ensure that no electrical cables are damaged or compressed between the Walk-R panels and the joists. Mark the top of the panels to indicate the positioning of any services below the walkway. Do not over-tighten the screws.

Ceiling joists are not designed to take a floor loading, loads applied should not be excessive. If loading other than maintenance traffic or light storage is required an engineer should be consulted.

Product Data	Joist depth fully filled with fibre insulation
Length	1200mm T&G
Width	600mm SE
Thickness PIR	75mm
Thickness Chipboard	18mm
Thermal Conductivity*	0.022
Compressive Strength*	>120kPa
Tolerance: Length	+/- 7.5mm
Width	+/- 5mm
Thickness	+/- 4mm

** Insulation component only*

Xtratherm Loft Walk-R sheets per pallet	20

U-values (w/m²K) achieved with 93mm Xtratherm Loft Walk-R			
	Joist depth fully filled with fibre insulation		
	100mm	150mm	225mm
U-value achieved	0.17	0.14	0.12

Access & Specifications Guidelines

"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."

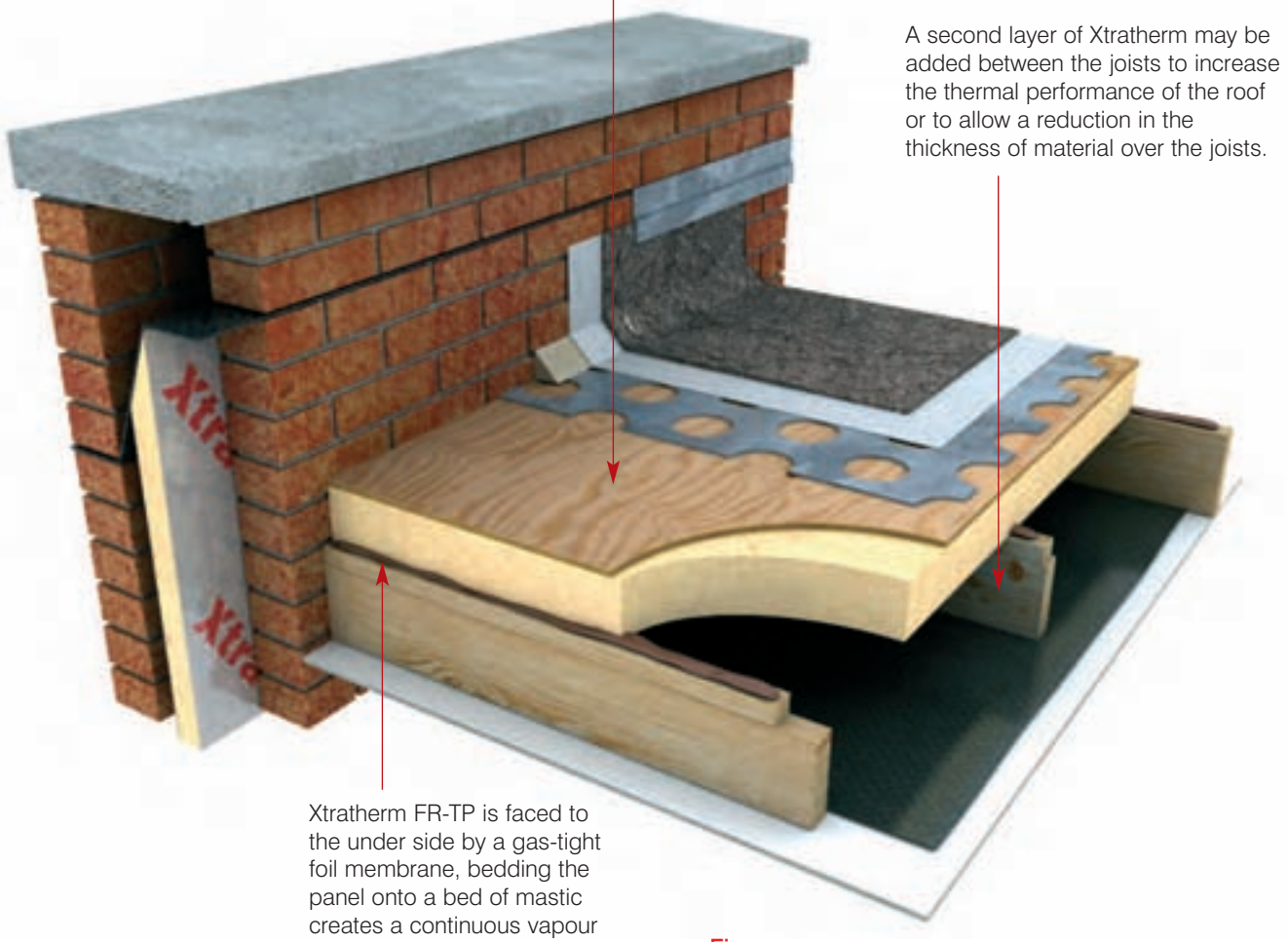
Flat Roof Board FR-TP

Thermal Ply

- **Insulation & decking in one fix**
- **For new & refurbishment roofs**
- **Rapid weather proofing**

The Xtratherm FR-TP provides a high level of thermal insulation and decking in one application.

A second layer of Xtratherm may be added between the joists to increase the thermal performance of the roof or to allow a reduction in the thickness of material over the joists.



Xtratherm FR-TP is faced to the under side by a gas-tight foil membrane, bedding the panel onto a bed of mastic creates a continuous vapour control layer.

FLAT ROOF - Typical installation

Fire

The fire rating when tested to BS 476 Part 3: 2004 'External Fire Exposure Roof Test' will be dependent upon waterproofing system specified.

XTRATHERM FR-TP SHEET SIZE

DIMENSIONS	SIZE (mm)
Length	2400
Width	1200
Thickness*	56/76/86/96/106/116

**Thickness includes 6mm plywood*

Xtratherm FR-TP

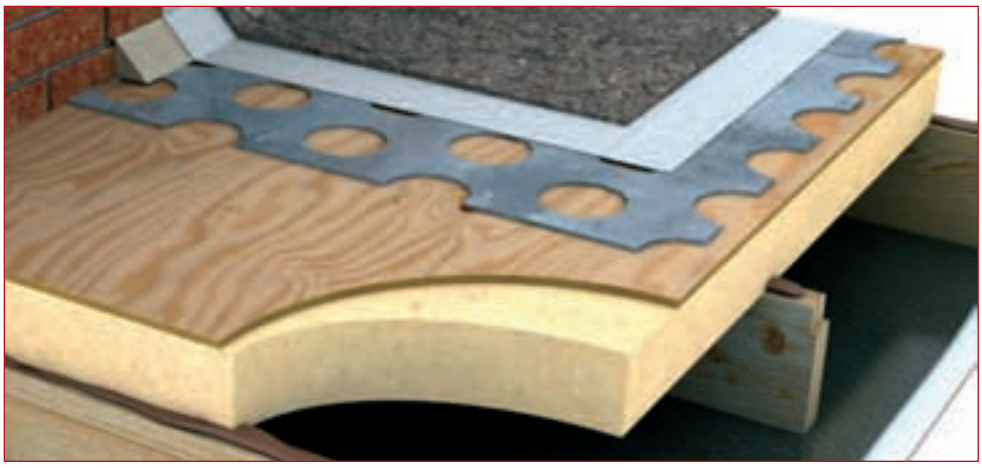
Xtratherm XT/FR product range is CFC/HCFC free
(Zero Ozone Depletion Potential)

TYPICAL PHYSICAL CHARACTERISTICS

PROPERTY	UNITS
Density (Foam Core)	32 Kg/m³
Compressive Strength	>150 kPa
Water Vapour Resistivity	>100 MNs/gm
Thermal Conductivity	0.022 W/mK

Flat Roof

Xtratherm Thin-R Thermal Ply is a composite insulated panel of Xtratherm Polyisocyanurate core with a composite foil face, bonded to 6mm WBP grade plywood. Thin-R FR-TP is designed to provide high levels of thermal insulation and decking in one operation for new and refurbishment flat roof applications.



Installation Guidelines

Flat Roof Insulation

Xtratherm Thin-R FR-TP should be fixed to minimum 50mm thick joists at 600mm centres max. with the plywood uppermost.

Boards should be staggered and butted with a 2mm gap between board, each edge should have a minimum bearing of 20mm on joist.

All edges should be supported - add noggings where necessary. Stagger fixings where boards are butted.

Boards should be embedded in vapour resistant mastic to provide a vapour control layer in conjunction with foil facing.

Mastic should be laid wide enough to facilitate 2 panel edges and be continuous around all edges.

Thin-R FR-TP should be fixed with low profile screw fixings, placed at 200mm centres around the perimeter of the boards and at 300mm centres along any intermediate supports.

All fixings should penetrate the joists by a minimum of 35mm and be placed 12mm from the edge of the Thin-R FR-TP, and no further than 50mm from any corners.

Care should be taken to ensure that the heads of any fixings are flush with the plywood surface and not over-driven.

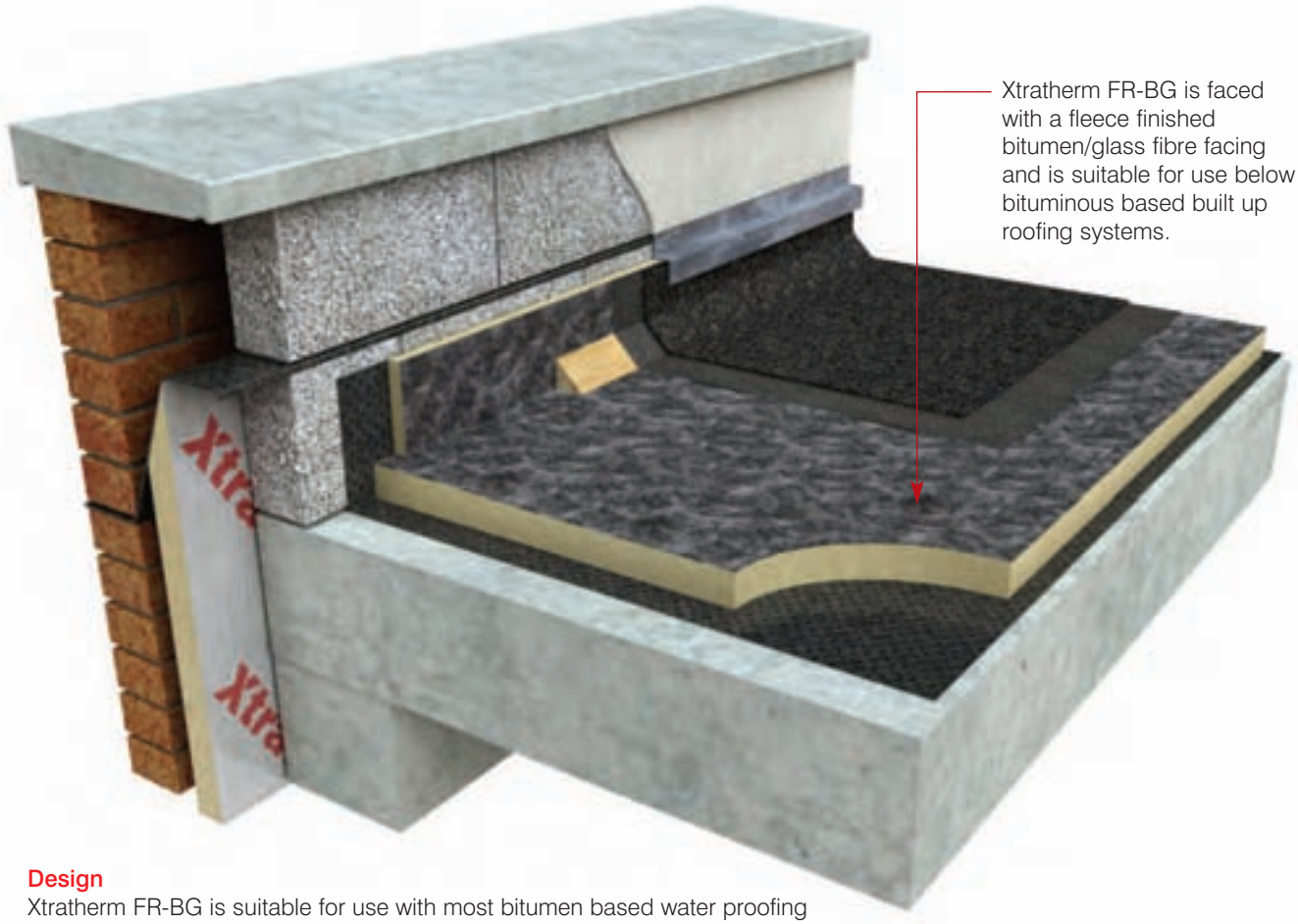
The roof should be fire protected to the underside by plasterboard or other approved material.

