

The Irish Agrément Board is designated by Government to issue European Technical Approvals.

Irish Agrément Board Certificates establish proof that the certified products are **'proper materials'** suitable for their intended use under Irish site conditions, and in accordance with the **Building Regulations 1997 to 2002**.

The Irish Agrément Board operates in association with the **National Standards Authority of Ireland (NSAI)** as the National Member of UEAtc.

PRODUCT DESCRIPTION

This Certificate relates to the Xtratherm Thin-R Pitched Roof Board (XT^B/PR and XT/PR grades) using Polyisocyanurate (Polyiso), a thermoset closed cell rigid foam insulation manufactured in accordance with I.S. EN 13165:2001 *Thermal insulation products for buildings - factory made rigid polyurethane foam (PUR) products - Specification* (having regard to the description of Polyisocyanurate (PIR) in paragraph one of the Scope of standard). During the manufacturing process, liquid raw materials expanded by blowing agents are applied between trilaminate aluminium foil facings. This Certificate certifies compliance with the requirements of the Building Regulations 1997 to 2002.

USE

The product is used for the thermal insulation of pitched and tiled roofs constructed in accordance with I. S. ICP 2:2002 - *Code of Practice for Slating and Tiling*. It can be used between, below, below and between, above or above and between rafters. It also facilitates the control of surface and interstitial condensation in roofs.

MANUFACTURE AND MARKETING

The product is manufactured by **Xtratherm Limited** and marketed by **Hytherm (Sales) Limited** both of Kells Road, Navan, Co.Meath.

PART

1

CERTIFICATION

1.1 ASSESSMENT

In the opinion of the Irish Agrément Board (IAB), Xtratherm Pitched Roof Board if used in accordance with this certificate can meet the requirements of the Building Regulations 1997 to 2002 as indicated in Section 1.2 of this Agrément Certificate.

1.2 BUILDING REGULATIONS 1997 - 2002 REQUIREMENTS

PART D - Materials and Workmanship

D3 - Xtratherm XT^B/PR and XT/PR Pitched Roof Board as certified in this Irish Agrément certificate is comprised of proper materials fit for their intended use. (See Part 4 of this Certificate).

D1 - Xtratherm XT^B/PR and XT/PR Pitched Roof Board, as certified in this Irish Agrément Certificate, meets the requirements of the building regulations for workmanship.

PART B - FIRE SAFETY

B4 - External fire spread

Xtratherm XT^B/PR and XT/PR Pitched Roof Board will not affect the external fire rating of the roof in which it is incorporated.

PART C - SITE PREPARATION AND RESISTANCE TO MOISTURE.

C4 - Resistance to weather and ground moisture.

Xtratherm XT^B/PR and XT/PR Pitched Roof Board meet the requirements of this regulation, when installed as indicated in Section 2.4, in roofs constructed in compliance with the conditions indicated in Part 3 of this Certificate.

PART F – VENTILATION

F2 - Condensation in Roofs

Xtratherm XT^B/PR and XT/PR Pitched Roof Board meet the requirements of the Building Regulations 1997 to 2002, when designed and installed in accordance with Part 3 and Section 2.4 of this Certificate.

PART L - CONSERVATION OF FUEL AND ENERGY

L1 - Conservation of Fuel and Energy

Based on the measured thermal conductivity $\lambda = 0.019$ W/mK (and $\lambda = 0.023$ W/mK in the case of Xtratherm XT/PR), roofs incorporating Xtratherm XT^B/PR and XT/PR Pitched Roof Board can meet current 'U-value' requirements (see Section 4.6 of this Certificate).

