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Agrément Certificate
11/4817
Product Sheet 1

XTRATHERM THIN-R INSULATION

XTRATHERM THIN-R FLAT ROOF INSULATION BOARD (FR ALU)

PRODUCT SCOPE AND SUMMARY OF CERTIFICATE

This Certificate relates to Xtratherm Thin-R Flat Roof Insulation Board (FR Alu), a rigid thermoset polyisocyanurate foil faced insulation for use as a thermal insulation layer and to create or improve falls on limited access concrete, metal or timber flat roof decks. It is for use in conjunction with a vapour control layer and a single ply mechanically fixed roof waterproofing membrane in domestic and non-domestic buildings.

AGRÉMENT CERTIFICATION INCLUDES:

- factors relating to compliance with Building Regulations where applicable
- factors relating to additional non-regulatory information where applicable
- independently verified technical specification
- assessment criteria and technical investigations
- design considerations
- installation guidance
- regular surveillance of production
- formal three-yearly review.

KEY FACTORS ASSESSED

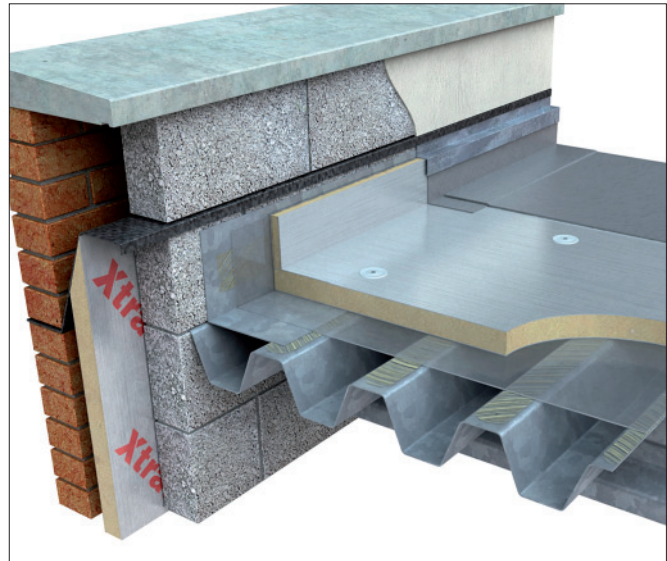
Thermal performance — the product has a declared thermal conductivity ($\lambda_{90/90}$ value) of $0.022 \text{ W}\cdot\text{m}^{-1}\cdot\text{K}^{-1}$ and calculations for 'typical' roof constructions indicate U values between $0.13 \text{ W}\cdot\text{m}^{-2}\cdot\text{K}^{-1}$ to $0.25 \text{ W}\cdot\text{m}^{-2}\cdot\text{K}^{-1}$ (see section 5).

Condensation risk — the product can contribute to limiting the risk of surface condensation (see section 6).

Strength and stability — when installed on suitable substrates using appropriate fixings, the product can adequately transfer maintenance traffic loads and wind loads to the roof deck (see section 7).

Behaviour in relation to fire — the fire rating of any roof containing the boards will depend on the type of deck and the nature of the roof waterproof covering (see section 8).

Durability — the product, when used as thermal insulation in the roof system described in this Certificate, will have a life at least as long as that of a roof waterproofing covering (see section 10).



The BBA has awarded this Agrément Certificate to the company named above for the product described herein. This product has been assessed by the BBA as being fit for its intended use provided it is installed, used and maintained as set out in this Certificate.

On behalf of the British Board of Agrément

A handwritten signature in black ink, appearing to read 'Simon Wroe'.

Simon Wroe
Head of Approvals — Physics

A handwritten signature in black ink, appearing to read 'Greg Cooper'.

Greg Cooper
Chief Executive

Date of First issue: 28 February 2011

The BBA is a UKAS accredited certification body — Number 113. The schedule of the current scope of accreditation for product certification is available in pdf format via the UKAS link on the BBA website at www.bbacerts.co.uk

Readers are advised to check the validity and latest issue number of this Agrément Certificate by either referring to the BBA website or contacting the BBA direct.