Thin-R FR-TP is suitable for maintenance traffic loadings only.

Flat Roof Board FR-BG

Built up roofing system

- High Thermal Performance
- Compatible with most bituminous based roofing systems
- Fleece finished bitumen/glass fibre facing



Design
Xtratherm FR-BG is suitable for use with most bitumen based water proofing systems including those using a BS747 type 3G perforated base layer. The roof should be laid in accordance with BS 8217: 2005 (Reinforced bitumen membranes for roofing. Code of practice). During the construction process, the construction should be protected from rain penetration during breaks in the process.

Falls
The fall on a flat roof should be designed to ensure that rainfall does not pond. Care must be taken to provide adequate falls i.e. 1 in 80.

Roof Loading
Xtratherm FR-BG is suitable for use on roof decks that are subject to limited maintenance foot traffic. Walkways should be provided on roofs requiring regular pedestrian access. When the roof is complete, protective boarding should be laid if additional sitework is to be carried out.

Roof finish
Built up roofing systems should be finished with a suitable reflective layer such as chippings.

Fire Performance
Built-up roofs using Xtratherm FR-BG as part of a 3 layer system with mineral chippings on the cap sheet will attain an FAA rating when tested to BS476, Part 3: 1988 external fire exposure roof test.

XTRATHERM FR-BG SHEET SIZE

DIMENSIONS	SIZE (mm)
Length	1200
Width	600
Thickness	50/60/70*/80/100/120*

**Subject to quantity and lead time.*

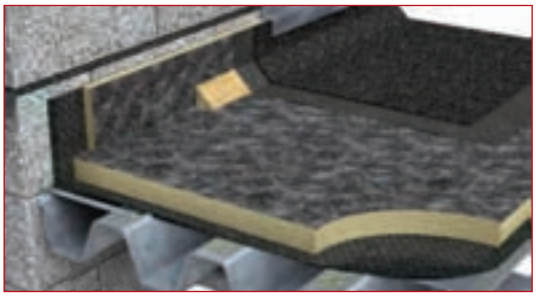
Xtratherm FR-BG

Xtratherm XT/FR product range is CFC/HCFC free
(Zero Ozone Depletion Potential)

Flat Roof FR-BG

Xtratherm FR-BG is faced with a fleece finished bitumen/glass facers and is suitable for use below partially bonded bitumen based built up roofing systems.

Note: FR-BG can aso be used in mechanically fastened or loose laid ballasted bituminous roofing systems.



TYPICAL PHYSICAL CHARACTERISTICS

PROPERTY	UNITS
Density (Foam Core)	30 Kg/m³
Compressive Strength	>150 kPa @ 10%
Water Vapour Resistivity	>100 MNs/gm
Thermal Conductivity*	0.026 - 0.027 W/mK
Service Temperature	-20°C - +100°C
Surface Spread of Flame	Class 1

**Thermal conductivity is dependent on facings and product thickness.*

SPANNING

Xtratherm FR-BG insulation boards laid over metal decks should be in accordance with BS 4841: Part 3		
FR-BG	TROUGH OPENING (mm)	
25		75
30	>75	100
40	>125	150
50	>175	200

TYPICAL 'U' VALUES

Xtratherm FR-BG Over Concrete Deck	
FR-BG (mm)	U-Value (W/m²K)
80	0.28
100	0.23
60+60 (120)	0.19
60+80 (140)	0.16

Installation Guidelines

Flat Roof Insulation

Vapour Control Layer

Decks should be primed before the application of the hot bitumen used to bond the vapour control layer. Reference should be made to BS8217:1994 when applying the vapour control layer. Carry the VCL past the insulation and seal with the parapet wall.

Laying - Metal Deck

On metal decks, Xtratherm FR-BG should be laid break bonded into hot bitumen (max temperature 240°C) mopped or poured over the vapour control layer. The board can also be mechanically fixed. Ensure all edges of the boards are supported.

Laying - Concrete Deck

Ensure concrete decks are laid to provide correct falls to outlets and are clean, dry, without any projections. Primer should be laid in accordance with the manufacturer's instructions. The vapour control layer should be fully bonded to the deck and the Xtratherm FR-BG should be laid into hot bitumen on the vapour control layer in separate bonded pattern. The boards can also be mechanically fixed.

Laying - Plywood Deck

On plywood decks, Xtratherm FR-BG should be fully bedded in hot bitumen over a continuous vapour control layer which has been nailed or bonded to the deck. The boards can also be mechanically fixed, fixing heads should be sealed with bitumen.

Fixing

The specification for fixing of Xtratherm roof boards will vary with the location, roof height/width and topographical data, architectural specification should be consulted. Generally with 1200x600 boards, a minimum of 4 fixings are adequate, located between 50mm and 150mm from all edges, additional fixings may be placed along the centre line. Counter sunk washers, 50mm in diameter should be used with each fixing. However, BS6399 Part 2 1995 should always be consulted. In two layer systems, all layers should be fixed in accordance with the contained instructions.

Bitumen Based Built Up Roofing Systems

Technical guidance from the appropriate bitumen waterproofing manufacturer should be sought as to assure proper installation of the bonded BUR system.

Fire

Each contract should be assessed for suitability of torch on applications. The suitability of materials, substrates and specifications should be assessed before commencement. Application of the torch on system should be undertaken only by fully trained personnel with appropriate fire precautions and fire extinguishing equipment available at hand. All timber roof components, and most insulations materials are combustible, and will be vulnerable to naked flame, these materials may be hidden from view, due attention should be given all precautions taken. This is the responsibility of the operatives.

X022 Xtratherm®
ACHIEVING LOWER U-VALUES

Flat Roof Board FR-ALU

Single Ply Mechanically Fixed

- High Thermal Performance
- Compatible with - mechanically fixed single ply systems. - Loose laid ballasted systems
- Vapour resistant foil facers

XTRATHERM FR-ALU SHEET SIZE

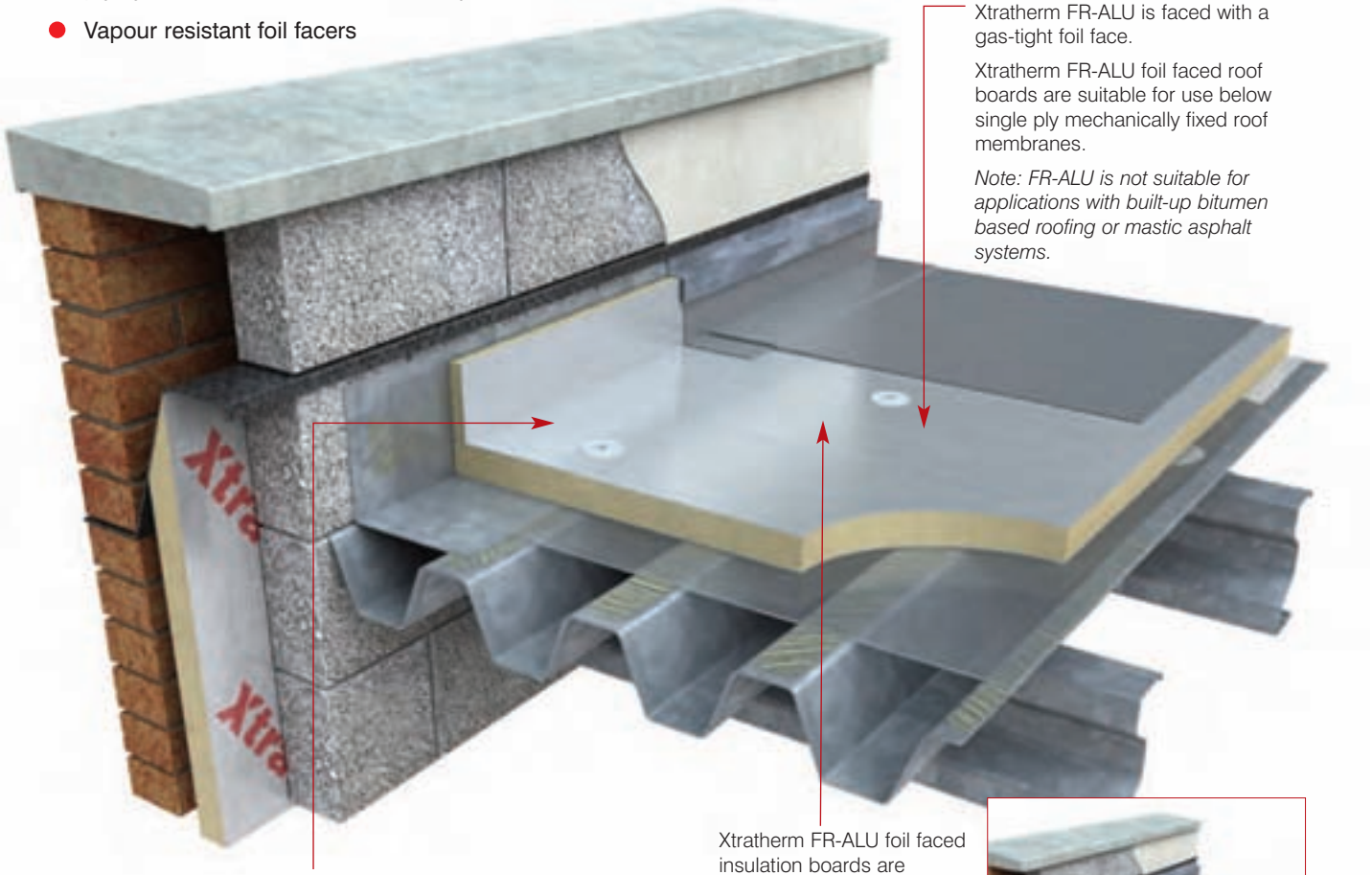
DIMENSIONS	SIZE (mm)
Length	2400
Width	1200
Thickness	25/50/60/70/75/80 100/105/120

Other sizes are available subject to quantity and lead time.

Xtratherm FR-ALU is faced with a gas-tight foil face.

Xtratherm FR-ALU foil faced roof boards are suitable for use below single ply mechanically fixed roof membranes.

Note: FR-ALU is not suitable for applications with built-up bitumen based roofing or mastic asphalt systems.

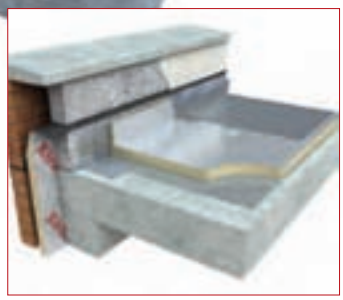


Xtratherm FR-ALU insulation boards should be laid over the vapour control layer in a break bonded pattern. The long edges of the boards should be laid at right angles to the corrugations and all board joints must be fully supported by the deck. The FR-ALU insulation boards are secured by approved mechanical fixings.

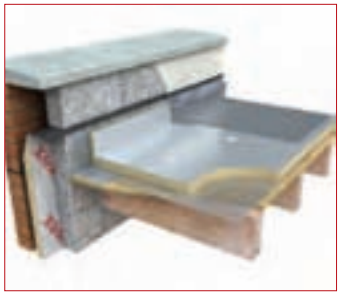
The requirement for a separate water vapour control layer should be assessed in accordance with BS6229 2003. When a vapour control layer is necessary, 1000 gauge polythene should be used. Any fixings that penetrate it must be of the self sealing type that fuse to the vapour control layer during applications.