PART

2

TECHNICAL SPECIFICATION AND CONTROL DATA

2.1 PRODUCT DESCRIPTION

Xtratherm XT^B/PR and XT/PR Pitched Roof Board consists of a rigid Polyisocyanurate (Polyiso) foam core with low emissivity trilaminate aluminium foil facings both sides. The boards edges are square or rebated. The system is an efficient single or double layer system combining insulation above and/or between and/or below rafters to form a roof that has many advantages over traditional methods of insulating at roof level providing a high level of thermal insulation in new and existing pitched roofs. Manufactured to I.S. EN 13165:2001 and tested to ensure compliance with the requirements for compressive strength, water vapour transmission, thermal conductivity, thermal resistance and dimensional stability.

Xtratherm XT^B/PR and XT/PR Pitched Roof Board are placed above and/or below and/or between rafters in conjunction with vapour permeable roof tile underlay, treated timber counter battens and tiling battens on pitched and mansard roofs, which have been designed in accordance with I. S. ICP 2:2002. The XT^B/PR board does not contain CFC's. The XT/PR board does not contain either CFC or HCFC gases and has zero Ozone Depletion Potential.

Table 1 shows the Xtratherm XT^B/PR and XT/PR Pitched Roof Board product range.

Table 1: Product Range

The boards are available in the following grades and sizes;	
Length:	2400 mm
Width:	1200 mm
Thickness:	25, 30, 35, 40, 45, 50, 55, 60, 65, 70, 75, 80, 90, 100 mm
Grade:	PIR
Other sizes are available subject to quantity.	

The following ancillary products are used with the boards;-

- Vapour permeable underlays used in conjunction with Xtratherm XT^B/PR and XT/PR Pitched Roof Board should be subject to current certification and installed in accordance with manufacturers recommendations for Warm Roof applications.

- Helifix Inskew or other approved proprietary fixings should be used in accordance with I. S. ICP 2:2002 and manufacturer's instructions.

Names of approved fixings and addresses of suppliers are available from Xtratherm Ltd.

2.2 MANUFACTURE

Xtratherm XT^B/PR and XT/PR Pitched Roof Board are manufactured from a formulation of chemicals which is poured onto the trilaminate facers, subsequently autohesively adhered to the facers during the foaming process and the resultant boards are then cut to the prescribed width and length.

Quality Control checks include board dimensions, density, dimensional stability, compressive strength and thermal conductivity.

2.3 DELIVERY, STORAGE AND MARKING

Xtratherm XT^B/PR and XT/PR Pitched Roof Board are polyethylene shrink-wrapped for delivery to site in packs. Each board has the manufacturer's name on its surface. Each pack carries a label bearing the CE Marking together with the product description, product characteristics (L and R values), manufacturer's name, IAB identification mark and IAB Certificate number for the system.

Installation instructions and details outlining the steps necessary to ensure proper installation are included in each pack.

Boards must be protected from prolonged exposure to sunlight, should be stored under cover in their original wrapping, not in contact with ground moisture and raised above ground level. Care must be taken to avoid contact with solvents and with materials containing volatile organic components such as coal tar, and newly treated timber.

The boards must not be exposed to a naked flame or other ignition sources.

2.4 INSTALLATION PROCEDURE

Installation must be in accordance with the relevant clauses of ICP 2:2002 and the manufacturer's instructions and can be carried out in all conditions normal for roof construction.

The Xtratherm XT^B/PR and XT/PR Pitched Roof Boards are light to handle and can be easily cut or shaped. The boards will not support the weight of operatives and care must be taken during tiling as indicated in the Company's Safety Notes.

Where the board is installed in Traditional and Timber Frame Construction cavity barriers at the junction of the external wall and roof space should be provided in accordance with the requirements of Part B of the Building Regulations 1997.

