



## Web Dynamics Ltd

Moss Lane  
Blackrod  
Lancashire BL6 5JB

Tel: 01204 695666 Fax: 01204 695333  
e-mail: thinsulex@webdynamics.co.uk  
website: www.webdynamics.co.uk

**Agrément  
Certificate  
No 06/4379**

Designated by Government  
to issue  
European Technical  
Approvals

## THINSULEX

Isolation thermique  
Wärmedämmung

## Product



• THIS CERTIFICATE RELATES TO THINSULEX<sup>(1)</sup>, AN INSULATION MATERIAL COMPRISING MULTILAYERS OF FIBROUS INSULATION SEPARATED BY MULTIPLE LAYERS OF SHEETS WITH REFLECTIVE SURFACES.

- The product is for use as an insulation above and/or below rafters in tiled or slated pitched roofs designed and constructed in accordance with the relevant clauses of BS 5534 : 2003.
- The product is for use in both new and existing dwellings.

(1) Thinsulex is a registered trademark of Web Dynamics Ltd.

## 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 thermal insulation systems with the Building Regulations. In the opinion of the BBA, Thinsulex, if used in accordance with the provisions of this Certificate, will meet or contribute to meeting the relevant requirements.

Requirement: **B4(2)**

Internal fire spread (structure)

Comment:

The product will not affect the external fire rating of a tiled or slated roof in which it is installed. See section 8.2 of this Certificate.

Requirement: **C2(c)**

Resistance to moisture

Comment:

The product can contribute to a roof meeting this Requirement. See sections 12.1 and 12.5 of this Certificate.

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

Conservation of fuel and power

Comment:

Roofs incorporating the product can contribute to a new building meeting its Target Emission Rate. See sections 10.4 to 10.7 of this Certificate.

Requirement: **Regulation 7**

Materials and workmanship

Comment:

The product is acceptable. See section 15 of this Certificate.

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## 2 The Building (Scotland) Regulations 2004



In the opinion of the BBA, Thinsulex, 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 15 and the <i>Installation</i> part of this Certificate.
Regulation:	9	<b>Building standards – construction</b>
Standard:	2.2	Separation
Comment:		The product must not penetrate the separating wall junction with the roof to ensure that the fire-resistant integrity of the separating wall is maintained in accordance with clause 2.2.10 <sup>(1)</sup> . See section 8.2 of this Certificate.
Standard:	3.15	Condensation
Comment:		The product can contribute to a roof satisfying the requirements of clauses 3.15.1 <sup>(1)</sup> , 3.15.2 <sup>(1)</sup> , 3.15.3 <sup>(1)</sup> , 3.15.4 <sup>(1)</sup> and 3.15.6 <sup>(1)</sup> of this Standard. See sections 12.1 and 12.6 of this Certificate.
Standard:	6.2	Building insulation envelope
Comment:		The product can contribute to a roof satisfying the requirements of this Standard, with reference to clauses 6.2.1 <sup>(1)</sup> and 6.2.5 <sup>(1)</sup> . See sections 10.8 and 10.9 of this Certificate.
Regulation:	12	<b>Building standards – conversions</b>
Comment:		All comments given for this product under Regulation 9, also apply to this Regulation with reference to clause 0.12.1 <sup>(1)</sup> and Schedule 6 <sup>(1)</sup> .

(1) Technical Handbook (Domestic).

## 3 The Building Regulations (Northern Ireland) 2000



In the opinion of the BBA, Thinsulex, if used in accordance with the provisions of this Certificate, will satisfy or contribute to satisfying the various Building Regulations as listed below.

Regulation:	B2	Fitness of materials and workmanship
Comment:		The product is acceptable. See section 15 of this Certificate.
Regulation:	C5	Condensation
Comment:		The product can contribute to a roof satisfying the requirements of this Regulation. See section 12.1 of this Certificate.
Regulation:	E5(b)	External fire spread
Comment:		The product will not affect the external fire rating of a tiled or slated roof in which it is installed. See section 8.2 of this Certificate.
Regulation:	F2	Building fabric
Comment:		Roofs incorporating the product will satisfy or contribute to satisfying the requirements of the Elemental Method of limiting heat loss. See section 10.10 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 (5.3).

## Technical Specification

### 5 Description

5.1 Thinsulex is an insulation material comprising outer layers of coated metallized film, laminated to a non-woven polypropylene fabric enclosing the core and welded along both long edges. The core of the product consists of five layers of polyester fibre wadding separated by four metallized film layers.

