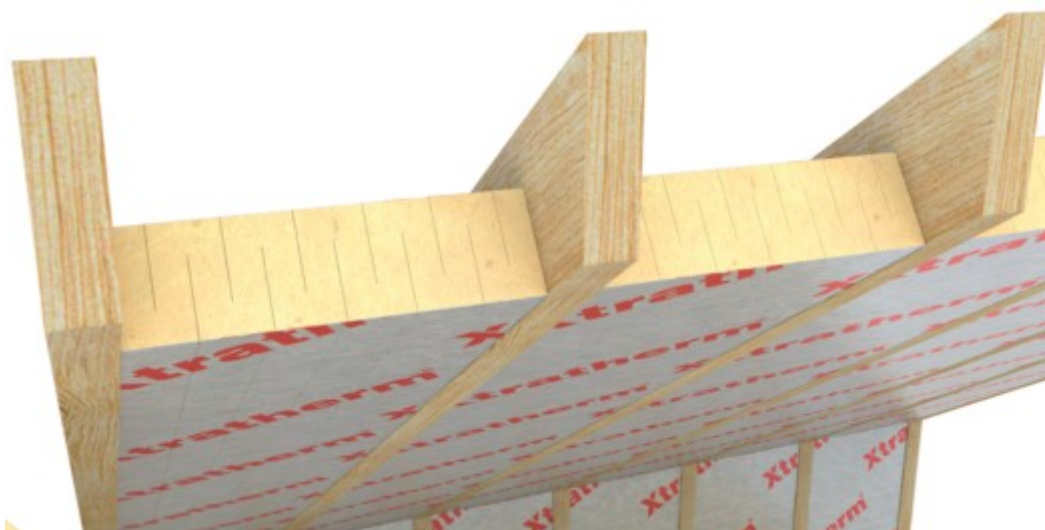


## Xtratherm Rafterloc Variable Width Pitched Roof Board

### Isolation Wärmedämmung

**NSAI Agrément (Irish Agrément Board)** is designated by Government to issue European Technical Approvals.

NSAI Agrément 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 2007**.



#### PRODUCT DESCRIPTION:

This Certificate relates to Xtratherm Rafterloc, a rigid polyisocyanurate modified polyurethane foam board manufactured in accordance with IS EN 13165:2001 *Thermal insulation products for buildings – Factory made rigid polyurethane foam (PUR) products – Specification* with a foil laminate facing on both sides. Xtratherm Rafterloc features a slotted mechanism that allows the board to lock between the rafters in pitched roof applications.

This Certificate certifies compliance with the requirements of the Building Regulations 1997 to 2007.

This Certificate is a confirmation of BBA Certificate No. 07/4402 issued by the British Board of Agrément, PO Box 195, Bucknalls Lane, Garston, Watford WD25 9BA.

#### USE:

The product is used for the thermal insulation of pitched and tiled roofs constructed in accordance with ICP 2:2002 *Code of practice for slating and tiling*. It can be used between, and between and under rafters. It also facilitates the control of surface and interstitial condensation in roofs.

#### MANUFACTURE AND MARKETING:

The product is manufactured and marketed by:

Xtratherm Ltd.,  
Kells Road,  
Navan,  
Co. Meath,  
Ireland  
Tel: +353 (0)46 90 66000  
Fax: +353 (0)46 90 66090  
Email: [info@xtratherm.com](mailto:info@xtratherm.com)

## 1.1 ASSESSMENT

In the opinion of NSAI Agrément, Xtratherm Rafterloc if used in accordance with this Certificate, meets the requirements of the Building Regulations 1997 - 2007 as indicated in Section 1.2 of this Certificate.

## 1.2 BUILDING REGULATIONS 1997 to 2007

### REQUIREMENT:

#### ***Part D – Materials and Workmanship***

**D3 – Xtratherm Rafterloc**, as certified in this Certificate, is comprised of proper materials fit for their intended use (See Part 4 of this Certificate).

**D1 – Xtratherm Rafterloc**, as certified in this Certificate, meets the requirements of the building regulations for workmanship.

#### ***Part B – Fire Safety***

##### **B4 – External Fire Spread**

Xtratherm Rafterloc 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 Rafterloc meets the requirements of this regulation when installed in accordance with this Certificate in roofs constructed in compliance with the conditions indicated in Part 3 of this Certificate.

#### ***Part F – Ventilation***

##### **F2 – Condensation in Roofs**

Xtratherm Rafterloc meets the requirements of the Building Regulations 1997 to 2007, when designed and installed in accordance with Section 2.4 and Part 3 of this Certificate.