Procedure – single/double layer over rafters (Warm Roof)

1. Ensure that the XT^B/CW or XT/CW Partial Fill Wall Insulation has been continued to roof height to engage with the roof insulation. The insulation must be continuous to provide a complete envelope to reduce the risk of thermal bridging and condensation risk.
2. A treated timber stop rail, the same thickness as XT^B/PR and XT/PR insulation, is fixed to the rafters close to the eaves to provide a firm fixing point for the counter battens. The XT^B/PR and XT/PR boards are laid over the rafters commencing at the stop rail, the boards should be tightly butted and positioned in a staggered pattern with all the joints running from eaves to ridge occurring over the rafters. Repeat the procedure using crawling boards until the entire area from the eaves to ridge has been covered. The insulation will not support operatives. Any gaps in the insulation must be sealed with flexible sealant or expanding foam. Use large headed clout nails to hold boards temporarily in place until the counter battens secure them.
3. Treated counterbattens are fixed through the insulation into the rafter with Helifix Inskew (or other approved proprietary) fixings at the appropriate centres, taking account of the specific roof design e.g. pitch, weight of slates/tiles and location of the building.
4. The vapour permeable roof tile underlay is laid in accordance with its certification and manufacturers instructions.
5. Slating and tiling is installed in accordance with I. S. ICP 2: 2002. When the relevant space is to be used as a living area, the XT^B/PR and XT/PR board should be covered with 12.5 mm plasterboard.

Procedure - Double layer over and between rafters (Warm Roof)

XT^B/PR and XT/PR Pitched Roof Board insulation is used as a double layer when insulation values required create an excessive thickness for a single layer application.

The first layer of XT^B/PR and 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. The second layer over the rafters is applied as previously detailed in Single Layer (over rafter).

Procedure - Ventilated Roofs (Cold Roof)

Warm pitched roofs as described in the previous section may be the best solution for pitched roof insulation, but it is only suitable for new construction and some limited refurbishments where the roof covering is to be replaced. Placing the Xtratherm XT^B/PR and XT/PR Pitched Roof Board between and/or below the rafter is another solution.

This type of construction creates a 'Cold Roof' and because of the risk of interstitial condensation, building regulations require a continuous 50 mm ventilation space to be maintained between the insulation and the roof tile/slate underlay. This allows any moisture to be ventilated out of the construction.

Xtratherm XT^B/PR and XT/PR Pitched Roof Board may be used in pitched roof constructions where the insulation follows the slope of the roof and the mandatory 50 mm ventilation space is maintained. Care should be taken to ensure the ventilation space is not reduced and battens fixed to the rafters may be used as a retaining stop. In many constructions it may be necessary to fix only one layer of Xtratherm XT^B/PR or XT/PR between the rafters to achieve the relevant 'U value' however, where the requirement is for very low 'U values' or to reduce the effects of thermal bridging, a second layer fixed to the rafters over the first layer may be appropriate. As in the solution for the Warm Roof when the relevant space is to be used as a living area, the XT^B/PR and XT/PR board should be covered with 12.5mm plasterboard or an XT^B/TL or XT/TL Thermal Liner Board.

In accordance with building regulations, a 50 mm ventilation space should be maintained between the sarking felt and the insulation, unless a breather membrane is used allowing for a reduction in the recommended air-space. (Refer to manufacturers instruction and conditions of the certificate).

On-site trimming of boards where necessary to maintain continuity of insulation rooflights, roof windows or other opes is easily executed using a fine tooth saw or builder's knife.

Figures 1,2,3 and 4 show installation details.