Roof Finishes: Consideration should be given to the recommendations of BS4841: Part 3 2006 and those of the Single Ply Roofing Association.

Xtratherm FR-ALU foil faced insulation boards are suitable for use on roof decks that are subject to maintenance traffic. Walk ways should be provided on roofs requiring regular pedestrian access. When the roof is complete, protective boarding should be laid if additional site work is to be carried out. The completed roof should not be used for storage of heavy materials or air conditioning plant.



Typical installation - Concrete Deck



Typical installation - Timber Deck

Falls: The fall on a flat roof should be constant and steep enough to ensure that rainfall does not pond. Care must be taken to provide adequate falls ie not less than 1-80 to rain water outlets.

Fire: The fire rating when tested to BS 476 Part 3: 2004 'External Fire Exposure Roof Test' will be dependent upon waterproofing system specified. Xtratherm FR-ALU will typically achieve FAB rating.

FLAT ROOF - Typical installation (Metal Deck)

Xtratherm FR-ALU

Xtratherm XT/FR product range is CFC/HCFC free
(Zero Ozone Depletion Potential)

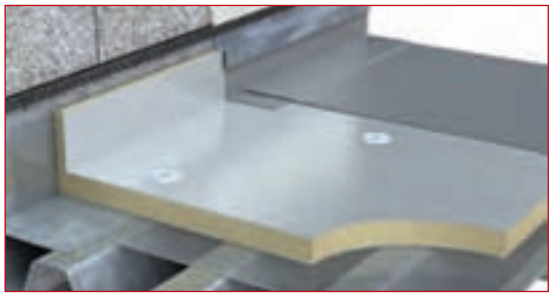
TYPICAL PHYSICAL CHARACTERISTICS

PROPERTY	UNITS
Density (Foam Core)	32 Kg/m³
Compressive Strength	>150 kPa @ 10%
Water Vapour Resistivity	>100 MNs/gm
Thermal Conductivity	0.022 W/mK
Service Temperature	-20°C - +100°C

Flat Roof

Xtratherm FR-ALU foil faced roof boards are suitable for use below single ply mechanically fixed roof membranes.

Note: FR-ALU is not suitable for applications with built-up bitumen based roofing or mastic asphalt systems.



Installation Guidelines

Flat Roof Insulation

Vapour Control Layer

The water vapour control layer should be laid with 150mm laps, which are turned up at any vertical upstand. When the insulation boards have been positioned the laps are turned over and sealed, prior to the roof finish being completed.

Laying - Metal/Timber Deck

Xtratherm FR-ALU foil faced boards should be laid over the vapour control layer in a break bonded pattern. The long edges of the boards should be laid at right angles to the corrugations and all board joints must be fully supported by the deck. The FR-ALU insulation boards are generally secured by approved mechanical fixings.

Laying - Concrete Deck

Xtratherm FR-ALU boards are laid over the vapour control layer in a break bonded pattern and secured with approved mechanical fixings, or secured under ballasted system. Care should be taken to ensure that the concrete deck is graded to the correct falls, is dry, clean and free from any projections or gaps.

Fixing

The specification for fixing of Xtratherm roof boards will vary with the location, roof height/width and topographical data, architectural specification should be consulted.

Generally with 1200 x 600 boards, a minimum of 4 fixings are adequate, located between 50mm and 150mm from all edges, additional fixings may be placed along the centre line. 11 fixings per 2.4 x 1.2m sheet is recommended. Counter sunk washers, 50mm in diameter should be used with each fixing. However, BS6399 Part 2 1995 should always be consulted. During the construction process, the construction should be protected from rain penetration during breaks in the process.

SPANNING

Xtratherm FR-ALU insulation boards laid over metal decks should be in accordance with BS 4841: Part 3

FR-ALU	TROUGH OPENING (mm)	
25		75
30	>75	100
35	>100	125
40	>125	150
45	>150	175
50	>175	200

TYPICAL 'U' VALUES

FR-ALU Over Concrete Deck	
FR-ALU (mm)	U-Value (W/m²K)
50	0.39
60	0.33
70	0.29
80	0.26
100	0.21
105	0.20
120	0.17

U-values given are indicative only, the effect of fixings has been assumed to have had no effect on the U-value, for comprehensive calculations on all deck types contact Xtratherm technical support.

TOLERANCE

DIMENSIONS	SIZE (mm)	TOLERANCE
Length	2400	+/- 5mm
Width	1200	+/- 3mm
Thickness	25,40,50	+/- 2 mm
	60,70,75,80-120	+/- 3 mm
Diagonals	Do not differ more than	0.3%

X022 Xtratherm®
ACHIEVING LOWER U-VALUES

Cavity Wall - Partial Fill

Robust tongued and grooved jointing

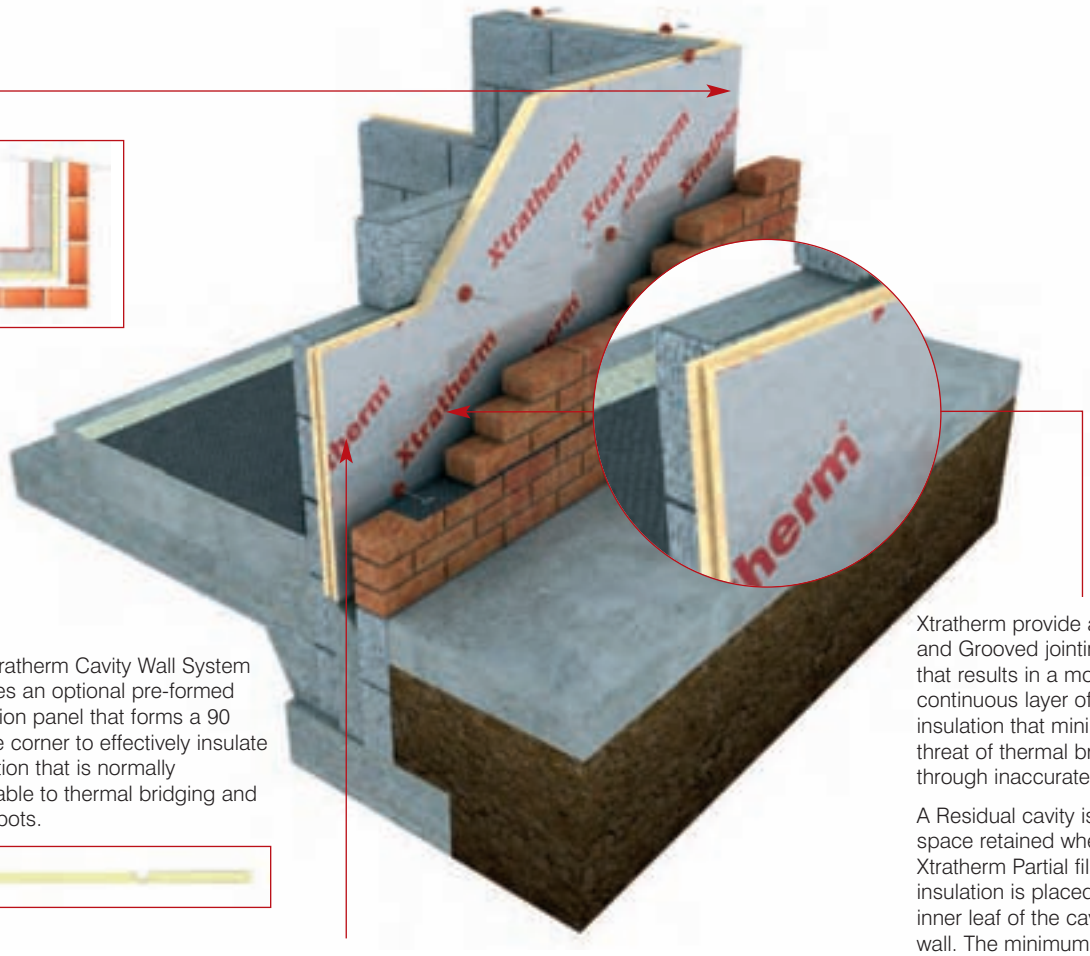
Clear cavity maintained

No exposure restrictions

Low emissivity foil facings

Extra thermal performance

The Xtratherm Cavity Wall System includes an optional pre-formed insulation panel that forms a 90 degree corner to effectively insulate a junction that is normally vulnerable to thermal bridging and cold spots.



The Low emissivity foil facing on Xtratherm boards improve the thermal performance of the wall.

The residual cavity is the most effective method of preventing rain penetrating a wall from the outside.

Xtratherm provide a Tongued and Grooved jointing system that results in a more robust, continuous layer of cavity wall insulation that minimises the threat of thermal bridging through inaccurate installation.

A Residual cavity is the air space retained when Xtratherm Partial fill Cavity Wall insulation is placed against the inner leaf of the cavity of a wall. The minimum residual cavity width allowed is 25mm in accordance with the XT/CW BBA certificate 07/4407 however 50mm may be required by the designer.

Specification Clause

The partial fill cavity wall insulation shall be Xtratherm Thin-R XT/CW(T&G) _ _ _ mm thick manufactured to EN ISO 9001:2000 by Xtratherm, comprising a CFC/HCFC free rigid Polyisocyanurate (PIR) core between low emissivity foil facings. The wall insulation shall be installed in accordance with instructions issued by Xtratherm.
Refer to NBS clause F30 151, F30 12

SHEET SIZE AND TOLERANCE

DIMENSIONS	SIZE (mm)
Length	1200
Width	450
Thickness	25 /30/35/40 (square edge)
	40/50/60/65/70/75/80/100 (T&G)

Thin-R XT/CW(T&G)

TYPICAL PHYSICAL CHARACTERISTICS

PROPERTY	UNITS
Density (Foam Core)	26-30 Kg/m³
Compressive Strength	>120 kPa
Water Vapour Resistivity	>100 MNs/gm
Thermal Conductivity	0.022 W/mK
Service Temperature	-20 to 100ºC
Surface Spread of Flame	Class 1

Improvements in U-values and accredited detailing can be achieved with and additional layer of and Xtratherm Thermal Liner. (See table for U-values)

Partial Fill Cavity Insulation

Xtratherm Thin-R XT/CW(T&G) is the best solution when designers/ regulations demand additional thermal insulation in external masonry walls. Xtratherm Thin-R boards achieve high standards of insulation whilst maintaining a residual cavity to prevent moisture penetration, without a substantial increase in the width of the cavity and of the overall wall thickness.

U-value calculations to BS EN ISO:6946

CAVITY WALL (XT/CW) - *Partial Fill*

U-values achieved using Xtratherm Thin-R XT/CW - Dot & Dab - 0.665 Cavity Resistance

BLOCK LAMBDA	XTRATHERM THICKNESS (mm)										
	30	35	40	45	50	55	60	65	70	80	100
0.11	0.31	0.29	0.27	0.26	0.24	0.23	0.22	0.21	0.20	0.18	0.16
0.14	0.32	0.30	0.28	0.26	0.25	0.24	0.22	0.21	0.20	0.19	0.16
0.19	0.34	0.31	0.29	0.27	0.26	0.24	0.23	0.22	0.21	0.19	0.16
0.25	0.35	0.32	0.30	0.28	0.27	0.25	0.24	0.22	0.21	0.19	0.17
0.34		0.33	0.31	0.29	0.27	0.26	0.24	0.23	0.22	0.20	0.17
0.51		0.34	0.32	0.30	0.28	0.26	0.25	0.23	0.22	0.20	0.17
1.15		0.35	0.33	0.31	0.29	0.27	0.25	0.24	0.23	0.21	0.17

Wall ties taken as S/S wire @ 3 ties/m² Wet Plaster Finish - increase insulation thickness by 5mm

XT/CW THICKNESS	BLOCK LAMBDA VALUE	U-VALUE	U-VALUE with additional 50mm XT/TL*
80mm	0.14	0.19	0.14
70mm	0.51	0.22	0.16
60mm	1.15	0.25	0.18

*Calculation includes 50mm residual cavity, with 3 S/S wall ties per m². *38mm PIR insulation on adhesive dabs. Accredited details should be followed to ensure calculated performance.*

Cavity Wall Installation Guidelines

Insert wall ties max 600mm cs one block course below DPC.

