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Recticel Insulation Products
(a division of Recticel Ltd)

Mitchell Hey Mills
College Road
Rochdale
Lancashire OL12 6AE

Tel: 01706 715500 Fax: 01706 715511
e-mail: enquiries@recticelinsulation.co.uk
website: www.recticelinsulation.co.uk

CI/SfB

(47) Rn

**Agrément
Certificate
No 95/3113**
Fourth issue*



Designated by Government
to issue
European Technical
Approvals

EUROTHANE Bi-3, Bi-3A TAPERED AND SILVER ROOF INSULATION BOARDS

Isolant d'étanchéité support d'étanchéité
Wärmedämmung des Daches

Product




• THIS CERTIFICATE OF CONFIRMATION RELATES TO EUROTHANE Bi-3, Bi-3A TAPERED AND SILVER ROOF INSULATION BOARDS: FOIL/PAPER LAMINATE OR BITUMEN COATED GLASS TISSUE FACED RIGID POLYURETHANE FOAM INSULATION BOARDS.

• The product is for use as a thermal insulation layer on limited access flat roofs on suitably designed concrete, timber or metal structural decks in conjunction with suitable waterproofing systems.

• The product should always be used with a suitable vapour control layer.

Regulations

1 The Building Regulations 2000 (as amended) (England and Wales)

 The Secretary of State has agreed with the British Board of Agrément the aspects of performance to be used by the BBA in assessing the compliance of roof insulation with the Building Regulations. In the opinion of the BBA, Eurothane Bi-3, Bi-3A Tapered and Silver Roof Insulation Boards, if used in accordance with the provisions of this Certificate, will meet or contribute to meeting the relevant requirements.

Requirement: **B4(2)**

External fire spread

Comment:

When used in conjunction with appropriate roof decks and roof finishes, the product is not restricted under this Requirement. See sections 10.1 and 10.2 of this Certificate.

Requirement: **C2(c)**

Resistance to moisture

Comment:

When used in conjunction with an appropriate vapour control layer, the product will be unrestricted under this Requirement. See section 12.1 of this Certificate.

Requirement: **L1(a)(i)**

Conservation of fuel and power

Comment:

The product can contribute to enabling a roof to meet its Target Emission Rate. See sections 11.2 to 11.5 of this Certificate.

Requirement: **Regulation 7**

Materials and workmanship

Comment:

The product is acceptable. See section 14 of this Certificate.

continued

continued

- The product is available in a range of sizes and thicknesses.

Confirmation of a Belgian ATG 04/1575 issued by Union Belge pour l'Agrément technique dans la construction (UBAtc) to Recticel N.V., Tramstraat 6, B-8560 Wevelgem, Belgium.

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2 The Building (Scotland) Regulations 2004



In the opinion of the BBA, Eurothane Bi-3, Bi-3A Tapered and Silver Roof Insulation Boards, if used in accordance with the provisions of this Certificate, will satisfy or contribute to satisfying the various Regulations and related Mandatory Standards as listed below.

Regulation:	8	Fitness and durability of materials and workmanship
Regulation:	8(1)	Fitness and durability of materials and workmanship
Comment:		The product can contribute to a construction satisfying this Regulation. See section 14 and the <i>Installation</i> part of this Certificate.
Regulation:	9	Building standards — construction
Standard:	2.2	Separation
Standard:	2.4	Cavities
Standard:	2.8	Spread from neighbouring buildings
Comment:		When used in conjunction with appropriate roof decks and roof finishes the product is unrestricted under these Standards, with reference to clauses 2.2.10 ⁽¹⁾⁽²⁾ , 2.4.6 ⁽¹⁾⁽²⁾ and 2.8.1 ⁽¹⁾⁽²⁾ respectively. See sections 10.1 and 10.2 of this Certificate.
Standard:	3.15	Condensation
Comment:		The product will contribute to enabling a roof to satisfy this Standard, with reference to clauses 3.15.1 ⁽¹⁾⁽²⁾ to 3.15.4 ⁽¹⁾⁽²⁾ . See section 12.2 of this Certificate.
Standard:	6.2	Building insulation envelope
Comment:		The product can satisfy or contribute to satisfying this Standard, with reference to clauses 6.2.1 ⁽¹⁾⁽²⁾ and 6.2.4 ⁽¹⁾⁽²⁾ . See sections 11.6 and 11.7 of this Certificate.