Figure 1:
Ventilated roof detail XT/PR
pitched roof board

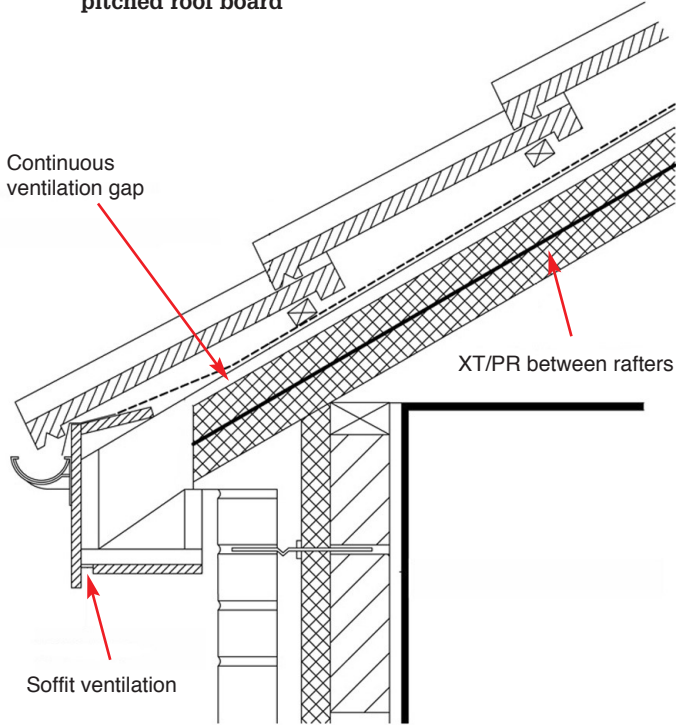


Figure 2: Warm roof detail

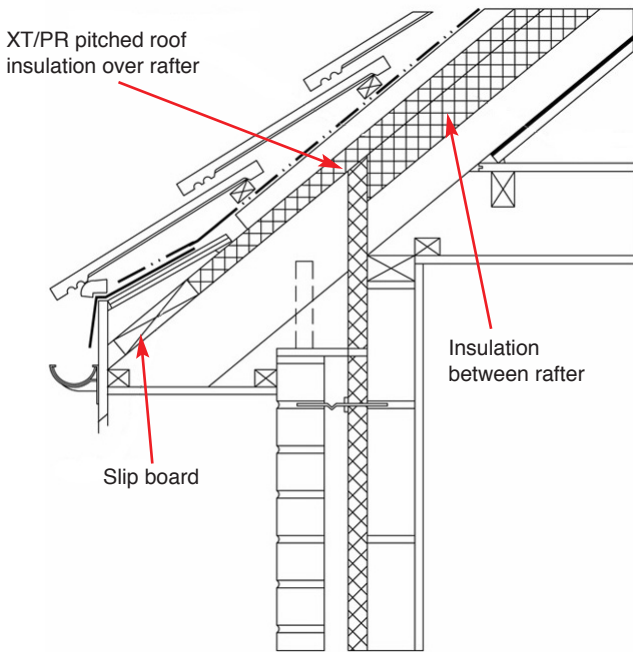


Figure 3:
Ventilated roof detail XT/PR
roof insulation

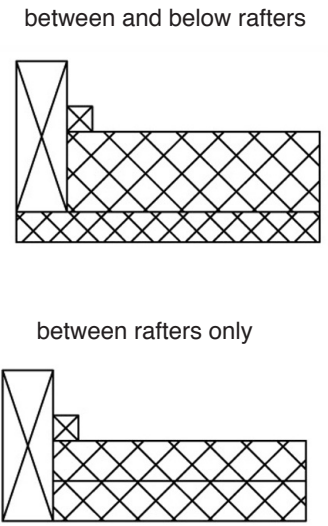
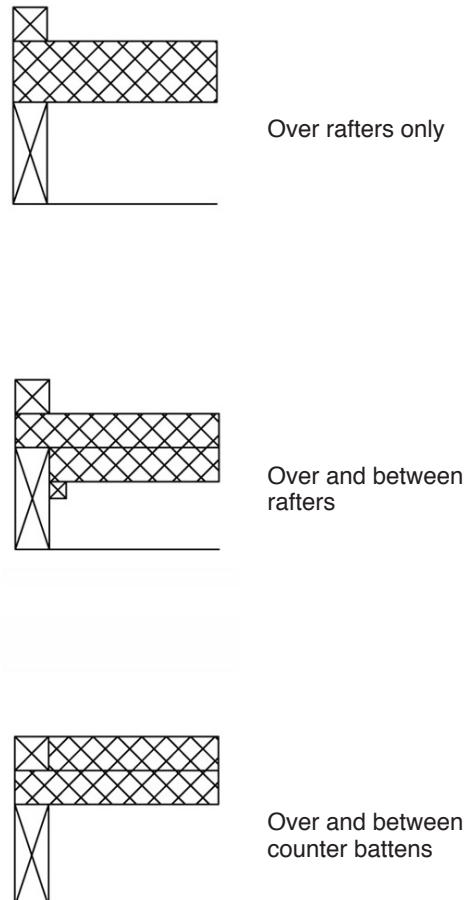