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Regulations

In the opinion of the BBA, Xtratherm Thin-R Flat Roof Insulation Board (FR Alu), if used in accordance with the provisions of this Certificate, will meet or contribute to meeting the relevant requirements of the following Building Regulations:



The Building Regulations 2010 (England and Wales)

Requirement:	A1	Loading
Comment:		The product is acceptable. See section 7.1 of this Certificate.
Requirement:	B4(2)	External fire spread
Comment:		Roofs incorporating the product can meet this Requirement. See section 8.2 of this Certificate.
Requirement:	C2(c)	Resistance to moisture
Comment:		The product will contribute to a roof meeting this Requirement. See sections 6.1 and 6.3 of this Certificate.
Requirement:	L1(a)(i)	Conservation of fuel and power
Comment:		The product can meet or contribute to a roof meeting this Requirement. See sections 5.2 and 5.3 of this Certificate.
Requirement:	Regulation 7	Materials and workmanship
Comment:		The product is an acceptable material. See section 10 and the <i>Installation</i> part of this Certificate.



The Building (Scotland) Regulations 2004 (as amended)

Regulation:	8(1)	Fitness and durability of materials and workmanship
Comment:		The product can contribute to a construction satisfying this Regulation. See section 10 and the <i>Installation</i> part of this Certificate.
Regulation:	9	Building Standards – construction
Standard:	1.1	Structure
Comment:		The product is acceptable, with reference to clauses 1.1.1 ⁽¹⁾⁽²⁾ , 1.1.2 ⁽¹⁾⁽²⁾ and 1.1.3 ⁽¹⁾⁽²⁾ . See section 7.1 of this Certificate.
Standard:	2.8	Spread from neighbouring buildings
Comment:		Roofs incorporating the product can meet this Standard, with reference to clauses 2.8.1 ⁽¹⁾⁽²⁾ . See section 8.2 of this Certificate.
Standard:	3.15	Condensation
Comment:		The product will contribute to a roof meeting this Standard, with reference to clauses 3.15.1 ⁽¹⁾⁽²⁾ , 3.15.3 ⁽¹⁾⁽²⁾ , 3.15.4 ⁽¹⁾⁽²⁾ , 3.15.5 ⁽¹⁾⁽²⁾ and 3.15.6 ⁽¹⁾⁽²⁾ . See sections 6.1 and 6.4 of this Certificate.
Standard:	6.1(b)	Carbon dioxide emissions
Standard:	6.2	Building insulation envelope
Comment:		The product can contribute to satisfying the requirements of these Standards, with reference to clauses, or parts of 6.1.2 ⁽²⁾ , 6.1.6 ⁽¹⁾ , 6.2.1 ⁽¹⁾⁽²⁾ , 6.2.3 ⁽¹⁾ , 6.2.4 ⁽²⁾ , 6.2.5 ⁽²⁾ , 6.2.6 ⁽¹⁾ , 6.2.7 ⁽¹⁾ , 6.2.8 ⁽¹⁾⁽²⁾ , 6.2.9 ⁽¹⁾⁽²⁾ , 6.2.10 ⁽¹⁾⁽²⁾ , 6.2.11 ⁽¹⁾⁽²⁾ , 6.2.12 ⁽²⁾ and 6.2.13 ⁽¹⁾⁽²⁾ . See sections 5.2 and 5.3 of this Certificate.
Regulation:	12	Building standards – conversions
Comment:		All comments given for this product under Regulation 9, also apply to this Regulation, with reference to clause 0.12.1 ⁽¹⁾⁽²⁾ and Schedule 6 ⁽¹⁾⁽²⁾ . (1) Technical Handbook (Domestic). (2) Technical Handbook (Non-Domestic).



The Building Regulations (Northern Ireland) 2000 (as amended)

Regulation:	B2	Fitness of materials and workmanship
Comment:		The product is acceptable. See section 10 and the <i>Installation</i> section of this Certificate.
Regulation:	C5	Condensation
Comment:		The product will contribute to a roof meeting this Regulation. See section 6.1 of this Certificate.
Regulation:	D1	Stability
Comment:		The product is acceptable. See section 7.1 of this Certificate.
Regulation:	E5(b)	External fire spread
Comment:		Roofs incorporating the product can meet this Regulation. See section 8.2 of this Certificate.
Regulation:	F2(a)(i)	Conservation measures
Regulation:	F3(2)	Target carbon dioxide Emissions Rate
Comment:		Roofs incorporating the product can satisfy or contribute to satisfying this Regulation. See sections 5.2 and 5.3 of this Certificate.