(1) Technical Handbook (Domestic).
(2) Technical Handbook (Non-Domestic).

3 The Building Regulations (Northern Ireland) 2000



In the opinion of the BBA, Eurothane Bi-3, Bi-3A Tapered and Silver Roof Insulation Boards, if used in accordance with the provisions of this Certificate, will satisfy or contribute to satisfying the various Regulations as listed below.

Regulation:	B2	Fitness of materials and workmanship
Comment:		The product is acceptable. See section 14 of this Certificate.
Regulation:	E4	External fire spread
Comment:		When used in conjunction with appropriate roof decks and roof finishes, the product is not restricted under this Regulation. See sections 10.1 and 10.2 of this Certificate.
Regulation:	F2	Building fabric
Comment:		The product will satisfy or contribute to satisfying the requirements of the Elemental Method of limiting heat loss. See section 11.8 of this Certificate.

4 Construction (Design and Management) Regulations 1994 (as amended) Construction (Design and Management) Regulations (Northern Ireland) 1995 (as amended)

Information in this Certificate may assist the client, planning supervisor, designer and contractors to address their obligations under these Regulations.

See section: 5 Description (5.2) of this Certificate.

5 Description

5.1 Eurothane Bi-3, Bi-3A Tapered and Silver Roof Insulation Boards are manufactured in accordance with BS EN 13165 : 2001 from rigid polyurethane foam with facings on both sides of:

- bitumen-coated, glass tissue (Eurothane Bi-3 and Bi-3A Tapered), or
- aluminium foil/kraft paper laminate (Eurothane Silver).

5.2 The boards have a nominal density of 30 kgm^{-3} and are available in the range given in Table 1.

	Bi-3	Bi-3A Tapered	Silver
Length (mm)	1200	1200	1200, 2400
Width (mm)	600	600	600, 1200 2500
Thickness (mm)	30, 40, 50 60, 80, 100 120 ⁽¹⁾ , 160	20/40, 40/60 60/80, 80/100	30, 40, 50 60, 70, 160
Rebated edge available ⁽²⁾	yes	no	yes
Lap joint available	yes	no	yes
1/60 taper ⁽³⁾	no	yes	no

(1) Intermediate thickness available on request.

(2) Minimum thickness 40 mm.

(3) 1/80 tapered also available.

5.3 The boards have physical characteristics as given in Table 2.

	Bi-3	Bi-3 >60 mm	Bi-3A Tapered	Silver
Minimum compressive strength at 10% compression (kPa)	120	120	120	120
Thermal conductivity ($\text{Wm}^{-1}\text{K}^{-1}$)	0.028	0.027	0.028	0.023

6 Delivery and site handling

6.1 The roof insulation boards are delivered to site in packs wrapped in polyethylene. Each pack bears product name, number of boards, the manufacturer's name and the BBA identification mark incorporating the number of this Certificate.

6.2 Packs should be stored off the ground on a clean, level surface and under cover to protect against precipitation.

7 General

7.1 Eurothane Bi-3, Bi-3A Tapered and Silver Roof Insulation Boards are for use as a thermal insulation layer and roof waterproofing substrate on limited access flat roofs with concrete, timber or metal structural decks. Eurothane Silver is not suitable for use under hot-applied, built-up felt and mastic asphalt.

7.2 Decks should be designed in accordance with the relevant clauses of BS 8217 : 2005, BS 8218 : 1998, BS 6229 : 2003 and, where appropriate, NHBC Standards, Chapter 7.1 and *Zurich Building Guarantee Technical Manual*, Section 4 *Superstructure*, Sub-section *Flat roofs*.

7.3 The roofs should incorporate an effective vapour control layer.

7.4 The boards are for use with waterproofing specifications of:

- built-up bitumen felt to BS EN 13707 : 2004 in accordance with BS 8217 : 2005
- mastic asphalt laid in accordance with BS 8218 : 1998.
- other waterproofing systems which are the subject of a current Agrément Certificate laid in accordance with, and within the limitations imposed by, that Certificate.