5.2 The product is available in roll form with a width of 1.2 m, 10 m length and 30 mm thickness.

5.3 Ancillary items used with the product are:

- Henkel 'Duck' brand 50 mm duct tape (silver)
- 14 mm staples or nails<sup>(1)</sup>
- vapour control layer<sup>(1)</sup>
- roof tile underlay<sup>(1)</sup>
- pre-treated counter battens, softwood battens and tiling laths<sup>(1)</sup>
- roofing slates or tiles<sup>(1)</sup>
- additional insulation where required<sup>(1)</sup>.

(1) Outside the scope of this Certificate.

### 6 Delivery and site handling

6.1 The product is delivered to site in rolls packed in a protective, branded bag sealed with an end label. Fitting instructions are placed in the bag.

6.2 The rolls should be stored in clean, dry conditions not exposed to sunlight. The product must be protected from being dropped or crushed by objects. Care must be exercised when storing large quantities on site. The product must not be exposed to open flame or other ignition sources and must be stored away from flammable material such as paint and solvents.

6.3 On site, to ensure maximum performance of the product when installed, precautions must be taken to protect it from mud and dirt.

## Design Data

### 7 General

7.1 Thinsulex is a flexible insulation used in conjunction with other insulation materials to reduce the U value (thermal transmittance) in new or existing pitched roofs. When installed under the rafters, the product performs as a vapour control layer in the roof system (see section 12.4).

7.2 The product is for use in constructions where the ceiling follows the pitch of the roof and encloses a habitable space.

7.3 Care must be taken to ensure that the product is covered after installation, as it must not be exposed to rain, showers or wind-driven rain.

7.4 Where constructions need to comply with NHBC Standards, Part 7 *Roofs*, or *Zurich Building Guarantee Technical Manual*, Section 4 *Superstructure*, Sub-section *Pitched roofs*, specifiers should observe the requirements of these documents.

7.5 Care must be taken to ensure the product does not come into contact with heat sources greater than 80°C.

### 8 Behaviour in relation to fire

8.1 When installed with an internal lining board, eg 12.5 mm thick plasterboard, the insulation will be contained between the roof and internal lining board, until one is destroyed. Therefore, the insulation will not contribute to the development stages of a fire or present a smoke or toxic hazard.

8.2 The insulation must not be carried over junctions between roofs and walls required to provide a minimum period of fire resistance. The continuity of fire resistance must be maintained, for example as described in:

#### *England and Wales*

Approved Document B, paragraphs 9.28 to 9.31

#### *Scotland*

Mandatory Standard 2.2, clause 2.2.10<sup>(1)</sup>

(1) Technical Handbook (Domestic).

#### *Northern Ireland*

Technical Booklet E, paragraph 3.21.

8.3 The use of the product will not affect the fire rating obtained by tiled or slated roofs when evaluated by assessment or test to BS 476-3 : 1958.

8.4 When installed with other additional insulation materials, the fire properties of these materials must be taken into consideration.

### 9 Proximity of flues and appliances

When the product is installed in close proximity to certain flue pipes and/or heat-producing appliances, for buildings subject to national Building Regulations the relevant provisions and guidance given below should be met:

#### *England and Wales*

Approved Document J

#### *Scotland*

Mandatory Standard 3.19

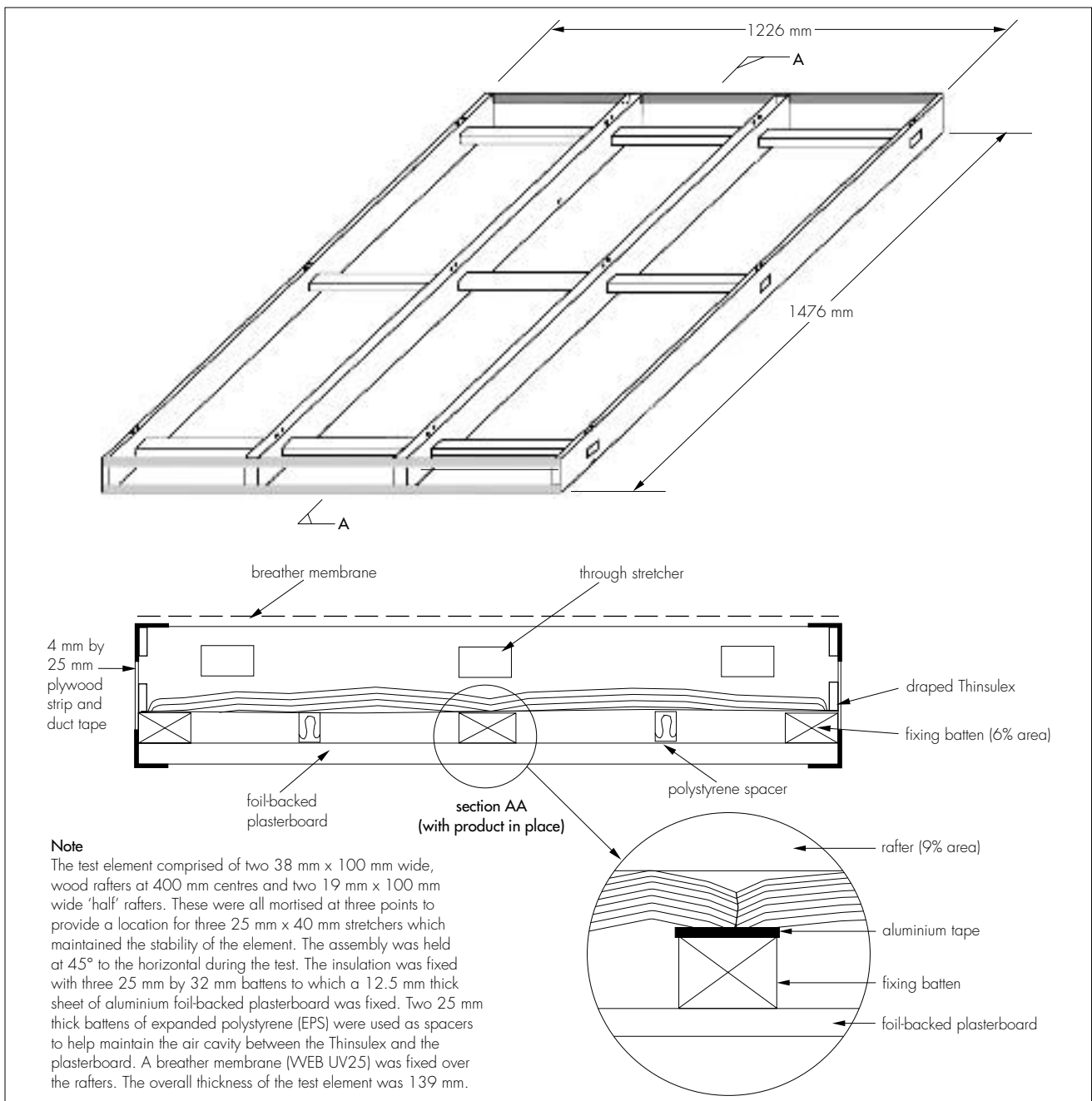
#### *Northern Ireland*

Technical Booklet L.

### 10 Thermal performance

10.1 Thermal transmittance (U values) were measured according to BS EN ISO 8990 : 1996 with 30 mm thickness of Thinsulex installed in a representative roof section (see Figure 1).

Figure 1 Test construction



10.2 In one of the tests the insulation was installed under the rafters and the measured U value was  $0.53 \text{ Wm}^{-2}\text{K}^{-1}$  and when installed under and above the rafters the value measured was  $0.29 \text{ Wm}^{-2}\text{K}^{-1}$ .

10.3 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 the following values:

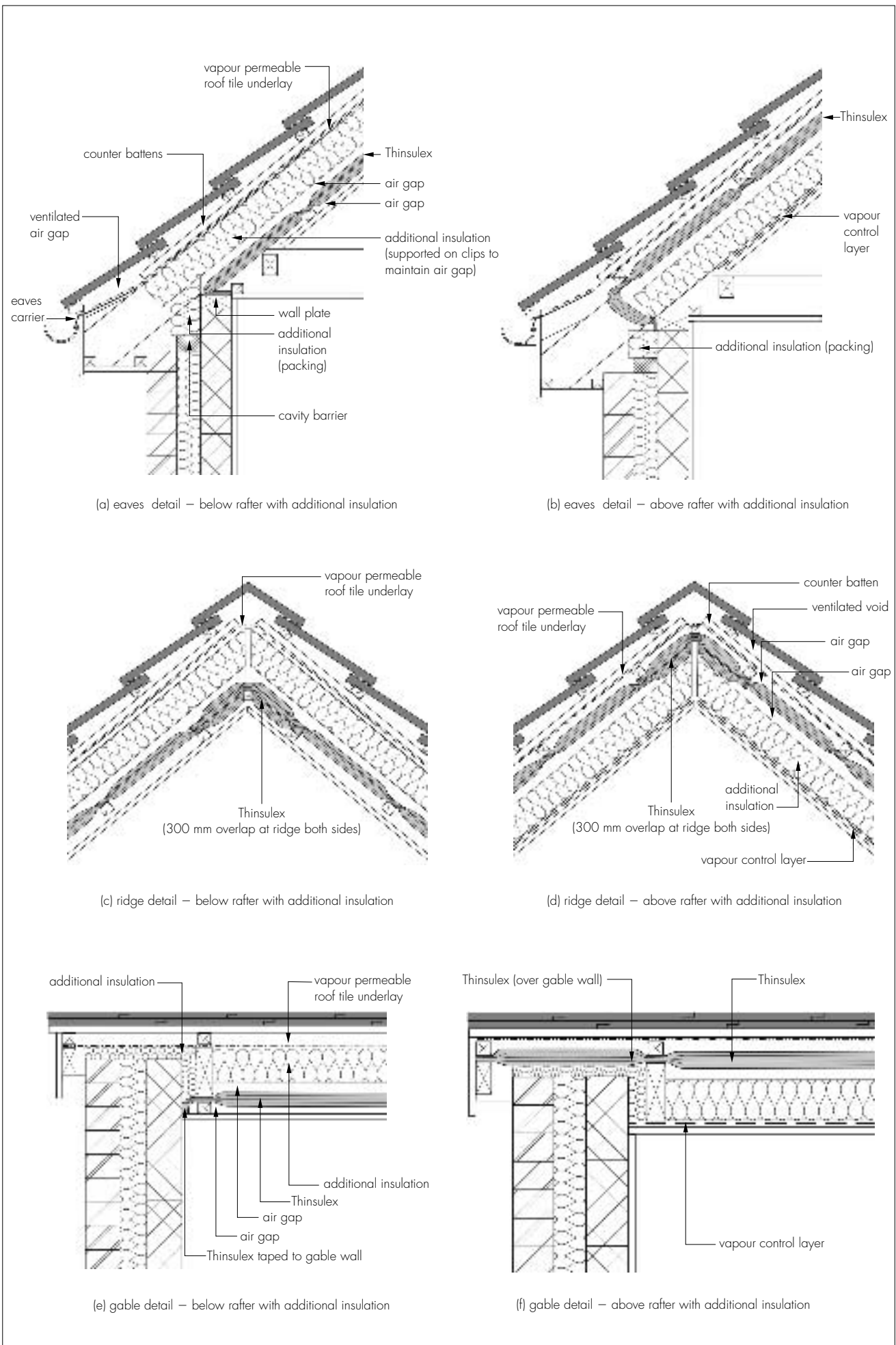
- thermal resistance of insulation (thickness 30 mm)  $0.92 \text{ m}^2\text{KW}^{-1}$
- emissivity of outer layers — 0.4
- thermal resistance of the insulation including air layers and bridging (see Figure 1) —  $1.69 \text{ m}^2\text{KW}^{-1}$ .



10.4 Subject to the combination of the product with other insulation materials, a roof construction can improve on the Elemental U value of  $0.25 \text{ Wm}^{-2}\text{K}^{-1}$  required by the Building Regulations. The product therefore can contribute to enabling a building to meet the Target Emission Rate 'average' improvement of 20% (dwellings) specified in Approved Document L1A.

10.5 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 the *Limiting thermal bridging and air leakage : Robust construction details for dwellings and similar buildings* TSO : 2002 (see Figure 2).

Figure 2 Construction details



10.6 Compliance with the guidance referred to in section 10.5, 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 *The Government's Standard Assessment Procedure for Energy Rate of Dwellings, SAP 2005*, in Target Emission Rate calculations to SAP 2005 or the Simplified Building Energy Model (SBEM)<sup>(1)</sup>.

(1) Published by the Department for Communities and Local Government on its website: [www.communities.gov.uk](http://www.communities.gov.uk)

10.7 When installed in roofs of existing buildings, the product can meet, or contribute to meet, the relevant requirements of the guidance document:

- Approved Document L1B, section 2 — for insulation at rafter level is  $0.20 \text{ Wm}^{-2}\text{K}^{-1}$  for new thermal element in an extension and replacement thermal element in an existing dwelling.



10.8 Subject to the combination of the product with other insulation materials, roofs can satisfy the Elemental target U value of  $0.25 \text{ Wm}^{-2}\text{K}^{-1}$  specified in Table 1 of clause 6.2.1 of the Technical Handbook (Domestic).