Construction (Design and Management) Regulations 2007

Construction (Design and Management) Regulations (Northern Ireland) 2007

Information in this Certificate may assist the client, CDM co-ordinator, designer and contractors to address their obligations under these Regulations.

See section: 2 *Delivery and site handling* (2.5) of this Certificate.

Non-regulatory Information

NHBC Standards 2011

NHBC accepts the use of Xtratherm Thin-R Flat Roof Insulation Board (FR Alu), when installed and used in accordance with this Certificate, in relation to *NHBC Standards, Chapter 7.1 Flat roofs and balconies*.

Technical Specification

1 Description

1.1 Xtratherm Thin-R Flat Roof Insulation Board (FR Alu) is a rigid thermoset polyisocyanurate insulation board manufactured using CFC/HCFC free materials, incorporating composite foil facings on both sides.

1.2 Boards have the nominal characteristics as shown in Table 1.

Length and width (mm)	1200 by 600 or 2400 by 1200
Thickness (mm)	25 – 165 (in 5 mm increments)
Compressive strength at 10% compression (kPa)	150
Density (kg·m ⁻³)	30
Edge profile	Square, rebated

1.3 Boards are also available in a tapered version for falls of 1:120, 1:80 and 1:60 (1200 mm by 1200 mm).

1.4 Quality control checks are carried out during the manufacturing process and on finished boards.

1.5 The product is installed as part of a roof system in conjunction with the following items:

- mechanically fixed single-ply roof waterproofing membrane
- vapour control layer
- fixings — incorporating countersunk washer.

2 Delivery and site handling

2.1 Boards are delivered to site in packs shrink-wrapped in polythene. Each pack carries a label bearing the company's name, product code and batch number.

2.2 Boards must be stored flat, off the ground on a clean, level surface under cover to protect them from precipitation.

2.3 Boards must be protected from prolonged exposure to sunlight by storing either under cover or by covering with opaque polythene sheets or waterproof tarpaulin. Where possible, the boards should be stored inside a building.

2.4 Boards that have been allowed to get wet should not be used.

2.5 Boards must not be exposed to naked flame or other ignition sources.

Assessment and Technical Investigations

The following is a summary of the assessment and technical investigations carried out on Xtratherm Thin-R Flat Roof Insulation Board (FR Alu).

Design Considerations

3 General

3.1 Xtratherm Thin-R Flat Roof Insulation Board (FR Alu) is suitable for use as a thermal insulation layer on concrete, metal or timber flat roofs, with access limited to maintenance only.

3.2 Decks should be designed in accordance with the relevant clauses of either BS 6229 : 2003 or BS 8217 : 2005 and, where appropriate, the *NHBC Standards 2011, Chapter 7.1, Section 4*.

3.3 Roofs should incorporate an effective vapour control layer below the boards.

3.4 Boards are for use with mechanically fixed single-ply waterproofing membranes, such as PVC, CSM, CPE, FPO (including TPO), VEA, PIB and EPDM, which are the subject of a current Agrément Certificate, laid in accordance with, and within, the limitations imposed by that Certificate.

3.5 Limited access roofs are defined for the purpose of this Certificate as those roofs subject only to pedestrian traffic for maintenance of the roof covering and cleaning of gutters, etc (see also section 7.11).

3.6 Flat roofs are defined for the purpose of this Certificate as those roofs having a minimum finished fall of 1:80 and a maximum 1:6 as defined in BS 6229 : 2003.

3.7 For design purposes on flat roofs, twice the minimum finished fall should be assumed, unless a detailed analysis of the roof is available, including overall and local deflections, direction of falls etc.

3.8 Tapered boards may be used where appropriate to achieve the minimum finished falls required.

3.9 Boards have not been assessed for use with built-up bitumen based roofing or mastic asphalt systems.

4 Practicability of installation

The product is designed to be installed by a competent general builder, or a contractor, experienced with this type of product.

5 Thermal performance

5.1 Calculations of thermal transmittance (U value), should be carried out in accordance with BS EN ISO 6946 : 2007 and BRE Report (BR 443 : 2006) *Conventions for U-value calculations*, using a declared thermal conductivity ($\lambda_{90/90}$ value) of $0.022 \text{ W}\cdot\text{m}^{-1}\cdot\text{K}^{-1}$.