7.5 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. Where traffic in excess of this is envisaged, special precautions, such as the use of additional protection to the waterproofing membrane, must be taken.

7.6 Flat roofs are defined for the purpose of this Certificate as those roofs having a minimum finished fall of 1:80. Pitched roofs are those having falls in excess of 1:6.

7.7 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 deflection, direction of falls.

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

8 Resistance to wind uplift

8.1 In mechanically fixed systems, the number of fixings and their position will depend on:

- wind uplift forces to be resisted
- the pull-out strength of fixing screws
- elastic limit of the single-ply membrane
- appropriate safety factors.

8.2 A minimum of four mechanical fixings should always be placed within the individual board area and sited adjacent to the corners of the board.

8.3 The number of fixings used should be established by reference to the wind uplift forces calculated in accordance with BS 6399-2 : 1997 on the basis of maximum permissible loads.


8.4 In bonded and mechanically fixed systems, adhesion between the boards and vapour control layer and between the boards and overlay is adequate to resist the effects of wind suction and thermal cycling likely to be experienced under normal conditions. In areas where high wind speeds can be expected, the number of mechanical fixings should be considered and the advice of the Certificate holder should be sought as to the method of fixing as defined in the relevant clauses of BS 6399-2 : 1997.

9 Resistance to loading

9.1 Boards have adequate resistance to the loads associated with the minimal pedestrian traffic envisaged in the maintenance of the roof; for areas where heavier pedestrian traffic is envisaged extra precautions should be taken.

9.2 Care must be taken to avoid damage to boards by impact or by concentrated loads when unprotected or when covered by a built-up bitumen felt specification.

10 Properties in relation to fire

 10.1 The fire rating of any roof containing the boards will depend heavily on the type and nature of the deck, on the waterproofing layer and/or the surface finish.

10.2 The designation of the roof covering containing the boards must meet or satisfy the requirements of the national Building Regulations, thus:

England and Wales

Approved Document B, Section 15, Notional designations of some common roof coverings are given in Appendix A, Table A5 of the Approved Document

Scotland

Mandatory Standards 2.2, 2.4 and 2.8, clauses 2.2.10⁽¹⁾⁽²⁾, 2.4.6⁽¹⁾⁽²⁾ and 2.8.1⁽¹⁾⁽²⁾ respectively.

(1) Technical Handbook (Domestic).


(2) Technical Handbook (Non Domestic).

Northern Ireland

Regulation E4, if on flat roofs, the waterproof covering is protected by one of the surface finishes defined in Part iv of Table 4.6 of Technical Booklet E, the roof is deemed to be of designation AA.

11 Thermal performance

11.1 Calculations of the thermal transmittance (U value) of specific roof constructions should be carried out in accordance with BS EN ISO 6946 : 1997 and BRE report (BR 443 : 2006) *Conventions for U-value calculations*, using a thermal conductivity as shown in Table 2. The U value of a roof containing this product will depend on the thickness of the board, and the use of the product.


 11.2 Subject to the selection of the appropriate board thickness, a flat roof can improve on the Elemental U value of $0.25 \text{ Wm}^{-2}\text{K}^{-1}$ required by the 2002 Regulations. The product, therefore, can contribute to enabling a building to meet the Target Emission Rate 'average' improvements of 20% (dwellings) and 23 to 28% (buildings other than dwellings) specified in Approved Documents L1A and L2A respectively.

11.3 The product can maintain, or contribute to maintaining, continuity of thermal insulation at junctions between the roof and other building elements. Guidance in this respect, and on limiting heat loss by air infiltration, can be found in *Limiting thermal bridging and air leakage : Robust construction details for dwellings and similar buildings* TSO 2002.