Figure 4:
Warm roof details XT/PR
pitched roof board



3 GENERAL

3.1 Xtratherm XT^B/PR and XT/PR Pitched Roof Board when installed in accordance with this Certificate, is effective in reducing the 'U' value (thermal transmittance) of new and existing pitched roof constructions. It is essential that such roofs are designed and constructed to prevent moisture penetration having regard to the Driving Rain Index.

3.2 Roofs subject to the relevant requirements of the Building Regulations 1997 to 2002 should be constructed in accordance with I. S. ICP 2: 2002.

3.3 When installed in accordance with this Certificate, Xtratherm XT^B/PR (or XT/PR) Pitched Roof Board will contribute to the buckling and racking strength of the roof as described in I. S. ICP 2: 2002. However, it is not recommended that they be considered as an alternative to cross bracing.

3.4 During installation, boards must not be walked on except over supporting timbers. The boards have insufficient nail holding ability to be considered as an alternative to timber sarking.

3.5 Roof tile underlays must be approved by the manufacturer or be the subject of a current Irish Agrément Certification for such use. Underlays should be installed in accordance with, and within the limits of that Certificate.

3.6 Moisture entering the roof must be minimised using a minimum of 500 gauge polyethylene with sealed gaps, placed under the inclined ceiling. Gaps in the ceiling should be minimised and service openings should be sealed.

4.1 BEHAVIOUR IN FIRE

- (i) Combustibility - Although Xtratherm XT^B/PR and XT/PR Pitched Roof Board is combustible, when used in the context of this Certificate the increase in fire load in the building consequent to its use, is small.
- (ii) The use of Xtratherm XT^B/PR and XT/PR Pitched Roof Board will not affect the fire rating obtained by the tiled/slatted roof when assessed or tested to BS 476; Part 3: 1958 *Fire tests on building materials and structures – External fire exposure roof test*.
- (iii) Toxicity - Negligible when used in protected roof situation.
- (iv) As Xtratherm XT^B/PR Pitched Roof Board is manufactured without the use of CFC's and Xtratherm XT/PR Pitched Roof Board without CFC's or HCFC's, there is no release of such gas on burning.

4.2 STRENGTH

Xtratherm XT^B/PR and XT/PR Pitched Roof Board when installed in accordance with the manufacturer's instructions, and this certificate, will resist the loads likely to be met during installation and in service.

4.3 RESISTANCE TO WIND LOAD

4.3.1. The resistance to wind uplift depends on many factors peculiar to each project. The effect of wind loading should be calculated in accordance with BS 6399: Part 2: 1997 *Loading for buildings – Code of practice for wind loads, including (AMD 13392) (AMD corrigendum 14009)*, using the appropriate basic wind speed shown on the map in Diagram 15 of TDG – A, Structure.

4.3.2 Xtratherm XT^B/PR and XT/PR Pitched Roof Board, when installed in accordance with section 2.4 of the Certificate, will have sufficient resistance to wind uplift.

4.4 RESISTANCE TO MOISTURE

Xtratherm XT^B/PR and XT/PR Pitched Roof Board will not be adversely affected by rain during installation or by wind driven snow or rain penetrating the tiling in service. Water absorption is low and the influence on the 'λ value' is minimal.