5.2 The U value of a completed roof will depend on the thickness of insulation used, the number and type of fixings and the insulating value of other roof components/layers. Example U values of roofs incorporating the product are shown in Tables 2 and 3, and typical design U values are shown in Tables 4 to 6.

Table 2 Example U values for constructions with galvanised steel fixings ($\text{W}\cdot\text{m}^{-2}\cdot\text{K}^{-1}$)

Concrete ⁽²⁾⁽³⁾	Insulation thickness ⁽¹⁾ (mm)		U value ($\text{W}\cdot\text{m}^{-2}\cdot\text{K}^{-1}$)
	Timber ⁽²⁾⁽⁴⁾	Metal ⁽²⁾⁽⁵⁾	
—	165	—	0.15
—	155	—	0.16
150	135	155	0.18
135	120	140	0.20
110	95	110	0.25

(1) Nearest available thickness.

(2) Includes 5.55 galvanised steel insulation fixings per m^2 and 3.55 galvanised steel waterproofing fixings per m^2 , with a 4.8 mm cross sectional diameter.

(3) 150 mm concrete decking $1.33 \text{ W}\cdot\text{m}^{-1}\cdot\text{K}^{-1}$, VCL, 1.5 mm waterproofing membrane.

(4) 12.5 mm plasterboard, 150 mm timber joists (12.5%)/air cavity (87.5%), 18 mm plywood decking, VCL, 1.5 mm waterproofing membrane.

(5) Metal deck (not included in calculation), VCL, 1.5 mm waterproofing membrane.

Table 3 Example U values for constructions with stainless steel fixings ($\text{W}\cdot\text{m}^{-2}\cdot\text{K}^{-1}$)

Concrete ⁽²⁾⁽³⁾	Insulation thickness ⁽¹⁾ (mm)		U value ($\text{W}\cdot\text{m}^{-2}\cdot\text{K}^{-1}$)
	Timber ⁽²⁾⁽⁴⁾	Metal ⁽²⁾⁽⁵⁾	
—	165	—	0.13
155	145	155	0.15
145	135	145	0.16
130	120	130	0.18
115	105	115	0.20
90	85	95	0.25

(1) Nearest available thickness.

(2) Includes 5.55 stainless steel insulation fixings per m^2 and 3.55 stainless steel waterproofing fixings per m^2 , with a 4.8mm cross sectional diameter.

(3) 150 mm concrete decking $1.33 \text{ W}\cdot\text{m}^{-1}\cdot\text{K}^{-1}$, VCL, 1.5 mm waterproofing membrane.

(4) 12.5 mm plasterboard, 150 mm timber joists (12.5%)/air cavity (87.5%), 18 mm plywood decking, VCL, 1.5 mm waterproofing membrane.

(5) Metal deck (not included in calculation), VCL, 1.5 mm waterproofing membrane.

Table 4 Mean design roof U values — England and Wales⁽¹⁾

Construction	U value (W·m ⁻² ·K ⁻¹)
Notional dwelling	0.16
Existing building – new, replaced, renovated or retained roof	0.18
Notional non-domestic building	0.18
Dwelling new-build limit	0.20
Non-domestic new-build limit	0.25

(1) Flexible approaches on existing buildings are given in the Approved Documents.

Table 5 Mean design roof U values – Scotland⁽¹⁾

Construction	U value (W·m ⁻² ·K ⁻¹)
Notional dwelling	0.13
New dwelling simplified method	0.13
Conversion unheated building (into dwellings)	0.15
Extension to dwelling	0.15
New non-dwellings limit for shell and fit out	0.15
Conversion of unheated building	0.15
Non-domestic extension, alterations and reconstructions	0.15
Alterations and reconstructions to a dwelling	0.18
Stand-alone building < 50 m ² to a dwelling	0.18
New dwelling limit	0.18
New non-domestic limit	0.20
Conversion of heated building	0.25
Notional non-dwelling	0.25

(1) Flexible approaches on existing buildings are given in the Technical Handbooks.

Table 6 Mean design roof U values – Northern Ireland⁽¹⁾

Construction	U value (W·m ⁻² ·K ⁻¹)
Notional dwelling	0.16
Existing building – new roof	0.20
Building new-build limit	0.25
Notional non-domestic building	0.25
Existing building – replaced, renovated or retained roof	0.25

(1) Flexible approaches on existing buildings are given in the Technical Booklets.