11.4 Compliance with the guidance referred to in section 11.3, including airtightness measures, will allow the use of the default psi values from Table 3 of BRE Information Paper IP 1/06 *Assessing the effects of thermal bridging at junctions and around openings* and Table K1 of SAP 2005 *The Government's Standard Assessment Procedure for Energy Rating of Dwellings*

11.5 When installed in flat roofs of existing buildings, the product can meet, or contribute to meet, the relevant requirements of the following guidance documents:


- Approved Document L1B, section 2
- Approved Document L2B, section 3.

 11.6 Subject to the selection of an appropriate board thickness, roofs can satisfy the Elemental Target U value of $0.25 \text{ Wm}^{-2}\text{K}^{-1}$ specified in Table 1 to clause 6.2.1⁽¹⁾⁽²⁾.

(1) Technical Handbook (Domestic).

(2) Technical Handbook (Non Domestic).

11.7 The product can maintain, or contribute to maintaining, continuity of thermal insulation at junctions between the roof and other building elements. Guidance in BRE report (BR 262 : 2002) *Thermal insulation: avoiding risks* is acceptable.

 11.8 Subject to the selection of an appropriate board thickness, a flat roof construction in Northern Ireland can satisfy the Elemental target U value of $0.35 \text{ Wm}^{-2}\text{K}^{-1}$ specified in Technical Booklet F, Tables 1.2 and 1.4.

12 Condensation

Surface condensation



12.1 Roofs will limit the risk of surface condensation adequately when the thermal transmittance (U value) does not exceed $0.35 \text{ Wm}^{-2}\text{K}^{-1}$ at any point, and the junctions with roofs and openings are designed in accordance with *Limiting thermal bridging and air leakage. Robust construction details for dwellings and similar buildings* TSO 2002 or the BRE Information Paper IP 1/06.



12.2 For buildings in Scotland, other constructions will also be acceptable where the thermal transmittance (U value) of the roof does exceed $1.2 \text{ Wm}^{-2}\text{K}^{-1}$ at any point and openings and junctions with other elements comply with the guidance given in Section 8 of BS 5250 : 2002, BRE report (BR 262 : 2002) or Technical Booklet, Annex 6D, of the Scottish Building Regulations.

Interstitial condensation

12.3 Roofs will limit the risk of interstitial condensation adequately when they are designed and constructed in accordance with BS 5250 : 2002 (Section 8 and Annex D).

13 Maintenance

Maintenance of the insulation layer will not be required provided the roof waterproof covering remains intact.

14 Durability



The boards are rot-resistant and durable. They will have a life at least as long as the roof waterproofing.

Installation

15 General

15.1 Installation of Eurothane Bi-3, Bi-3A Tapered and Silver Roof Insulation Boards must be in accordance with the manufacturer's instructions BS 8217 : 2005, BS 8218 : 1998, BS 6229 : 2003 or the relevant Agrément Certificate, depending on the waterproofing to be applied. Bitumen bonding may be augmented by mechanical fixing where appropriate (see section 8.3 of this Certificate).

15.2 When the vapour control layer is to be bitumen bonded to the substrate, the deck joints and the deck must be coated with bitumen primer.

15.3 A bitumen felt vapour control layer should always be installed in accordance with BS 8217 : 2005. Care should be taken to ensure continuity at joints, upstands and roof penetrations.

15.4 The boards cut and handle easily and provide surfaces suitable for effective bitumen

bonding (see section 16.3). In particular, surfaces must be dry and clean and the ambient temperature must be above freezing.

15.5 It is important to seal any exposed edges of the board, eg at roof vents, upstands, with waterproofing on hot bitumen in accordance with normal practice.

15.6 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.

15.7 Once installed, access to the roof should be restricted in accordance with section 9 of this Certificate.

15.8 If the tapered boards are to be effective in providing a uniform fall, it is essential that the structural deck is reasonably true and even. On tall buildings or in areas subject to high wind speeds, boards should be mechanically fixed in conjunction with large diameter washers at the rate specified by the Certificate holder.

16 Procedures

Timber deck (eg tongue-and-groove boards, plywood)

16.1 The vapour control layer is nailed to the deck, in accordance with BS 8217 : 2005.

16.2 Hot bitumen is mopped over the vapour control layer and the boards are bedded into it as work proceeds. Boards should be laid broken bond (ie staggered).