Secure cavity boards tight against inner leaf with retaining clip on approved wall ties.

Maintain a 50mm residual cavity to suit all exposure zones.

Ensure a minimum 25mm residual cavity is maintained. This may have to be increased to suit conditions. (e.g. NHBC)

Place wall ties at max 900x450 centres each board secured with a minimum of 3 wall ties.

Ensure block joints are fully bonded with unbroken mortar.

Fix wall ties 225mm vertically and 150mm horizontally from face of unbonded jambs.

Ensure wall ties (Cavity) are kept clean of mortar and are sloped towards outer leaf.

A cavity board should be used to keep cavity clean.

Xtratherm corner boards and preformed reveal panels may be fitted to provide robust detailing.

Xtratherm Hyclips can be used to secure boards tightly against inner leaf at sills and wall plate etc. where wall ties are inappropriate.

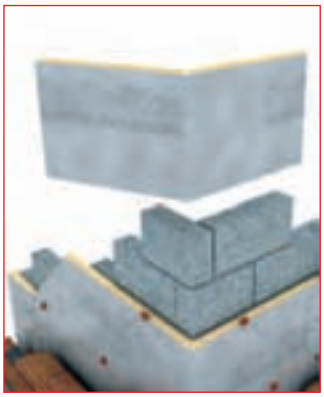
Resistance 'R' Values

The resistance value of any thickness of Xtratherm PIR can be ascertained by simply dividing the thickness of the material (in metres) by it's agrèment declared lambda value 0.022 W/mk. *eg 50mm = 0.050/0.022 = R2.27*

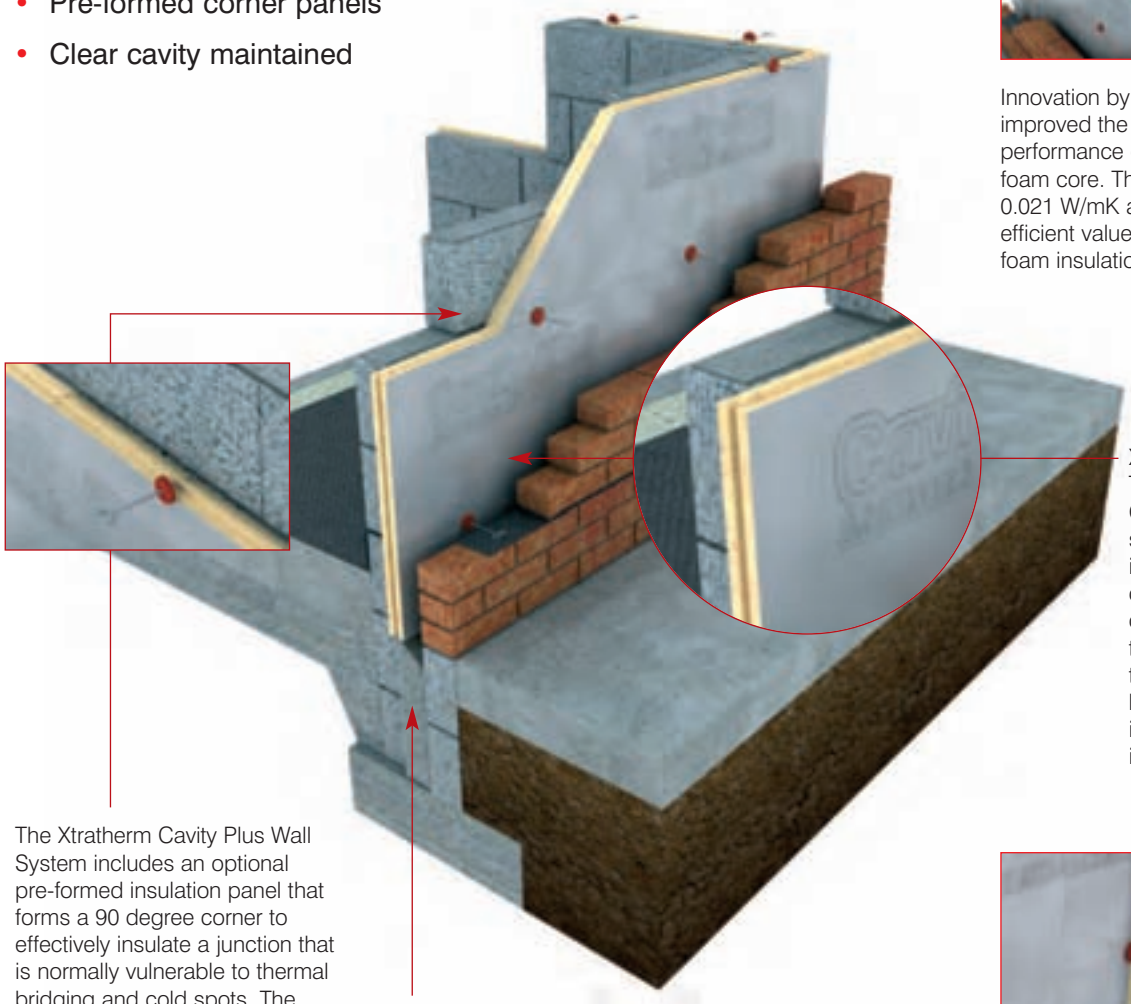
X021 Xtratherm
ACHIEVING LOWER U-VALUES

Cavity-Plus Wall

- Low emissivity foil with a cavity resistance value of 0.665
- Outstanding thermal performance
- Robust tongue & groove jointing
- Pre-formed corner panels
- Clear cavity maintained



Innovation by Xtratherm have improved the insulation performance of the Cavity Plus foam core. The Lambda value of 0.021 W/mK achieves the most efficient value available for rigid foam insulation.

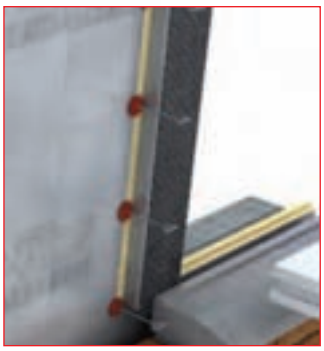


Xtratherm provide a Tongued and Grooved jointing system that results in a more robust, continuous layer of cavity wall insulation that minimises the threat of thermal bridging through inaccurate installation.

The Xtratherm Cavity Plus Wall System includes an optional pre-formed insulation panel that forms a 90 degree corner to effectively insulate a junction that is normally vulnerable to thermal bridging and cold spots. The robust detailing provided by the Cavity Plus System surpasses the standards asked for in Accredited Details.

Xtratherm Cavity Plus Wall insulation is placed in the cavity of a wall. The minimum residual cavity width allowed is 25mm in accordance with the XT/CW BBA certificate 07/4407.

The Low emissivity foil facing on Xtratherm boards improve the thermal resistance of the residual cavity to a certified value of 0.665.



Xtratherm Reveal boards are pre-cut to tightly fit around reveals at window and door openings, allowing ties to be positioned 150mm in from the edge of the reveal and at every block joint providing a superior accredited detail.

Specification Clause

The partial fill cavity wall insulation shall be Xtratherm Thin-R XT/CWP _ _ _ mm thick, with a lambda value of 0.021 W/mK manufactured to EN ISO 9001:2000 by Xtratherm, comprising a CFC/HCFC free rigid Polyisocyanurate (PIR) core between low emissivity foil facings. The wall insulation shall be installed in accordance with instructions issued by Xtratherm.
Refer to NBS clause F30 155, F30 12

Thin-R XT/CWP(T&G)

Partial Fill Cavity Wall

Typical U-values XT/CWP

BLOCK LAMBDA	THICKNESS OF XT/CWP		
	50mm	70mm	100mm
0.14	0.24	0.20	0.15
0.51	0.27	0.21	0.16
1.15	0.28	0.22	0.17

Typical U-values XT/CWP
+ 50mm XT/TL Thermal Laminate

BLOCK LAMBDA	Thickness of XT/CWP with addition Thermal Liner XT/TL*		
	50mm	70mm	100mm
0.14	0.17	0.15	0.12
0.51	0.18	0.16	0.13
1.15	0.19	0.16	0.13

*Calculation includes min 25mm residual cavity, with 2.5 S/S wall ties per m². *38mm PIR insulation on adhesive dabs. The additional internal lining will improve resultant thermal bridging Ψ values. Accredited details should be followed to ensure expected performance.*

SHEET SIZE AND TOLERANCE

DIMENSIONS	SIZE (mm)
Length	1200
Width	450
Thickness	50/60/70/80/100(T&G)

**Other sizes are available subject to quantity and lead time*

Partial Fill Cavity Insulation

Xtratherm Thin-R/CWP(T&G) is the best solution when designers/ regulations demand higher U-value performance in external masonry walls. Xtratherm Thin-R Cavity Plus boards achieve these higher standards whilst maintaining a residual cavity - the most effective protection against the ever more prevalent wind driven rain. The outstanding performance of Xtratherm Cavity Plus allows these goals to be achieved without a substantial increase in the overall wall thickness.

Cavity Wall Installation Guidelines

Insert wall ties max 600mm cs one block course below DPC.

Secure cavity boards tight against inner leaf with retaining clip on approved wall ties.

Ensure a minimum 25mm residual cavity is maintained. This may have to be increased to suit conditions. (e.g. NHBC)

Place wall ties at max 900x450 centres each board secured with a minimum of 3 wall ties.

Ensure block joints are fully bonded with unbroken mortar.

Fix wall ties 225mm vertically and 150mm horizontally from face of unbonded jambs.

Ensure wall ties (Cavity) are kept clean of mortar and are sloped towards outer leaf.

A cavity board should be used to keep cavity clean.

Xtratherm corner boards and preformed reveal panels may be fitted to provide improved accredited detailing.

Xtratherm Hyclips can be used to secure boards tightly against inner leaf at sills and wall plate etc. where wall ties are inappropriate.