5.3 The product can contribute to maintaining continuity of thermal insulation at junctions between elements and openings. For Accredited Construction Details the corresponding psi values in BRE Information Paper IP1/06 *Assessing the effects of thermal bridging at junctions and around openings*, Table 3 may be used in carbon emission calculations in Scotland and Northern Ireland. Detailed guidance for other junctions and on limiting heat loss by air infiltration can be found in:

England and Wales — Approved Documents to Part L and for new thermal elements to existing buildings, Accredited Construction Details (version 1.0). See also SAP 2009 Appendix K and the *iSBEM User Manual* for new-build

Scotland — Accredited Construction Details (Scotland)

Northern Ireland — Accredited Construction Details (version 1.0).

6 Condensation risk

Interstitial condensation



6.1 Roofs will adequately limit the risk of interstitial condensation when they are designed and constructed in accordance with BS 5250 : 2002, Section 8.4 and Appendix D and BRE Report (BR 262 : 2002) *Thermal insulation: avoiding risks* in England and Wales.

6.2 For the purposes of assessing the risk of interstitial condensation, the insulation core vapour resistivity may be taken as approximately $300 \text{ MN}\cdot\text{s}\cdot\text{g}^{-1}\cdot\text{m}^{-1}$ and a resistance value of $1000 \text{ MN}\cdot\text{s}\cdot\text{g}^{-1}$ for each foil facing.

Surface condensation



6.3 Roofs will adequately limit the risk of surface condensation when the thermal transmittance (U value) does not exceed $0.35 \text{ W}\cdot\text{m}^{-2}\cdot\text{K}^{-1}$ at any point and the junctions with other elements are designed in accordance with section 5.3.



6.4 Roofs will adequately limit the risk of surface condensation when the thermal transmittance (U value) does not exceed $1.2 \text{ W}\cdot\text{m}^{-2}\cdot\text{K}^{-1}$ at any point. Guidance may be obtained from BS 5250 : 2002, Section 8 and BRE Report (BR 262 : 2002).

7 Strength and stability



7.1 When installed on suitable flat roof decks, using appropriate fixings, the product can adequately transfer maintenance traffic loads and negative and positive (suction and pressure) wind loads to the roof deck.

7.2 The roof construction or immediate substrate to which the boards are fixed must be structurally sound and have sufficient strength and stability, to resist all dead, imposed and wind loads. It must also have adequate resistance to the pull-out forces created by the wind forces acting on the specified fixings used.

7.3 The suitability of the roof construction, and in particular the immediate substrate, for any specified mechanical fixings must be checked before installation by carrying out in-situ pull-out or pull-through testing to determine the minimum safe working load the fixings can resist. The advice of the Certificate holder should also be sought in respect of suitable mechanical fixings.

7.4 The type and number of fixings will depend on the roof construction and location; the Certificate holder's advice should be sought in this respect. The Certificate holder recommends a minimum number of fixings per board size, see section 12.4.

7.5 All design analysis must be in accordance with British or European Standards relevant to the construction. The requirement for fixings to suit the wind uplift requirements for the particular site should be assessed in accordance with BS 6399-2 : 1997 or BS EN 1991-1-4 : 2005. All calculations should be carried out by a suitably qualified Chartered Engineer.

7.6 Each fixing must incorporate a head or washer which is a minimum of 50 mm diameter if round or 50 mm by 50 mm if square. Fixings installed along the edges or at corners of boards should be between 50 mm to 150 mm from the board edge (210 mm for tapered boards).

7.7 Roof waterproof covering systems (see section 3.4 for suitable types) must be applied in accordance with the relevant Agrément Certificates or manufacturers guidance.

7.8 For design purposes, the boards may be assumed to have an allowable compressive strength of 150 kPa at 10% compression.

7.9 Boards have not been assessed for use with permanent distributed or concentrated loads, such as air conditioning units, mechanical plants, water tanks, etc. Such loads should be supported directly on the roof construction. The product is not suitable when permanent roof access is required.

7.10 When profiled decking is used, boards will need to span across the ribs. Maximum permissible spans between ribs for board thicknesses are shown in Table 7.