10.9 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.



10.10 Subject to the combination of the product with other insulation materials or with Thinsulex above and below the rafters, a roof construction in Northern Ireland can satisfy the Elemental target U value of  $0.35 \text{ Wm}^{-2}\text{K}^{-1}$  specified in Table 1.2 of Technical Booklet F.

10.11 Junctions and opening details (see Figure 2) maintain insulation continuity according to the Accredited Construction Details Version 1.0 (see also section 10.5).

## 11 Air leakage

11.1 The insulation was tested to BS EN 12114 : 2000 with positive pressure of 50 Pa and 100 Pa. The leakage rate was  $0.19 \text{ m}^3\text{h}^{-1}\text{m}^{-2}$  and practically zero respectively.

11.2 When the product is used as a vapour control layer and an air barrier, the airtightness of the system is reliant on the careful sealing of the insulation and is dependent on maintaining the integrity of seal throughout. In addition to sealing at all joints, the insulation must be suitably sealed at the perimeter and all penetrations. Details of sealing at eaves, ridges, hips, valleys and penetrations must be in accordance with the Certificate holder's instructions.

11.3 The airtightness of the building will also be dependent on the performance of the other building

elements. Provided these also incorporate appropriate design details and building techniques, air infiltration through the building fabric should be minimal and the building reasonably airtight.

## 12 Condensation

### Interstitial condensation



12.1 Roofs incorporating the product will adequately limit the risk of interstitial condensation when designed and constructed in accordance with BS 5250 :2002, Section 8.4 and Appendix D.

12.2 The risk of interstitial condensation is greatest when the building is drying out after construction. Guidance on preventing condensation from this and other sources is given in BRE Digest 369 *Interstitial condensation and fabric degradation* and BRE report (BR 262 : 2002).

12.3 The product has a high water vapour resistance with a measured value in excess of  $1200 \text{ MNsg}^{-1}$ .

12.4 When installed in accordance with section 17 and in a continuous layer, the product will provide a convection-free envelope of high vapour resistance. For installation over the rafters, a vapour control layer can be used in conjunction with a suitable vapour permeable roof tile underlay without a ventilated air space. For installation under the rafters, the product can perform as a vapour control layer in conjunction with a vapour permeable roof tile underlay. Where high vapour resistance roof tile underlays are used, ventilation to the air space should be in accordance with the recommendations of BS 5250 : 2002 or relevant BBA certificate for the roof tile underlay. When installed in conjunction with other insulation materials, the water vapour resistance and installation instructions of the additional insulation should be taken into consideration.

### Surface condensation



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



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

## 13 De-rating of electrical cables

As with other insulation products, it may be necessary in some cases to de-rate electrical cables buried in insulation. In the *IEE Wiring Regulations – Regulations for Electrical Installation Sixteenth Edition 2001* it is suggested that where wiring is completely surrounded by insulation, it may need to be de-rated to as low as half its free air current carrying capacity. Guidance should be sought from a qualified electrician.

## 14 Maintenance and repair

Once installed, the product does not require any maintenance. Small holes, rips or punctures in the outer layers should be repaired with either Henkel 'Duck' brand duct tape (silver) or with an aluminium foil tape.

## 15 Durability



The product is rot-proof, does not tear easily and when installed as specified, will have a life equivalent to that of the roof structure in which it is incorporated.

## Installation

### 16 General

16.1 Installation of Thinsulex and additional insulation products should be in accordance with the Certificate holder's instructions and current good building practice.

16.2 During construction, care must be taken to ensure the product is not damaged during installation. Should damage occur by tearing, the product should be repaired by covering the holes with tape (see also section 17.14) or replaced.

16.3 The product is attached to the rafters by using staples or nails of at least 14 mm length. Double-sided tape and glue can also be used.

16.4 The product must have overlap joints of at least 50 mm and be taped along the entire length of the joint with Henkel 'Duck' brand duct tape (silver).

16.5 When the product is cut to fit around openings, eg the roof perimeter, care should be taken to minimise gaps.

16.6 The product can be cut easily by using sharp scissors or a knife.

16.7 Any exposed cut edges of the product should be sealed with a suitable adhesive tape.

### 17 Procedure

#### Above rafters installation

17.1 Installation starts from eaves and the insulation is unrolled parallel to the eaves.

17.2 As the product is unrolled across the rafters it is fixed using nails or staples of at least 14 mm length.

17.3 The next roll must overlap the preceding layer by at least 50 mm, and the overlap should be sealed along the entire length using Henkel 'Duck' brand duct tape (silver).