TYPICAL PHYSICAL CHARACTERISTICS

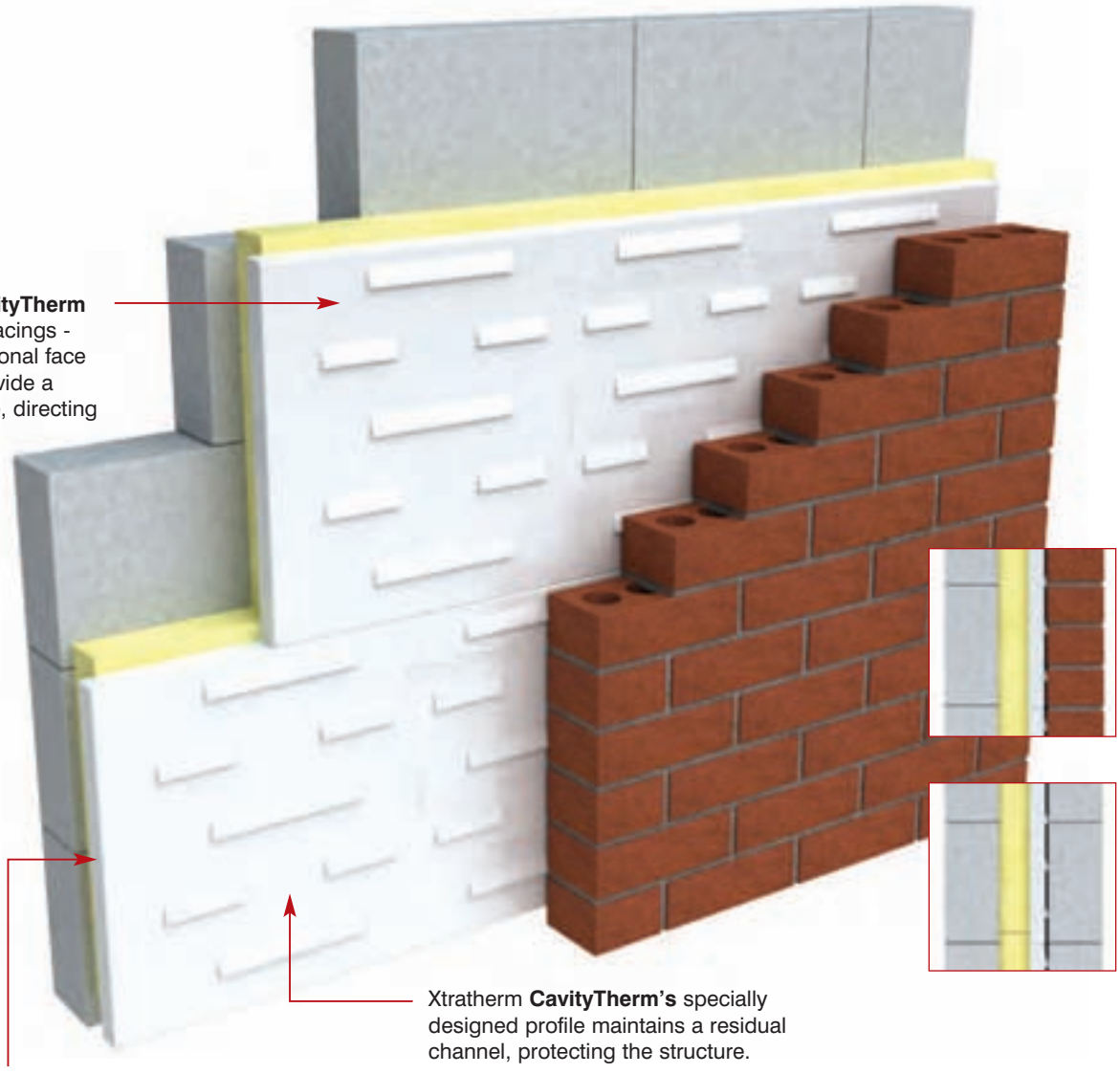
PROPERTY	UNITS
Density (Foam Core)	28-32 Kg/m³
Compressive Strength	>120 kPa
Water Vapour Resistivity	>100 MNs/gm
Thermal Conductivity	0.021 W/mK
Service Temperature	-20 to 100°C
Surface Spread of Flame	Class 1

X021 Xtratherm
ACHIEVING LOWER U-VALUES

Cavity**Therm** CT/PIR

BUILT-IN CAVITY FILL INSULATION

Xtratherm **CavityTherm full fill built-in** wall insulation board is a high performance composite board of PIR core with a **lambda value of 0.021W/mK**. The boards have gas tight facings with one face bonded to a profiled HIPS skin during manufacture to provide a drainage plane. **CavityTherm'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.



Xtratherm **CavityTherm** has gas tight facings - with one additional face bonded to provide a drainage plane, directing moisture onto the outer leaf.

Xtratherm **CavityTherm's** specially designed profile maintains a residual channel, protecting the structure.

Installing Xtratherm **CavityTherm** gives U-values that are indicative of targets set to achieve the higher levels of the Code for Sustainable Homes - but within traditional construction allowing the architect to design low carbon homes and maintain an overall cavity width of 100mm.

CavityTherm Sizes

Dimensions	Size (mm)
Length	1200
Width	450
Thickness*	75, 90, 100, 125, 150

**Nominal width includes 5mm profiled facing - Other sizes may be available subject to quantity and lead time.*

RESISTANCE VALUES

CavityTherm Thickness (mm)	Resistance (R)
150	6.90
125	5.71
100	4.52
90	4.05
75	3.33

0.021 W/m²K

Xtratherm®

Xtratherm CT/PIR

- The new **CavityTherm** wall insulation system works within a traditional 100mm cavity using traditional foundations, building skills and materials to achieve U-values as low as 0.16W/m²K. Maintaining the standard overall wall width means no loss of living space internally nor an enlarged building footprint.
- The new **CavityTherm** insulation system is suitable for all housing types in mixed developments up to 12m in height and allows for most external wall finishes to satisfy planning requirements.
- **CavityTherm** is available nationwide on short lead times through the traditional supply chain.

Typical U-values

CavityTherm U-values			
Inner Leaf	**Outer Leaf**	**75mm** CavityTherm (W/m²K)**	**100mm** CavityTherm (W/m²K)**
Aerated block*	Brick	0.20	0.16
Aerated block	Brick	0.21	0.17

*Dot & Dab with lightweight plaster coat. *Thin joint. **Nominal 70mm & 95mm PIR*

*Building regulations are committed to delivering Zero Carbon Homes by 2016 and the Government has announced that the fabric standards required to achieve this goal will be based on the revisions outlined in the Code for Sustainable Homes 2010 where the Zero Carbon Hub set benchmarks for fabric performance. Their document defining a **Fabric Energy Efficiency Standard (FEES)** for Zero Carbon Homes, gives the maximum energy demand for space heating and cooling in two levels only, and gives indicative U-values for walls, floors and roofs to achieve the goal.
The defining of indicative U-values (along with air permeability and thermal bridging targets) for the first time, gives designers and builders a target to achieve Zero Carbon. CavityTherm will achieve the target wall U-value within the traditional 100mm cavity.

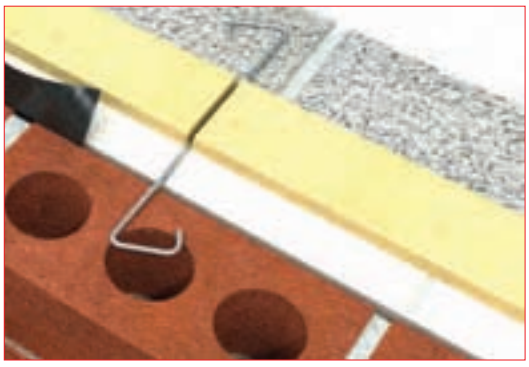
TYPICAL PHYSICAL CHARACTERISTICS

PROPERTY	UNITS
Density Typical (Foam Core)	30 Kg/m3
Compressive Strength	>100 kPa @ 10%
Thermal Conductivity	0.021 W/mK
Service Temperature	-20°C - +100°C

DESIGN

The Xtratherm CavityTherm System can be installed by competent, traditional brick/block layers. The engineered jointing of the components makes installation easier and ensures the continuity of the insulation layer.

The board includes specifically designed rebated edge detailing on all four edges to allow the system to tightly interlock when installed.



Wall tie sloping outward
Sloping wall tie in pre-formed slot

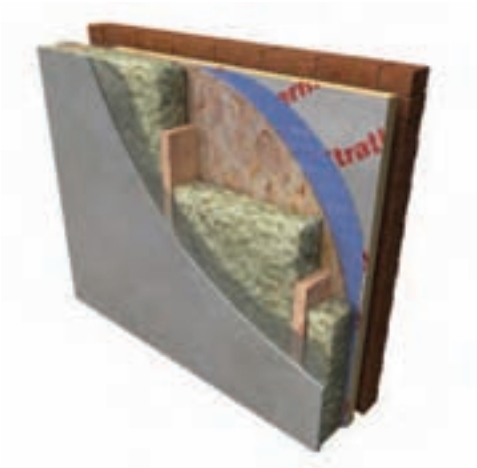
Results in Eco-friendly, genuinely desirable dwellings that people will choose to live in.

Timber Frame Insulation Systems

Xtratherm's Timber Frame Insulation Systems, brings Timber Framed wall insulation performance to new levels, surpassing regulation default values of 2006 and aiming for those standards indicated for 2016 when Zero Carbon or passive homes will be required under the Building Regulations.

System 1

XT Sheathing with full fill fibre between studs (0.044)



Using a fibrous glass or stonewool type of material between studs is the most common method of insulating Timber Framed constructions. Although not as efficient in insulation values, the flexibility of the materials allows the insulation to be squeezed between studs with irregular spacings. Placing a lining of Xtratherm XT/SB Sheathing Boards into the traditional cavity of the construction, and effectively insulating the thermal bridging caused by the timber studding drastically improves the insulation value of the walls.

Typical U-values XT/SB

XT/SB Thickness	U - VALUE	
	89mm Stud	140mm Stud
30mm	0.24	0.19
40mm	0.22	0.18
50mm	0.20	0.17

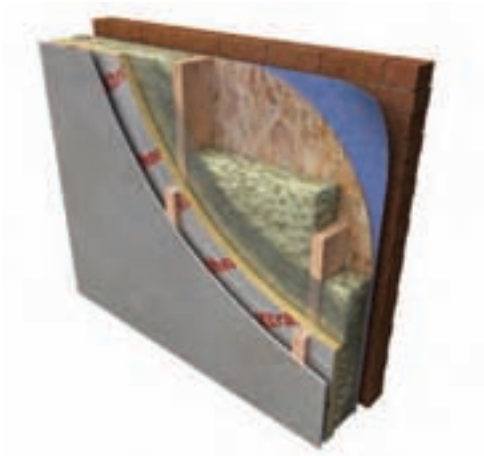
XTRATHERM XT/SB SHEET SIZE

DIMENSIONS	XTRATHERM XT/SB
Length (mm)	1200
Width (mm)	600
Thickness (mm)	30, 40, 50

Other sizes and thicknesses available depending on quantity and lead time.

System 2

XT Lining with Service Void, full fill fibre between studs (0.044)



As with system 1, using a fibrous glass or stonewool type of material between studs allows the insulation to be squeezed between studs with irregular spacings. An alternative to applying a Sheathing Insulation into the cavity to improve the thermal bridging factor of the timber, is to place a lining of Xtratherm XT/TF over the studding to the inside face of the construction, thus improving the insulation value of the wall. An insulated service duct can be created by placing counterbattens between the Xtratherm and plasterboard finish allowing services to be placed without compromising the integrity of the vapour control layer and enhancing the air tightness.

Typical U-values XT/TF

XT/TF Thickness	U - VALUE	
	89mm Stud	140mm Stud
25mm	0.25	0.20
30mm	0.24	0.19
40mm	0.21	0.18
50mm	0.19	0.16

XTRATHERM XT/TF SHEET SIZE

DIMENSIONS	XTRATHERM XT/TF
Length (mm)	2400
Width (mm)	1200
Thickness (mm)	30, 40, 50, 80, 90, 100, 125

Other sizes and thicknesses available depending on quantity and lead time.

Building Timber Frame construction is a fast, systematic method that can results in buildings that perform well in Environmental terms and provide excellent Energy Performance ratings, if insulated to the highest standards.

Placing insulation between the timber framing studding has proven effective until recent changes to building regulations have asked for U-values better than 0.27 W/m²K. Improving the wall performance past this figure has proven difficult because of the amount of timber that bridges the insulation. The timber studs, wall and foot plates, and noggins that cut through the insulation when it is placed between the studs must be taken at a default of 15% of the total wall area, but can be higher in certain circumstances.

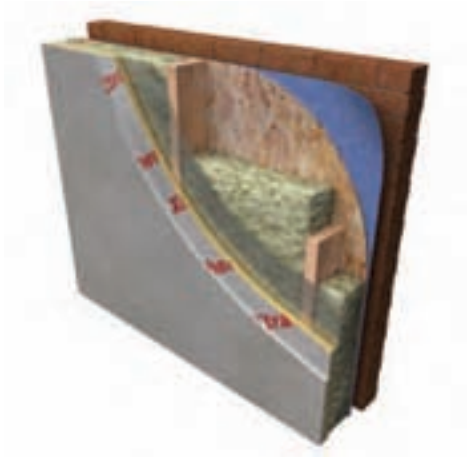
Because of the restriction that stud depth presents, the only pragmatic solution to pushing timber frame wall performance toward 0.20 W/m²K is to actually insulate the thermal bridges (Timber studs) with either internal insulated lining or externally with an insulated sheathing board in the traditional cavity.