Table 7 Maximum clear span

Maximum clear span (mm)		Minimum roofboard thickness (mm)
< 75		25
> 75	≤ 100	30
> 100	≤ 125	35
> 125	≤ 150	40
> 150	≤ 175	45
> 175	≤ 200	50
> 200	≤ 225	55
> 225	≤ 250	60

7.11 When maintenance is required to the roof waterproofing, protective boarding should be laid over the roof surface to avoid concentrations of load.

8 Behaviour in relation to fire

8.1 The fire rating of any roof containing the boards will depend on the type of deck and the nature of the roof waterproof covering.



8.2 When tested in accordance with BS 476-3 : 2004, a system comprising 0.7 mm thick profiled metal deck, a polythene vapour control layer, a 100 mm thick board and a layer of 1.2 mm Xenith PVC membrane mechanically fastened, achieved an EXT.F.AB (Low vulnerability in Scotland) rating and is acceptable less than 6 m from a relevant boundary.

8.3 The designation of other specifications, eg when used on combustible substrates, should be confirmed by:

England and Wales — test or assessment in accordance with Clause 6 of Appendix A of Approved Document B, volumes 1 and 2

Scotland — test to conform to clauses 2.C⁽¹⁾ and 2.F⁽²⁾

(1) Technical Handbook (Domestic).

(2) Technical Handbook (Non-Domestic).

Northern Ireland — test or assessment by a UKAS accredited laboratory, or an independent consultant with appropriate experience.

9 Maintenance

No maintenance of the insulation layer will be required provided the roof waterproof covering remains intact.

10 Durability



The board is rot-resistant and durable, and will have a life at least as long as that of the roof waterproof covering.

Installation

11 General

11.1 Xtratherm Thin-R Flat Roof Insulation Board (FR Alu) must be installed in accordance with the Certificate holder's instructions and BS 6229 : 2003, BS 8217 : 2005, or the relevant Agrément Certificate, depending on the waterproofing to be applied.

11.2 Care should be taken to ensure the deck is graded to the correct falls, is dry, clean and free from any projections or gaps.

11.3 If tapered boards are to be effective in providing a uniform fall it is essential that the structural deck is true and even. Any hollows, depressions, backfalls, found in the roof deck, eg must be rectified prior to laying the insulation.

11.4 The suitability of the substrate to accept and retain mechanical fixings must be checked prior to work commencing.

11.5 The deck to which the vapour control layer is to be applied must be level, dry, sound, and if bonded, free from dust and grease and other defects which may impair the bond.

11.6 On multi-storey buildings or in areas subject to high wind loads, additional mechanical fixings may be required and the advice of the Certificate holder should be sought on any limitations of use.

11.7 The mechanical fixing frequency and pattern should be predetermined in accordance with the Certificate holder's instructions and the relevant clauses of BS 6399-2 : 1997 or BS EN 1991-1-4 : 2005. Each fixing should incorporate a minimum 50 mm x 50 mm square or a 50 mm diameter circular plate countersunk washer, which must not restrain more than one board.

11.8 To prevent moisture being trapped on, or in the insulation it is essential to:

- protect the boards during laying, before the application of the roof waterproofing, or to lay the roof covering at the same time as laying the boards. However boards accidentally wetted, must be replaced or allowed to dry fully before application of the waterproof layer
- boards should be installed only when the ambient temperature is above 5°C to prevent condensation.

11.9 Boards can be cut with a sharp knife or fine-toothed saw to fit around projections through the roof.

11.10 Boards are for use with the waterproofing membranes specified in section 3.4, that are subject of a current Agrément Certificate laid in accordance with, and within, the limitations imposed by that Certificate.

11.12 Once installed, access to the roof should be restricted in accordance with section 3.5.

12 Procedure

General

12.1 The number of mechanical fixings required to fix the product will vary depending on the geographical location of the building, the topographical data, and height and width of the roof concerned etc.

12.2 The requirements for an additional number of fixings above those specified in section 12.4 should be assessed in accordance with BS 6399-2: 1997 or BS EN 1991-1-4 : 2005.

Timber/Metal and Concrete Decks

12.3 A 0.25 mm thick polythene vapour control layer should be laid, with 150 mm sealed laps. The vapour control layer should be turned up around the insulation and sealed to the waterproof finish at all edges and penetrations such as roof lights. Advice may be sought from the Certificate holder.