#### ***Part L – Conservation of Fuel and Energy***

##### **L1 - Conservation of fuel and energy**

Based on the measured thermal conductivity 0.023W/mK, roofs incorporating Xtratherm Rafterloc can meet current 'U-value' requirement of 0.20W/m<sup>2</sup>K for pitched roofs with insulation on the slope (see Section 4.4 of this Certificate).

**2.1 PRODUCT DESCRIPTION**

Xtratherm Rafterloc consists of a rigid polyisocyanurate modified polyurethane foam board manufactured in accordance with IS EN 13165:2001 *Thermal insulation products for buildings – Factory made rigid polyurethane foam (PUR) products – Specification with a foil laminate facing on both sides*. The boards feature a slotted mechanism that allows the board to lock between the rafters in pitched roof applications.

Table 1 shows the Xtratherm Rafterloc product range.

<b>Length</b>	1200mm
<b>Width</b>	370mm
<b>Thickness</b>	75, 100, 125, 150mm
Other sizes are available	

**Table 1: Product Range**

**2.2 MANUFACTURE**

Xtratherm Rafterloc is manufactured from a formulation of chemicals, which is poured onto the foil facers subsequently autohesively bonded to the foam core during manufacture, and then cut to the prescribed width and length.

Quality control checks include board dimensions, squareness, flatness, alignment of facers, density, compressive strength and thermal conductivity.

**2.3 DELIVERY, STORAGE AND MARKING**

Xtratherm Rafterloc boards are supplied in polyethylene shrink-wrapped packs. Each pack carries a label with the product description, product characteristics ( $\lambda$  and R values), manufacturer's name, NSAI Agrément identification mark and NSAI Agrément Certificate number for the system.

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. If boards are stored outside, they should be raised above ground level and not in contact with ground moisture. 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**

**2.4.1 General**

Installation must be in accordance with the relevant clauses of ICP2:2002 and the manufacturer's instructions, and can be carried out in all conditions normal for roof construction.

The boards can be cut using a sharp knife or fine-toothed saw. Xtratherm Rafterloc boards will not support the weight of operatives and care must be taken during tiling of the roof.

Cavity barriers should be provided at the junction of the external wall and roof space in accordance with the requirements of Part B of the Building Regulations 1997 to 2007.

**2.4.2 Procedure – Between Rafter Layer of Insulation**

Following completion of roof cladding, friction fit Xtratherm Rafterloc insulation to sit flush with the underside of the rafters whilst maintaining the ventilation gap.

If required, the Xtratherm Rafterloc board can be cut with a trimming knife to fit areas that are closer than the standard spacing. The board should be cut accurately to facilitate tight fitting. Care should be taken to avoid thermal bridging at roof-wall junctions at eaves, gable walls and party walls. Complete installation as described to vertical studding and ceiling collars. A suitable vapour control layer should be fixed to the underside of the rafters at this stage.

**2.4.3 Procedure – Between and Below Rafter Layer of Insulation**

A second layer of NSAI Agrément approved Xtratherm XT/PR insulation can be fitted beneath the rafters. The XT/PR board should be butted tightly against adjoining panels and temporarily fixed to the underside of the rafter with large headed clout nails. A suitable vapour control layer should be provided between the XT/PR board and the internal finish.



**Figure 1: Installation of Xtratherm Rafterloc between rafters**

### 3. GENERAL

Xtratherm Rafterloc 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.

Roofs subject to the relevant requirements of the Building Regulations 1997 to 2007 should be constructed in accordance with ICP 2:2002.

Although Xtratherm Rafterloc will contribute to the buckling and racking strength of the roof as described in ICP 2:2002, normal cross-bracing must be incorporated.

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

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

Combustibility - Although Xtratherm Rafterloc is not classified as non-combustible, when used in the context of this Certificate the increase in fire load in the building consequent to its use, is negligible.

The use of Xtratherm Rafterloc will not affect the fire rating obtained by the tiled/slatted roof when assessed or tested to BS 476-3:2004 *Fire tests on building materials and structures – Classification and method of test for external fire exposure to roofs*.

Toxicity – Negligible when used in protected roof construction.

#### 4.2 STRENGTH

Xtratherm Rafterloc 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

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 6399-2:1997 *Loading for buildings – Code of practice for wind loads*, using the appropriate basic wind speed shown on the map in Diagram 15 of TGD to Part A of the Building Regulations 1997 to 2007.

Xtratherm Rafterloc when installed in accordance with Section 2.4 of this Certificate will have sufficient resistance to wind uplift.