TYPICAL PHYSICAL CHARACTERISTICS

PROPERTY	UNIT
Density (Foam Core)	32 (Kg/m³)
Compressive Strength	>140 (kPa)
Water Vapour resistivity	>100 (MNs/gm)
Thermal Conductivity	0.022 (W/mK)
Service Temperature	-20 to +100 (°C)
Surface Spread of flame	Class 1

System 3

XT Lining with full fill fibre between studs (0.044)



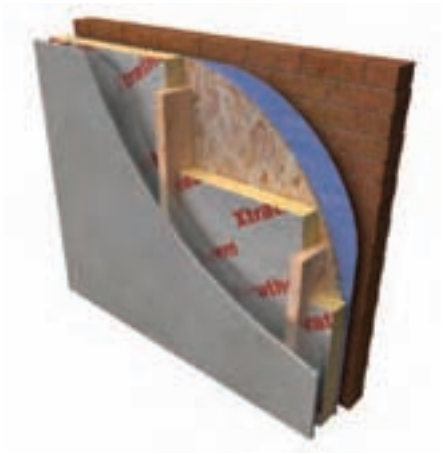
As with systems 1 & 2, using a fibrous glass or stonewool type of material between studs allows the insulation to be squeezed between studs with irregular spacings. An alternative insulation lining system to improve the thermal bridging factor of the timber, is to place a lining of Xtratherm over the studding to the inside face of the construction.

Typical U-values XT/TF

XT/TF Thickness	U - VALUE	
	89mm Stud	140mm Stud
25mm	0.29	0.23
30mm	0.27	0.22
40mm	0.24	0.20
50mm	0.22	0.18

System 4

XT only between studs



The traditional method of insulating Timber Framed walls is to provide insulation between the studs only. Typically 80mm of Xtratherm XT/TF will achieve a U-value of 0.27W/m²K.

Typical U-values XT/TF

XT/TF Thickness	U - VALUE	
	89mm Stud	140mm Stud
80mm	0.30	0.27
90mm	-	0.25
100mm	-	0.23
125mm	-	0.21

U-value Performance

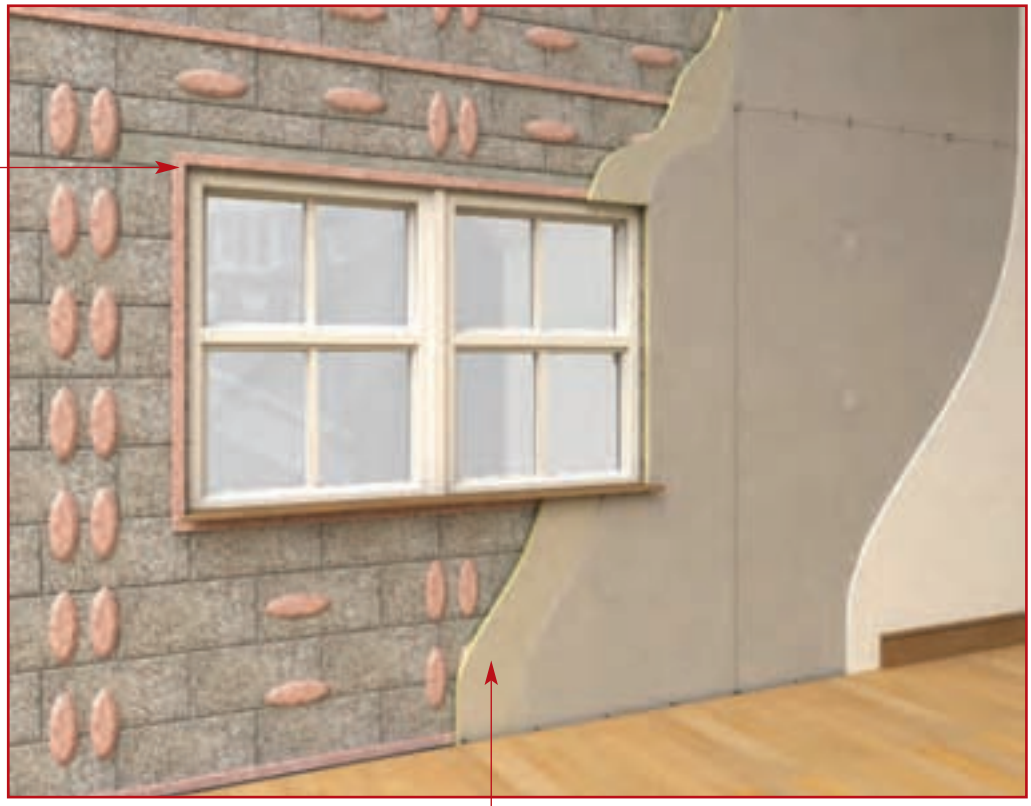
The tables shown give indicative U-value performance using Xtratherm Systems in timber framed constructions. Values have been calculated on the depth of studding being 89mm and 140mm and the thermal bridging fraction taken at 15%.

X022 Xtratherm®
ACHIEVING LOWER U-VALUES

Thermal Lining XT/TL

High Thermal Performance
Drylining & Insulation in one fix
Shorter drying time
Responsive insulation system

FIRE STOPS
An important factor when dry lining a wall is to provide fire stops along the top and bottom of each sheet and around all openings (Doors & Windows etc.) These are provided by continuous plaster ribbons and prevent fire, penetrating behind the insulation layer, it also prevents Thermal Looping.



THERMAL LINER - DOT & DAB - Typical installation

The facing on Xtratherm boards provide a gas and vapour tight barrier, taping and filling the joints on plasterboard finishes in accordance with drylining good practice, will result in a vapour control layer being created.

Specification Clause

The insulated dry lining wall insulation shall be Xtratherm Thin-R XT/TL, _ _ _mm plasterboard bonded to _ _ _mm CFC/HCFC free rigid Polyisocyanurate (PIR) manufactured to EN ISO 9001:2000 by Xtratherm. The insulated dry lining plasterboard XT/TL shall be installed in accordance with instructions issued by Xtratherm.
Refer to NBS clause K10 205

THIN-R SHEET SIZE

DIMENSIONS	SIZE (mm)
Length	2400
Width	1200
Thickness* Plasterboard 12.5mm +	25/38/50/60

**Other sizes available subject to quantity and lead time.*
Note: Standard product supplied UK - tapered edge - 12.5mm only.

Thin-R XT/TL

Thermal Lining Insulation

TYPICAL PHYSICAL CHARACTERISTICS

PROPERTY	UNITS
Density (Foam Core)	32 Kg/m³
Compressive Strength	>140 kPa
Water Vapour Resistivity	>100 MNs/gm
Thermal Conductivity	0.022 W/mK
Surface Spread of Flame	Class 1*

**When laminated to plasterboard Thin-R XT/TL is deemed to be class 0 in accordance with the building regulations.*

Xtratherm Thin-R Thermal Liner XT/TL is a composite insulated panel of Xtratherm Polyiso (PIR) core with a composite kraft paper facing bonded to plasterboard for internal applications, fixed with propriety adhesive bonding. XT/TL is designed to provide high levels of thermal insulation and dry lining in one operation for masonry walls.

U-value calculations to BS EN ISO:6946

WALLS (XT/TL) - *Dry Lined*

	XTRATHERM THICKNESS (mm)						
WALL TYPE	**25**	**40**	**50**	**55**	**60**	**65**	**70**
300mm Cavity Wall Brick/Block	0.53	0.39	0.33	0.31	0.29	0.27	0.25
215mm Solid Brickwork	0.56	0.41	0.34	0.32	0.30	0.28	0.26

Contact Xtratherm Technical Support for specific U-value calculations.

Resistance 'R' Values

The resistance value of any thickness of Xtratherm PIR can be ascertained by simply dividing the thickness of the material (in metres) by it's agrèment declared lambda value 0.022 W/mk. *eg 50mm = 0.050/0.022 = R2.27*

Installation Guidelines

Plaster-dab Bonding XT/TL

Align the XT/TL Thermal Liner squarely on wall. Allow a 15mm expansion joint at the top and bottom of the panel, and fill with foam filler.

Mark the position of the panel on the wall.

Apply adhesive dabs to the wall in accordance with BS8212:1995 & BS 8000: Part 8: 1994. Vertical dabs @ 300mm cs 25mm in from edge. Dabs 50-75mm wide approx 25mm deep to allow for tamping. Total contact with boards area should be 20%.

Max installation height for this system is 3m.

Ensure a 50mm continuous ribbon top and bottom and around any openings to provide firestops, and to achieve predicted U-value and airtightness performance.
(See accredited details)

Lift the XT/TL Thermal Liner into position using wedges on the floor. Apply pressure to the board to level & embed in the adhesive.

Insulation should be cut back to accommodate an adjoining panel at external corners.

When the adhesive has dried, 3 mechanical fixings (fireproof) should be fixed through the centre of the board. Setting out and planning is essential.

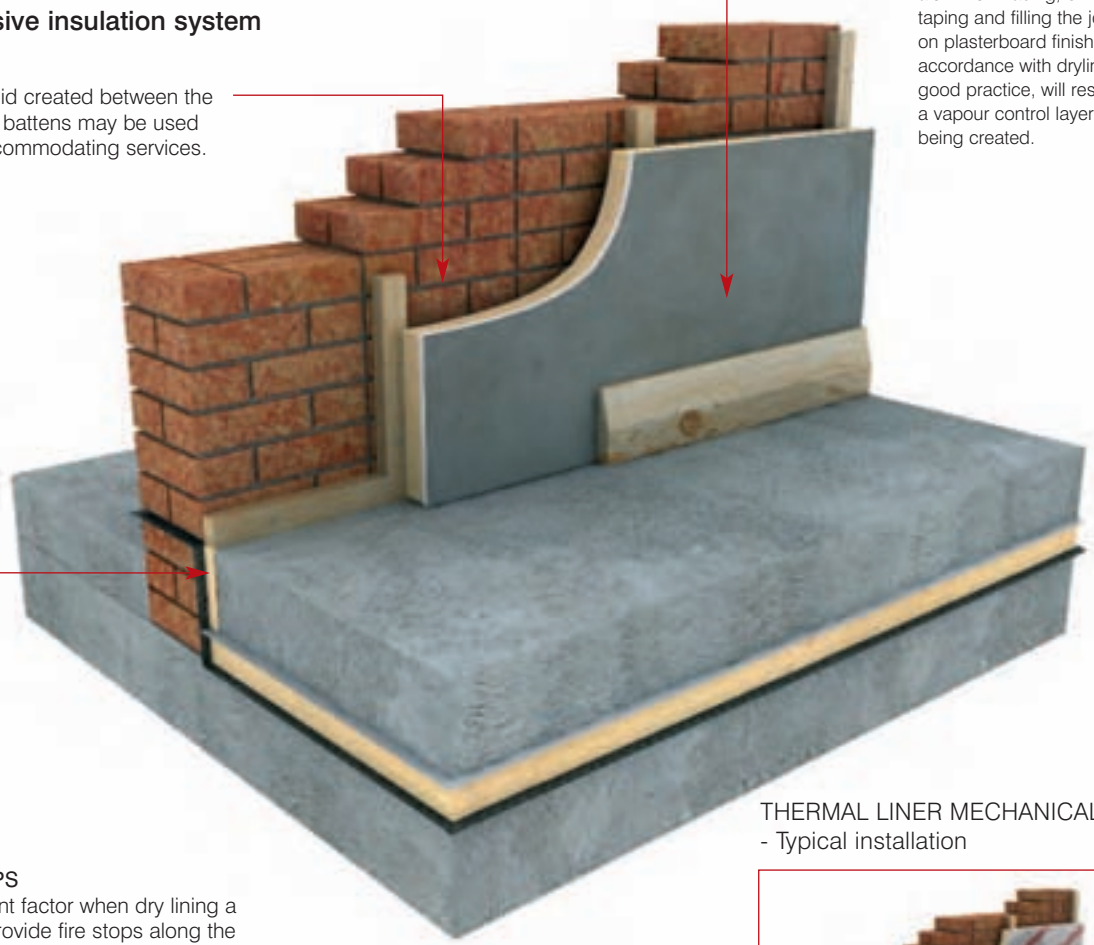
X022 Xtratherm®
ACHIEVING LOWER U-VALUES

Thermal Lining XT/TL-MF

High Thermal Performance
Drylining & Insulation in one fix
Shorter drying time
Responsive insulation system

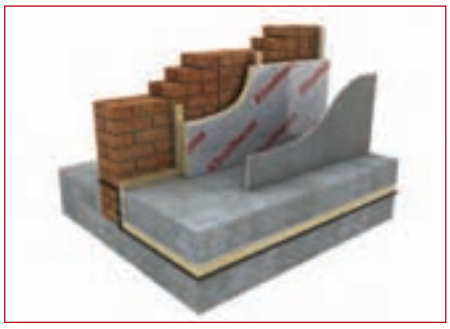
The void created between the timber battens may be used for accommodating services.