4.5 CONDENSATION RISK

The risk of interstitial condensation will be minimal under normal conditions of use. The boards have an intrinsically high vapour resistance and, when installed with tightly butted joints, filled/sealed joints and gaps will provide a continuous convection free envelope of high vapour resistance. Therefore, a suitable underlay may be laid over the insulation without ventilated airspace.

Where high humidity may be expected, a vapour control layer should be used unless a condensation risk assessment in accordance with BS 5250: 2002 shows that it is not necessary.

Guidance on preventing interstitial condensation from various sources is given in BRE Digest 369.

The risk of interstitial condensation is greatest when the building is drying out after construction. To prevent condensation problem arising, additional ventilation, other than normally required, may be needed.

Table 3: PITCHED ROOF CONSTRUCTIONS TYPICAL U-VALUES (Warm Roof)

	Insulation above rafter		Insulation above and between rafter		Insulation above and between battens	
	400 mm centres		400 mm centres		400 mm centres	
U value W/m ² K	XT ^B	XT	XT ^B	XT	XT ^B	XT
0.20	80	100	40/60	40/80	50/50	60/60
0.25	60	75	40/30	40/50	40/35	40/50
	600 mm centres		600 mm centres		600 mm centres	
0.20	80	100	40/60	40/75	50/50	50/60
0.25	60	75	40/30	40/40	40/35	40/50

Table 3: PITCHED ROOF CONSTRUCTIONS TYPICAL U-VALUES (Ventilated Roof)

	Insulation in slope of rafter 50mm airspace above		Insulation in slope of rafter 50mm airspace above	
	400 mm centres		400 mm centres	
U value W/m ² K	XT ^B	XT	XT ^B	XT
0.20	75 + 75	80 + 90	80/40	100/40
0.25	60 + 60	60 + 70	70/30	80/30
0.35	80	90	40/25	50/25
	600 mm centres		600 mm centres	
0.20	60 + 70	70 + 80	80/30	90/40
0.25	100	60 + 60	60/30	80/30
0.35	70	80	30/25	50/25

4.6 THERMAL INSULATION

The aged/design thermal conductivity 'λ value' of Xtratherm XT^B/PR and XT/PR Pitched Roof Board boards when measured in accordance with I.S. EN 12667 : 2000 *Thermal performance of building materials and products – Determination of thermal resistance by means of guarded hot plate and heat flow meters method – Products of high and medium thermal resistance*, is 0.019 W/mK for XT^B/PR and 0.023 W/mK for XT/PR.

The required maximum U-values for pitched roofs can be obtained with Xtratherm XT^B/PR and XT/PR Pitched Roof Board constructions as indicated in Table 3.

4.7 DURABILITY

Xtratherm XT^B/PR and XT/PR Pitched Roof Board are rot-proof and durable. As roof insulation, Xtratherm XT^B/PR and XT/PR Pitched Roof Board is judged to be stable and will remain effective as an insulation system for the life of the building, so long as it is installed in accordance with this certificate.

4.8 MAINTENANCE AND REPAIR

Damaged boards can be easily replaced prior to the installation of counter battens.

The product is light to handle and can be easily cut, but care must be taken to prevent damage. Since the board will not support the weight of operatives appropriate care must be taken during tiling/slating.

4.9 TESTS AND ASSESSMENTS

Tests and assessments were carried out to determine the following:

- density
- water vapour transmission
- long term water absorption
- dimensional accuracy
- compressive strength
- dimensional stability
- thermal conductivity
- efficiency of the construction process

The physical properties of Xtratherm Pitched Roof Board (PIR) are shown in Table 4

The management systems of Xtratherm Limited have been assessed and registered as meeting the requirements of ISO 9001:2000 by SGS Limited (Certificate number GB03/59360)

Table 4:
Physical Properties of Xtratherm Pitched Roof Board (PIR)