17.4 The product should be permanently fixed in place using wooden battens parallel to the rafters, held in place with nails.

17.5 When the top layer has been battened, any excess material may be cut by running a sharp knife along the edge of the batten.

17.6 A breathable roofing membrane (ie roof tile underlay) should be installed on the counter battens and tiling battens attached perpendicular to the rafters.

17.7 Roof tiles or slates are installed in accordance with BS 5534 : 2003.

17.8 When applying roof tiles or slates to a warm roof construction the recommendations of the tile/slate manufacturer should be followed.

#### Below rafters installation

17.9 Installation starts from the ridge with the product being unrolled parallel to the eaves.

17.10 As the product is unrolled across the rafters, it is fixed in place using glue, double-sided tape, nails or staples of at least 14 mm depth.

17.11 The next roll must overlap the preceding layer by at least 50 mm, and the overlap should be sealed along the entire length using Henkel 'Duck' brand duct tape (silver).

17.12 The product should be permanently held in place using wooden battens fixed with nails. Battens may run either parallel or perpendicular to the rafters.

17.13 When the bottom layer has been battened, any excess material may be cut by running a sharp knife along the edge of the batten.

17.14 Any exposed cut edges of the product should be sealed with a suitable adhesive tape. Any tears or holes in the outer layer should be repaired with heat-reflective tape.

17.15 A foil-backed plasterboard is fixed to the battens. The batten size should be at least 32 mm by 25 mm, with the fixings at either 150 mm spacing for nails or 230 mm for screws. This batten size should be sufficient to ensure a 20 mm air gap between the product and the plasterboard.

#### Additional insulation

17.16 When used with other additional insulation materials, care should be taken to ensure that all gaps are maintained in accordance with the

manufacturer's instructions for their products, and advice should be sought from the Certificate holder.

17.17 When the product is installed below the rafters, mineral wool products can be placed directly on top of the product between the rafters without an air space. When the product is installed above the rafters, mineral wool can rest on the vapour control layer and plasterboard without an air space.

17.18 Rigid polyurethane (PUR) products can be placed with a 20 mm gap above and below the insulation between rafters. Suitable fixings such as wooden battens nailed to the sides of the rafters or clips should be used in accordance with the manufacturer's instructions.

## Technical Investigations

The following is a summary of the technical investigations carried out on Thinsulex.

### 18 Tests

Tests were carried out to determine the emissivity, water vapour permeability and air infiltration properties of the product.

### 19 Investigations

19.1 An examination was made of data relating to:

- emissivity
- water vapour permeability
- durability
- behaviour in fire
- thermal transmission testing to BS EN ISO 8990 : 1996
- thermal resistance to EN 12667 : 2001.

19.2 An assessment of the risk of interstitial condensation in typical constructions was made.

19.3 A site survey was carried out to assess the practicability of installation and performance in use of the products.

## Bibliography

BS 476-3 : 1958 *Fire tests on building materials and structures — External fire exposure roof test*

BS 5250 : 2002 *Code of practice for control of condensation in buildings*

BS 5534 : 2003 *Code of practice for slating and tiling (including shingles)*

BS 7671 : 2001 *Requirements for electrical installations. IEE Wiring Regulations. Sixteenth Edition*

BS EN 12114 : 2000 *Thermal performance of buildings — Air permeability of building components and building elements — Laboratory test method*

BS EN ISO 6946 : 1997 *Building components and building elements — Thermal resistance and thermal transmittance — Calculation method*

BS EN ISO : 8990 : 1996 *Thermal insulation — Determination of steady-state thermal transmission properties — Calibrated and guarded hot box*

EN 12667 : 2001 *Thermal performance of building materials and products — Determination of thermal resistance by means of guarded hot plate and heat flow meter methods — Products of high and medium thermal resistance*

## Conditions of Certification

### 20 Conditions

20.1 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.

20.2 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.

20.3 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.

20.4 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.

20.5 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, Thinsulex is fit for its intended use provided it is installed, used and maintained as set out in this Certificate. Certificate No 06/4379 is accordingly awarded to Web Dynamics Ltd.

On behalf of the British Board of Agrément

Date of issue: 27th October 2006

Chief Executive



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**British Board of Agrément**

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

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e-mail: [mail@bba.star.co.uk](mailto:mail@bba.star.co.uk)  
website: [www.bbacerts.co.uk](http://www.bbacerts.co.uk)



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or check the BBA website.