The facing on Xtratherm boards provide a gas and vapour tight barrier, taping the joints between the aluminium facing, or taping and filling the joints on plasterboard finishes in accordance with drylining good practice, will result in a vapour control layer being created.



FIRE STOPS
An important factor when dry lining a wall is to provide fire stops along the top and bottom of each sheet and around all openings (Doors & Windows etc). These are provided by the timber battens and prevent fire, penetrating behind the insulation layer, it also helps to prevent thermal looping.

THERMAL LINER MECHANICALLY FIXED
- Typical installation



Specification Clause
The insulated dry lining wall insulation shall be Xtratherm Thin-R XT/TL-MF, 12.5mm plasterboard bonded to _ _ _mm CFC/HCFC free rigid Polyisocyanurate core between low emissivity foil faces manufactured to EN ISO 9001:2000 by Xtratherm. The insulated dry lining plasterboard XT/TL-MF shall be mechanically fixed to battens, or proprietary sytem in accordance with instructions issued by Xtratherm.
Refer to NBS clause K10 205.

THIN-R SHEET SIZE

DIMENSIONS	SIZE (mm)
Length	2400
Width	1200
Thickness* Plasterboard 12.5mm +	25/40/50/70

**Other sizes available subject to quantity and lead time.*
Note: Standard product supplied UK - tapered edge - 12.5mm only.

Thin-R XT/TL-MF

Thermal Lining Insulation

TYPICAL PHYSICAL CHARACTERISTICS

PROPERTY	UNITS
Density (Foam Core)	32 Kg/m³
Compressive Strength	>140 kPa
Water Vapour Resistivity	>100 MNs/gm
Thermal Conductivity	0.022 W/mK
Surface Spread of Flame	Class 1*

**When laminated to plasterboard Thin-R XT/TL(MF) is deemed to be class 0 in accordance with the building regulations.*

Xtratherm Thin-R Thermal Liner is a composite insulated panel of Xtratherm Polyiso (PIR) core with a foil face one side bonded to plasterboard for mechanicaly fixing to internal walls. XT/TL-MF is designed to provide high levels of thermal insulation and dry lining in one operation for suitable masonry walls, sloped rafters and ceilings in new build and refurbishment situations.

U-value calculations to BS EN ISO:6946

WALLS (XT/TL-MF) - *Dry Lined*

	XTRATHERM THICKNESS (mm)				
WALL TYPE	**25**	**40**	**50**	**60**	**70**
300mm Cavity Wall Brick/Block	0.43	0.33	0.29	0.25	0.23
215mm Solid Brickwork	0.45	0.35	0.30	0.26	0.23

Contact Xtratherm Technical Support for specific U-value calculations.

Resistance 'R' Values

The resistance value of any thickness of Xtratherm PIR can be ascertained by simply dividing the thickness of the material (in metres) by it's agrèment declared lambda value 0.022 W/mk.
eg 50mm = 0.050/0.022 = R2.27

Installation Guidelines

Mechanical Fixing XT/TL-MF

Fix a pre-treated timber batten horizontally at ceiling level and another 20mm above the finished floor level.

Fix vertical battens at max 600mm centres.

Ensure battens are wide enough to offer 20mm support to all four edges of the plasterboard.

Pack battens if necessary to level the wall.

Trim all openings and service penetrations with timber battens.

Insulation should be cut back to accommodate an adjoining panel at external corners.

Lift the XT/TL-MF Thermal Liner into position using wedges on the floor.

Screws should be fixed to the timber batten at 150mm centres, at least 12mm in from the board edge. The fixings should penetrate at least 25mm into the batten.

Installation must be in accordance with good dry lining practice. BS 8212:1995 should be considered, careful setting out and planning is essential, fill any gaps with foam filler.

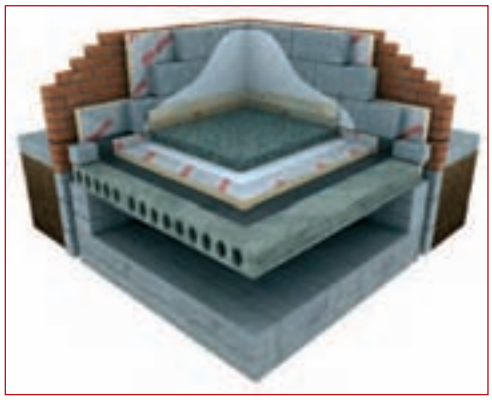
Accredited details should be followed to ensure that calculated performance is achieved.

X022 Xtratherm®
ACHIEVING LOWER U-VALUES

Under Floor

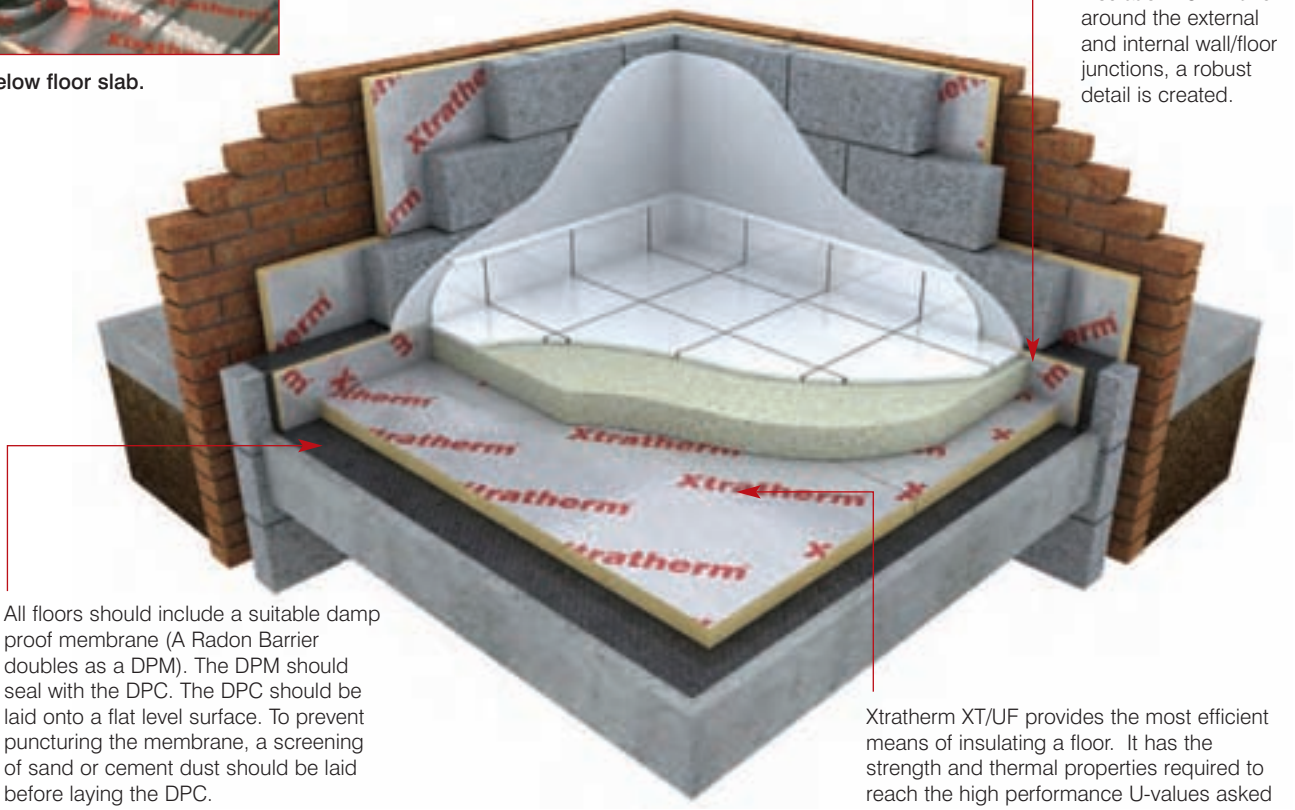
Extra thermal performance
Suitable for under floor heating
Reduced insulation thickness
High compressive strength

Below floor slab.



All suspended floors must be ventilated from the underside. Ventilation should not be restricted by any supporting or sleeper wall used to support the floor system.

Detailing at wall/floor junctions is essential to reduce thermal bridging. By placing an upstand of Xtratherm Perimeter insulation 25mm thick around the external and internal wall/floor junctions, a robust detail is created.



All floors should include a suitable damp proof membrane (A Radon Barrier doubles as a DPM). The DPM should seal with the DPC. The DPC should be laid onto a flat level surface. To prevent puncturing the membrane, a screening of sand or cement dust should be laid before laying the DPC.

It is good practice to place a layer of polythene over any under floor insulation to act as a separating layer in accordance with the Good Building Guide GBG 45 'Insulating Ground Floors'

UNDER FLOOR SLAB - Typical installation

Xtratherm XT/UF provides the most efficient means of insulating a floor. It has the strength and thermal properties required to reach the high performance U-values asked for in the Building Regulations. Xtratherm Thin-R should be laid with closely butted joints, laid staggered with a break bonded pattern and fitted tightly at edges and around any service penetrations.

Specification Clause

The floor insulation shall be Xtratherm Thin-R XT/UF _ _ _ mm thick manufactured to EN ISO 9001:2000 by Xtratherm, comprising a CFC/HCFC free rigid Polyisocyanurate (PIR) core between low emissivity foil facings. The floor insulation shall be installed in accordance with instructions issued by Xtratherm. *Refer to NBS clause E20 200, E20 30.*

THIN-R SHEET SIZE

DIMENSIONS	SIZE (mm)
Length	2400
Width	1200
Thickness	25/30/35/40/50/60/65/70/75/90/100/ 110/125/150

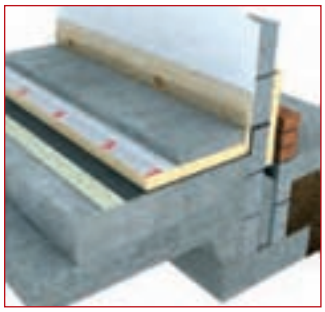
Thin-R XT/UF

Under Floor Insulation

TYPICAL PHYSICAL CHARACTERISTICS

PROPERTY	UNITS
Density (Foam Core)	30 Kg/m³
Compressive Strength	>140 kPa
Water Vapour Resistivity	>100 MNs/gm
Thermal Conductivity	0.022 W/mK
Service Temperature	-20 to 100°C
Surface Spread of Flame	Class 1

The floor in any building is an area of considerable heat loss if it is not properly insulated. Xtratherm Thin-R when installed within a floor structure, will significantly improve the U-value (Thermal Transmittance) of new or existing floors.



Installation Guidelines

Solid Under Floor

Lay the hardcore in layers 150mm min/ 250mm max and compact well.

Blind surface with quarry dust/sand to provide level surface.

Place DPM eg. 1200g polythene or Radon Barrier over blinding, tape joints to prevent passage of ground moisture.

Carry DPM up wall to meet and seal with DPC.

Lay the Xtratherm XT/UF boards in staggered jointed pattern.

Closely butt all edges.

Place Xtratherm floor upstand around floor perimeter to provide Robust detail.

Seal around any service penetrations.

Layer a polythene vapour control layer min 0.125mm thick over the insulation with 150mm lap joints.