Property	Declared Value		Test Method
Long Term Water absorption by immersion	WL(T)2		EN 12087
Dimensional Stability	DS(TH)6		EN 1604
Density	32 Kg/m ³		EN 1602
Compressive Stress	> 150 kPa		EN 826
	XT^B / PR	XT / PR	
Thermal conductivity value	0.019 W/mK	0.023 W/mK	EN 12667
Thermal resistance			
– 35 mm	1.84 m ² K/W	1.52 m ² K/W	
– 40 mm	2.11 m ² K/W	1.74 m ² K/W	
– 50 mm	2.63 m ² K/W	2.17 m ² K/W	
– 60 mm	3.16 m ² K/W	2.61 m ² K/W	
– 80 mm	3.41 m ² K/W	3.48 m ² K/W	
– 100 mm	5.26 m ² K/W	4.35 m ² K/W	

5.1 CONDITIONS OF CERTIFICATION

The National Standards Authority of Ireland (“NSAI”) following consultation with the Irish Agrément Board (“IAB”) has assessed the performance and method of installation of the product/process and the quality of the materials used in its manufacture and certifies the product/process to be fit for the use for which it is certified provided that it is manufactured, installed, used and maintained in accordance with the descriptions and specifications set out in this certificate and in accordance with the manufacturer’s instructions and usual trade practice. This certificate shall remain valid so long as:

- (a) the specification of the product is unchanged;
- (b) the Building Regulations, 1997 to 2002 and any other regulation or standard applicable to the product/process, its use or installation remain unchanged;
- (c) the product continues to be assessed for the quality of its manufacture and marking by NSAI;
- (d) no new information becomes available, which in the opinion of the NSAI would preclude the granting of the certificate;
- (e) the product or process continues to be manufactured, installed, used and maintained in

accordance with the description, specifications and safety recommendations set out in this certificate.

- 5.2** The IAB mark and certification number may only be used on or in relation to products/processes in respect of which a valid certificate exists. If the certificate becomes invalid, the certificate holder must not use the IAB mark and certification number and must remove them from products already marked.
- 5.3** In granting this certificate, the NSAI makes no representation as to:
 - (a) the presence or absence of patent rights subsisting in the product/process; or
 - (b) the legal right of the certificate holder to market, install or maintain the product/process; or
 - (c) whether individual products have been manufactured or installed by the certificate holder in accordance with the descriptions and specifications set out in this certificate.
- 5.4** This certificate does not comprise installation instructions and does not replace the manufacturer’s directions or any professional or trade advice relating to use and installation which may be appropriate.

5.5 Any recommendations contained in this certificate relating to the safe use of the certified product or process are preconditions to the validity of the certificate. However, the NSAI does not certify that the manufacture or installation of the certified product or process in accordance with the descriptions and specifications set out in this certificate will satisfy the requirements of the Safety, Health and Welfare at Work Act, 1989 or of any other current or future statute or current or future common law duty of care owed by the manufacturer or by the certificate holder.

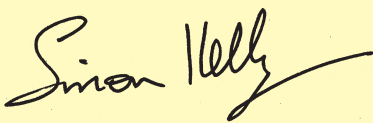
5.6 The NSAI is not responsible to any person or body for loss or damage, including personal injury, arising as a direct or indirect result of the use of this product or process.

5.7 Where reference is made in this certificate to any Act of the Oireachtas, regulation made thereunder, statutory instrument, code of practice, national standards, manufacturer's instructions or similar publication, it shall be construed as reference to such publication in the form in which it is in force at the date of this certification.

THE IRISH AGRÉMENT BOARD

This Certificate No. 03/0183 is accordingly granted by NSAI to Xtratherm Ltd. on behalf of The Irish Agrément Board.

Date of Issue: July 2003

Signed:  _____

Chief Executive, NSAI

Readers may check that the status of this Certificate has not changed by contacting the

Irish Agrément Board,
NSAI, Glasnevin, Dublin 9. Ireland.

Telephone: (01) 8073800.
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BUILDING PRODUCT CERTIFICATION

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