#### 4.4 RESISTANCE TO MOISTURE

Xtratherm Rafterloc will not be adversely affected by rain during installation for a limited time scale or by wind driven snow or rain penetrating the tiling in service.

#### 4.5 CONDENSATION RISK

The risk of interstitial condensation will be minimal under normal conditions of use. Xtratherm Rafterloc boards have a high water vapour resistance and when installed in accordance with this Certificate will provide a convection-free envelope of high vapour resistance. In these circumstances, or where a vapour control layer is used, a suitable NSAI Agrément approved vapour permeable roof tile underlay may be laid over the insulation boards without a ventilated air space. Where high vapour resistance roof tile underlays are used, ventilation to the air space should be considered in accordance with the recommendations of BNS 5250:2002 *Code of practice for the control of condensation in buildings* and the relevant NSAI Agrément certificate for the roof tile underlay.

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

#### 4.6 THERMAL INSULATION

The aged thermal conductivity ' $\lambda$ ' value of Xtratherm Rafterloc, when measured in accordance with IS EN 12667:2001, is 0.023W/mK. The required maximum U-values for pitched roofs which can be obtained with Xtratherm Rafterloc constructions are indicated in Table 2.

The DoEHLG publication *Limiting Thermal Bridging & Air Infiltration – Acceptable Construction Details* gives guidance on limiting cold bridging and should be referred to.

#### 4.7 TESTS AND ASSESSMENTS WERE CARRIED OUT TO DETERMINE THE FOLLOWING:

- Density
- Water vapour transmission
- Long term water absorption
- Dimensional accuracy
- Compressive and cross breaking strength
- Dimensional stability
- Thermal conductivity
- Efficiency of the construction process

#### 4.8 OTHER INVESTIGATIONS

- (i) Existing data on product properties in relation to fire, toxicity, environmental impact and the effect on mechanical strength/stability and durability were assessed.
- (ii) The manufacturing process was examined including the methods adopted for quality control, and details were obtained of the quality and composition of the materials used.
- (iii) Site visits were conducted to assess the practicability of installation and the history of performance in use of the product.
- (iv) A condensation risk analysis was performed.

Rafterloc thickness between rafters	Thickness of insulation below rafters				
	30mm	40mm	50mm	60mm	70mm
75mm	0.23	0.21	0.19	0.18	0.16
100mm	0.20	0.18	0.17	0.16	0.15
125mm	0.18	0.16	0.15	0.14	0.13
150mm	0.16	0.15	0.14	0.13	0.12

U-values in pale squares comply with Building Regulations requirement of maximum U-value of 0.20W/m<sup>2</sup>K for pitched roofs with insulation on the slope

**Table 2: Typical U Values using Xtratherm Raferloc between rafters @ 400mm centres**

**5.1** National Standards Authority of Ireland ("NSAI") following consultation with NSAI Agrément 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 for five years from date of issue so long as:

- (a) the specification of the product is unchanged.
- (b) the Building Regulations 1997 to 2007 and any other regulation or standard applicable to the product/process, its use or installation remains 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.
- (f) the registration and/or surveillance fees due to NSAI Agrément are paid.

**5.2** The NSAI Agrément mark and certification number may only be used on or in relation to product/processes in respect of which a valid Certificate exists. If the Certificate becomes invalid the Certificate holder must not use the NSAI Agrément mark and certification number and must remove them from the products already marked.

**5.3** In granting Certification, the NSAI makes no representation as to;

- (a) the absence or presence 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/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 2005, or of any other 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.

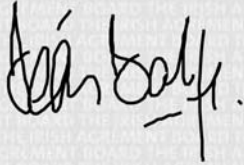
**5.7** Where reference is made in this Certificate to any Act of the Oireachtas, Regulation made thereunder, Statutory Instrument, Code of Practice, National Standards, manufacturer's instructions, or similar publication, it shall be construed as reference to such publication in the form in which it is in force at the date of this Certification.

## NSAI Agrément

This Certificate No. **08/0326** is accordingly granted by the NSAI to **Xtratherm Ltd.** on behalf of NSAI Agrément.

Date of Issue: **October 2008**

Signed



**Seán Balfe**  
Director of NSAI Agrément

Readers may check that the status of this Certificate has not changed by contacting NSAI Agrément , NSAI, 1 Swift Square, Northwood, Santry, Dublin 9, Ireland. Telephone: (01) 807 3800. Fax: (01) 807 3842. [www.n Sai.ie](http://www.n Sai.ie)