16.3 Only sufficient boards should be laid that can be waterproofed in the same working period. One of the following methods should be used:

- built-up felt specifications are laid partially bonded, in conjunction with a type 3G venting layer to BS EN 13707 : 2004, directly on to the boards, in accordance with BS 8217 : 2005
- with asphalt, a loose-laid type 4A or 4B isolating layer to BS EN 13707 : 2004 is first laid, followed by two layers of mastic asphalt in accordance with BS 8218 : 1998. A building paper separating membrane should be used under mastic asphalt (in addition to the type 4A/4B isolating layer) to prevent bonding to the board
- other waterproofing layers should be installed in accordance with the manufacturer's instructions and the relevant Agrément Certificate.

Concrete and screeded concrete decks

16.4 The vapour control layer and insulation boards are both fully bonded with hot bitumen and then waterproofed as described in section 16.3 of this Certificate.

Metal decks

16.5 The vapour control layer is bitumen bonded over the metal deck and the laps are sealed, boards are laid with the long axis at right angles to the corrugations and are bonded with hot bitumen. Boards may be used on decks having a clear span between corrugations of up to 100 mm for 30 mm boards, 150 mm for 40 mm boards and 200 mm for 50 mm boards and over. Board ends must be cut so that they are supported by the decking. The waterproofing is then applied as described in section 16.3 of this Certificate.

Technical Investigations

The following is a summary of the technical investigations carried out on Eurothane Bi-3, Bi-3A Tapered and Silver Roof Insulation Boards.

17 Tests

As part of the assessment carried out by BUtgb/UBAtc⁽¹⁾, resulting in the issue of ATG 04/1575, tests were carried out to determine:

- density
- thermal resistance (fresh and aged)
- dimensional stability
- tensile strength
- compressive strength at 10% compression
- water vapour resistivity
- water absorption.

(1) The Agrément body in Belgium — BUtgb is the abbreviation in Flemish and UBAtc in French.

18 Investigations

Manufacturing quality control records were examined and evaluated.

Bibliography

- 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 8218 : 1998 *Code of practice for mastic asphalt roofing*
- BS EN 13165: 2001 *Thermal insulation products for buildings — Factory made rigid polyurethane foam (PUR) products — Specification*
- BS EN 13707 : 2004 *Flexible sheets for waterproofing — Reinforced bitumen sheets for roof waterproofing — Definitions and characteristics*
- BS EN ISO 6946 : 1997 *Building components and building elements — Thermal resistance and thermal transmittance — Calculation method*

Conditions of Certification

19 Conditions

19.1 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.

19.2 References in this Certificate to any Act of Parliament, Regulation made thereunder, Directive or Regulation of the European Union, Statutory Instrument, Code of Practice, British Standard, manufacturers' instructions or similar publication, are references to such publication in the form in which it was current at the date of this Certificate.

19.3 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
- remain covered by a valid Belgian Agrément; and
- are reviewed by the BBA as and when it considers appropriate.

19.4 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 or 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.

19.5 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 or in the future; nor is conformity with such information to be taken as satisfying the requirements of the 1974 Act or of any present or future 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.



In the opinion of the British Board of Agrément, Eurothane Bi-3, Bi-3A Tapered and Silver Roof Insulation Boards are fit for their intended use provided they are installed, used and maintained as set out in this Certificate. Certificate No 95/3113 is accordingly awarded to Recticel Insulation Products.

On behalf of the British Board of Agrément

Date of Fourth issue: 4th September 2006

Chief Executive

**Original Certificate issued on 27th March 1995. This amended version includes product name changes and reference to revised Regulations and Standards, revised statements for Thermal performance and Condensation and new Conditions of Certification.*

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British Board of Agrément

P O Box No 195, Bucknalls Lane
Garston, Watford, Herts WD25 9BA
Fax: 01923 665301

©2006

e-mail: mail@bba.star.co.uk
website: www.bbacerts.co.uk



For technical or additional information,
contact the Certificate holder (see
front page).
For information about the Agrément
Certificate, including validity and
scope, tel: Hotline 01923 665400,
or check the BBA website.