12.4 Boards are laid over the vapour control layer in a break-bonded pattern. On profiled metal decks, the long edges of the board should be laid at right angles to the ribs and all board ends must be fully supported on a rib. Boards are secured to the deck with a minimum of four or six mechanical fixings placed within the individual board area (1200 mm by 600 mm) and (2400 mm by 1200 mm) respectively, sited between 50 mm and 150 mm from all edges (see Figures 1 and 2). A minimum of four fixings per 1200 mm by 1200 mm tapered boards are recommended, sited 210 mm from all edges (see Figure 3). Countersunk washers with square or circular plates of at least 50 mm by 50 mm or 50 mm diameter should be used with each fixing.

Figure 1 Fixing layout 1200 mm by 600 mm board — minimum fixing numbers

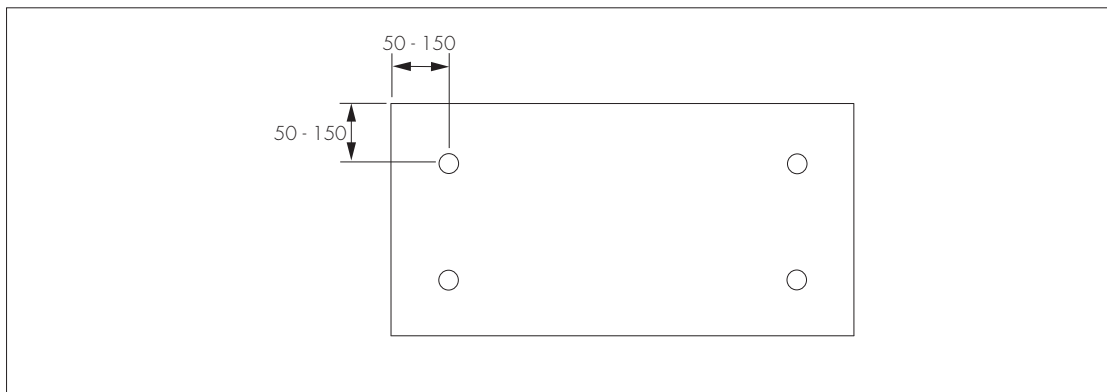
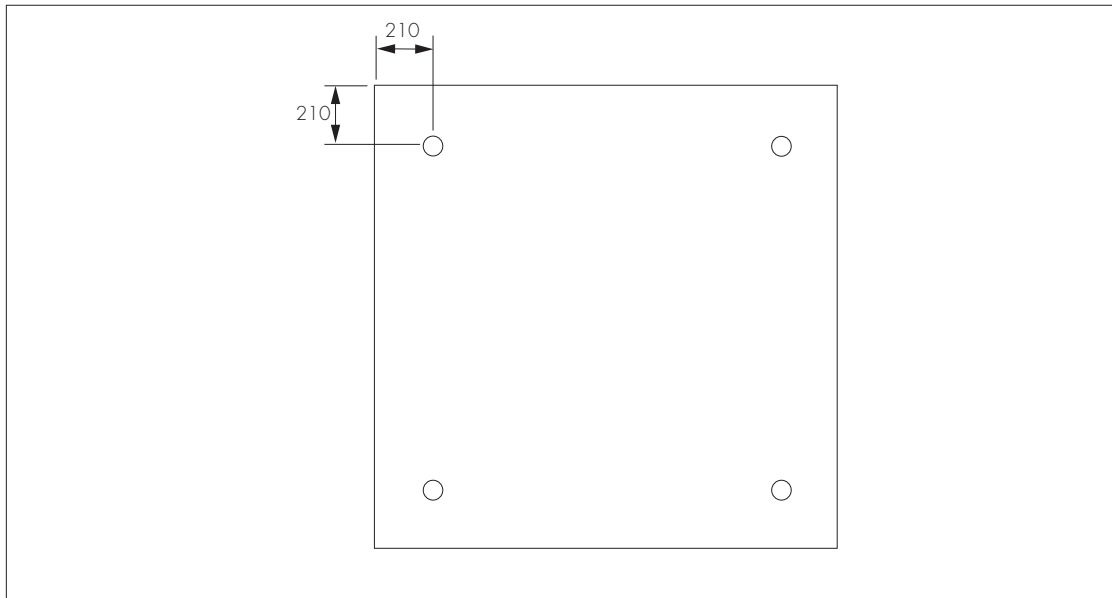


Figure 2 Fixing layout 2400 mm by 1200 mm board — minimum fixing numbers



Figure 3 Fixing layout 1200 mm by 1200 mm tapered board – minimum fixing numbers



12.5 A single-ply membrane is mechanically fixed to the deck through the board, with joints overlapped prior to sealing of the joint, in accordance with the manufacturer's instructions and the relevant Agrément Certificate.