Lay concrete slab to the correct thickness.

Below floor screed

Follow the same procedure as above.

Leave the concrete subfloor, (over which the insulation is to be laid), as long as possible to dry out. Ref: BS 8203:2009

Lay screed to specification over concrete slab.

SOLID FLOOR - Typical U-values XT/UF

PERIMETER/AREA RATIO (PA)

	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	50	55	55	60	65	65	65	0.25
U-Value	0.24	0.24	0.24	0.24	0.25	0.25	0.24	0.25	0.25	
Thickness (mm)	30	50	60	65	70	70	75	75	80	0.22
U-Value	0.22	0.22	0.22	0.22	0.22	0.22	0.22	0.22	0.21	
Thickness (mm)	40	60	65	75	80	80	90	90	90	0.20
U-Value	0.20	0.20	0.20	0.20	0.20	0.20	0.19	0.19	0.20	
Thickness (mm)	75	90	100	110	115	115	120	120	120	0.15
U-Value	0.15	0.15	0.15	0.15	0.15	0.15	0.15	0.15	0.15	

Resistance 'R' Values

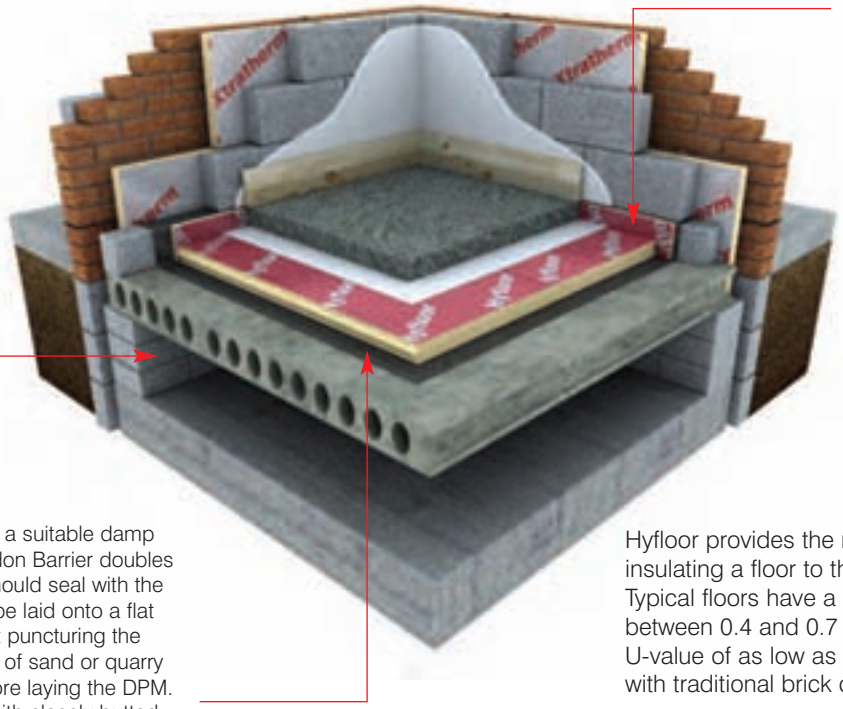
The resistance value of any thickness of Xtratherm PIR can be ascertained by simply dividing the thickness of the material (in metres) by it's agrèment declared lambda value 0.022 W/mk.
eg 50mm = 0.050/0.022 = R2.27

X022 Xtratherm®
ACHIEVING LOWER U-VALUES

Hyfloor Under Floor Insulation

Hyfloor Under Floor Insulation has superior thickness to performance ratio allowing the lower targets required under the new Building Regulations to be achieved with minimum thicknesses.

- **High Compressive Strength.**
- **Achieves Zero Carbon Standards**
- **Thicknesses to tie in with brick coursing.**
- **T&G jointing on all four edges.**
- **Extra thermal performance.**
- **Branded Boards.**



Suspended floors must be ventilated from the underside. Ventilation should not be restricted by any supporting or sleeper walls used to support the floor system.

Detailing at wall/floor junctions is essential to reduce thermal bridging. By placing an upstand of Xtratherm Perimeter insulation 25mm thick around the external and internal wall/floor junctions, a robust detail is created.

All floors should include a suitable damp proof membrane (A Radon Barrier doubles as a DPM). The DPM should seal with the DPC. The DPM should be laid onto a flat level surface. To prevent puncturing the membrane, a screening of sand or quarry dust should be laid before laying the DPM. Hyfloor should be laid with closely butted T&G joints, laid staggered with a break bonded pattern and fitted tightly at edges and around any service penetrations.

It is good practice to place a layer of polythene over any under floor insulation to act as a separating layer in accordance with the Good Building Guide GBG 45 'Insulating Ground Floors'

Hyfloor provides the most efficient means of insulating a floor to the highest standards. Typical floors have a Perimeter/Area ratio of between 0.4 and 0.7 - Hyfloor will achieve a U-value of as low as 0.12 W/m²K, AND tie in with traditional brick coursing.

U-values achieved using Hyfloor (W/m²K)				
P/A	0.40	0.50	0.60	0.70
Thickness				
75	0.19	0.20	0.21	0.21
100	0.15	0.16	0.17	0.17
125	0.13	0.14	0.14	0.14
140	0.12	0.13	0.13	0.13

The above calculations are indicative only, for specific calculations contact technical support.

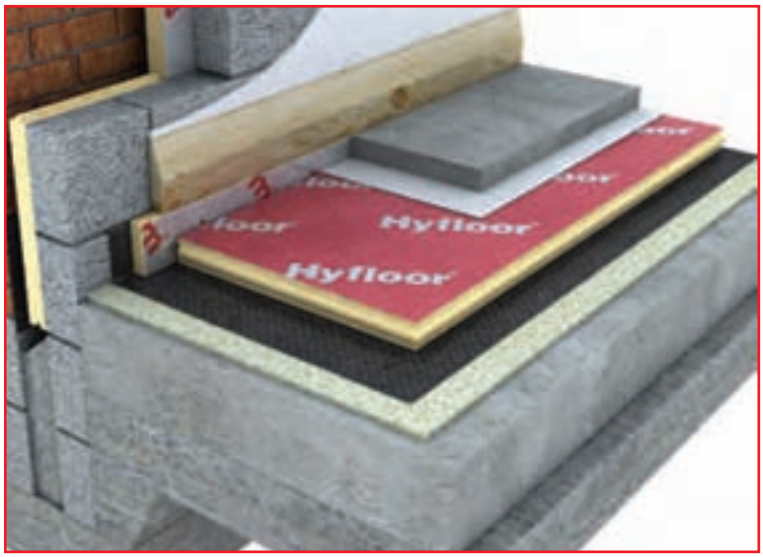
The (l) lambda values and (R) resistance values stated are in accordance with the 90/90 principles as stated in the harmonised European Standard EN 13165: 2008. U-values are calculated in compliance with BS EN ISO 6946 (Combined method).

Specification Clause

The floor insulation shall be Xtratherm Hyfloor T&G Floor Insulation _ _ _ mm thick manufactured to EN ISO 9001:2000 by Xtratherm, comprising a CFC/HCFC free rigid T&G Polyisocyanurate (PIR) core between gas tight facings. The floor insulation shall be installed in accordance with instructions issued by Xtratherm.

Hyfloor XT/HYF

Hyfloor is an engineered jointed, T&G all four edges high performance Under Floor Insulation consisting of a high performance rigid Polyisocyanurate (PIR) core with branded gas tight facings both sides, it has a thermal conductivity of 0.022W/mK.



Hyfloor Tongued & Groove Jointing

Installation Guidelines

Below Floor Slab

Where Hyfloor Insulation is used below the floor slab, lay the hardcore in layers; min 150mm - max 225mm; each layer should be well compacted, with the surface blinded with quarry dust or sand to provide suitable surface for laying DPM.

A damp proof membrane e.g. 1200 gauge polythene or radon barrier should be laid over blinding with joints taped to prevent passage of ground moisture, it should be carried up the wall until it meets and seals with the DPC.

Below Floor Screed (Solid or Suspended)

Hylfoor Insulation can be used below the floor screed. The same procedure should be followed ensuring that the floor slab or beams onto which the insulation is being laid is level, a blinding of sand may be required.

The concrete floor over which the insulation is to be laid should be left as long as possible to maximise drying out, in accordance with BS8203: 2009 Section 3.1.2.

The minimum thickness of sand and cement
screed is 65mm for domestic construction and 75mm for most other buildings. However, architectural specifications should be consulted.

TYPICAL PHYSICAL CHARACTERISTICS

PROPERTY	UNITS
Density (Foam Core)	30 Kg/m³
Compressive Strength	>140 kPa
Water Vapour Resistivity	>100 MNs/gm
Thermal Conductivity	0.022 W/mK
Service Temperature	-20 to 100ºC
Surface Spread of Flame	Class 1

Pack Sizes

Length (m)	Width (m)	Thickness (mm)	Sheets per pack	M² per pack
2.400	1.200	75	4	11.52
2.400	1.200	100	4	11.52
2.400	1.200	125	3	8.64
2.400	1.200	140	2	5.76

Resistance 'R' Values

The resistance value of any thickness of Xtratherm PIR can be ascertained by simply dividing the thickness of the material (in metres) by it's agrèment declared lambda value 0.022 W/mk. *eg 50mm = 0.050/0.022 = R2.27*

Standards
Xtratherm products are manufactured under quality systems approved under EN ISO 9001: 2000.

Cutting
Xtratherm Thin-R Boards can be readily cut using a sharp knife or fine toothed saw.

Electrical Services
When running electric cables within insulation, advice given in the BRE publication “Thermal insulation: avoiding risks” and BS 7671: 2008 should be followed.

Durability
Xtratherm Thin-R is stable, rot proof and durable. It will remain an effective insulant for the life of the building.

Availability
Xtratherm Thin-R is available through Merchants and Distributors throughout the UK and Ireland. For the location of your nearest stockist contact Xtratherm.

Packaging
Xtratherm Thin-R is wrapped in polythene packs and each pack is labeled with details of grade/type, size and number of pieces per pack.

Handling & Storage
Xtratherm Thin-R should be stored off the ground, on a clean, flat surface and must be stored under cover. The polythene wrapping of Xtratherm Thin-R pack is not considered adequate protection for outside exposure.

Health & Safety
All Xtratherm products are safe to use and chemically inert. A Health & Safety information sheet is available from the Xtratherm Technical Support Department.

Technical Support
The Xtratherm Technical Support team provide a single point of contact to offer assistance on a wide range of issues for both the Designer and Builder and can be contacted by phone, fax or e-mail. Full details of all Xtratherm products, along with full technical literature can be downloaded from the web site at:

www.xtratherm.com

The Xtratherm range of high performance insulation boards provides the complete solution for newbuild and refurbishment.

Thin-R Sloped Roof Insulation

XT/PR
Effective insulation of roof area
Reduced insulation thickness
Reduces thermal bridging
Minimizes intrusion into living area

Thin-R Flat Roof Thermal Ply

FR-TP
Insulation & decking in one fix
For new & refurbishment roofs
Rapid weather proofing

Thin-R Partial Fill Cavity Wall Insulation

XT/CW
Robust tongue & groove jointing
Clear cavity maintained
Corner & reveal panels
Low emissivity foil facings
Extra thermal performance

Thin-R Insulation for Drylining Walls

XT/TL-MF
High thermal performance
Drylining & insulation in one fix
Shorter drying time
Responsive insulation system

Thin-R Built-in Cavity Fill Insulation

CT/PIR
Full Fill Insulation
Integral drainage facing
U-values as low as 0.16
Ultimate performance from traditional build

Thin-R Under Floor Insulation

XT/UF
Extra thermal performance
Suitable for under floor heating
Reduced insulation thickness
High compressive strength

Hyfloor Under Floor Insulation

XT/HYF
Extra thermal performance
Achieves 2006 standards
Construction friendly with T&G jointing
High Compressive Strength

Xtratherm®

Zero ODP
Zero Ozone Depletion Potential

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TR/COMP/UK/01-11