Technical Investigations

13 Tests

Tests were carried out by the BBA on Xtratherm Thin-R Flat Roof Insulation Board (FR Alu) and the results assessed to determine:

- behaviour under variations in temperature (unrestrained)
- behaviour under distributed load and increased temperature
- effect of concentrated load on cantilevered parts
- bowing under the effect of a thermal gradient
- behaviour on exposure to moisture
- tensile strength perpendicular to faces
- compressive strength.

14 Investigations

14.1 An assessment was made of the results of test data relating to:

- density
- dimensional stability with temperature
- effect of concentrated load under a free span
- fire rating
- thermal conductivity (fresh and aged)
- dimensional variations in unrestrained panels.

14.2 An assessment of the risk of interstitial condensation was made.

14.3 An assessment was made of typical constructions which achieve the design U values.

Bibliography

- BS 476-3 : 2004 *Fire tests on building materials and structures — Classification and method of test for external fire exposure to roofs*
- BS 5250 : 2002 *Code of practice for control of condensation in buildings*
- BS 6229 : 2003 *Flat roofs with continuously supported coverings — Code of practice*
- BS 6399-2 : 1997 *Loading for buildings — Code of practice for wind loads*
- BS 8217 : 2005 *Reinforced bitumen membranes for roofing — Code of practice*
- BS EN 1991-1-4 : 2005 *Eurocode 1 : Actions on structures — General actions — Wind actions*
- BS EN ISO 6946 : 2007 *Building components and building elements — Thermal resistance and thermal transmittance — Calculation method*

15 Conditions

15.1 This Certificate:

- relates only to the product/system that is named and described on the front page
- is granted only to the company, firm or person named on the front page — no other company, firm or person may hold or claim any entitlement to this Certificate
- is valid only within the UK
- has to be read, considered and used as a whole document — it may be misleading and will be incomplete to be selective
- is copyright of the BBA
- is subject to English law.

15.2 Publications and documents referred to in this Certificate are those that the BBA deems to be relevant at the date of issue or re-issue of this Certificate and include any: Act of Parliament; Statutory Instrument; Directive; Regulation; British, European or International Standard; Code of Practice; manufacturers' instructions; or any other publication or document similar or related to the aforementioned.

15.3 This Certificate will remain valid for an unlimited period provided that the product/system and the manufacture and/or fabrication including all related and relevant processes thereof:

- are maintained at or above the levels which have been assessed and found to be satisfactory by the BBA
- continue to be checked as and when deemed appropriate by the BBA under arrangements that it will determine
- are reviewed by the BBA as and when it considers appropriate.

15.4 In granting this Certificate, the BBA is not responsible for:

- the presence or absence of any patent, intellectual property or similar rights subsisting in the product/system or any other product/system
- the right of the Certificate holder to manufacture, supply, install, maintain or market the product/system
- individual installations of the product/system, including the nature, design, methods and workmanship of or related to the installation
- the actual works in which the product/system is installed, used and maintained, including the nature, design, methods and workmanship of such works.

15.5 Any information relating to the manufacture, supply, installation, use and maintenance of this product/system which is contained or referred to in this Certificate is the minimum required to be met when the product/system is manufactured, supplied, installed, used and maintained. It does not purport in any way to restate the requirements of the Health & Safety at Work etc Act 1974, or of any other statutory, common law or other duty which may exist at the date of this Certificate; nor is conformity with such information to be taken as satisfying the requirements of the 1974 Act or of any statutory, common law or other duty of care. In granting this Certificate, the BBA does not accept responsibility to any person or body for any loss or damage, including personal injury, arising as a direct or indirect result of the manufacture, supply, installation, use and maintenance of this product/system.

