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Agrément Certificate
06/4379
Product Sheet 1

MULTIFOIL INSULATION

TLX SILVER AND TLX SILVER FB FOR PITCHED ROOFS

This Agrément Certificate Product Sheet⁽¹⁾ relates to TLX Silver and TLX Silver FB for Pitched Roofs, reflective insulation materials for use below rafters in slated or tiled roofs designed in accordance with BS 5534 : 2014 in new and existing domestic buildings. The products can also be used in dormer cheeks and dwarf wall applications in pitched roofs.

(1) Hereinafter referred to as 'Certificate'.

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 products have an emissivity of 0.05 for the outer foil and thermal resistances of 0.91 m²·K·W⁻¹ for TLX Silver and 1.43 m²·K·W⁻¹ for TLX Silver FB (see section 6).

Condensation risk — the products can provide effective control to the passage of water vapour (see section 7).

Durability — under normal conditions, the products will have a life equivalent to that of the roof structure in which they are incorporated (see section 12).



The BBA has awarded this Certificate to the company named above for the products described herein. These products have been assessed by the BBA as being fit for their intended use provided they are installed, used and maintained as set out in this Certificate.

On behalf of the British Board of Agrément

John Albon — Head of Approvals

Construction Products

Claire Curtis-Thomas

Chief Executive

Date of Fourth issue: 26 March 2015

Originally certificated on 27 October 2006

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, TLX Silver and TLX Silver FB for Pitched Roofs, if installed, used and maintained in accordance with this Certificate, can contribute to satisfying the relevant requirements of the following Building Regulations (the presence of a UK map indicates that the subject is related to the Building Regulations in the region or regions of the UK depicted):



The Building Regulations 2010 (England and Wales) (as amended)

Requirement:	C2(c)	Condensation
Comment:		The products can contribute to satisfying this Requirement. See sections 7.1 and 7.5 of this Certificate.
Requirement:	L1(a)(i)	Conservation of fuel and power
Comment:		The products can contribute to satisfying this Requirement. See section 6 of this Certificate.
Requirement:	7	Materials and workmanship
Comment:		The products are acceptable. See section 12 and the <i>Installation</i> part of this Certificate.
Regulation:	26	CO ₂ emission rates for new buildings
Regulation:	26A	Fabric energy efficiency rates for new dwellings (applicable to England only)
Regulation:	26A	Primary energy consumption rates for new buildings (applicable to Wales only)
Regulation:	26B	Fabric energy efficiency rates for new dwellings (applicable to Wales only)
Comment:		The products can contribute to satisfying these Regulations; however compensating fabric/services measures may be required. See section 6.2 of this Certificate.



The Building (Scotland) Regulations 2004 (as amended)

Regulation:	8(1)	Durability, workmanship and fitness of materials
Comment:		The products can contribute to satisfying this Regulation. See section 12 and the <i>Installation</i> part of this Certificate.
Regulation:	9	Building Standards applicable to construction
Standard:	3.15	Condensation
Comment:		The products can contribute to satisfying this Standard, with reference to clauses 3.15.1 ⁽¹⁾ , 3.15.3 ⁽¹⁾ to 3.15.5 ⁽¹⁾ and 3.15.7 ⁽¹⁾ . See sections 7.1 and 7.6 of this Certificate.
Standard:	6.1(a)(b)	Carbon dioxide emissions
Standard:	6.2	Building insulation envelope
Comment:		The products can contribute to satisfying clauses, or parts of 6.1.1 ⁽¹⁾ to 6.1.3 ⁽¹⁾ , 6.1.6 ⁽¹⁾ , 6.2.1 ⁽¹⁾ , 6.2.3 ⁽¹⁾ to 6.2.7 ⁽¹⁾ , 6.2.9 ⁽¹⁾ to 6.2.11 ⁽¹⁾ and 6.2.13 ⁽¹⁾ of these Standards. See section 6 of this Certificate.
Standard:	7.1(a)	Statement of sustainability
Comment:		The products can contribute to satisfying the relevant requirements of Regulation 9, Standards 1 to 6, and, therefore, will contribute to a construction meeting a bronze level of sustainability as defined in this Standard. In addition, the products can contribute to a construction meeting a higher level of sustainability as defined in this Standard, with reference to clauses 7.1.4 ⁽¹⁾ [Aspects 1 ⁽¹⁾ and 2 ⁽¹⁾], 7.1.6 ⁽¹⁾ [Aspects 1 ⁽¹⁾ and 2 ⁽¹⁾] and 7.1.7 ⁽¹⁾ [Aspect 1 ⁽¹⁾]. See section 7.1 of this Certificate.
Regulation:	12	Building standards applicable to conversions
Comment:		All comments given for these products under Regulation 9, Standards 1 to 6, also apply to this Regulation, with reference to clause 0.12.1 ⁽¹⁾ and Schedule 6 ⁽¹⁾ . (1) Technical Handbook (Domestic). (2) Technical Handbook (Non-Domestic).



The Building Regulations (Northern Ireland) 2012

Regulation:	23	Fitness of materials and workmanship
Comment:		The products are acceptable. See section 12 and the <i>Installation</i> part of this Certificate.
Regulation:	29	Condensation
Comment:		The products can contribute to satisfying this Regulation. See section 7.1 of this Certificate.
Regulation:	39(a)(i)	Conservation measures
Regulation:	40(2)	Target carbon dioxide emission rate
Comment:		The products can contribute to satisfying these Regulations. See section 6 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 sections: 3 *Delivery and site handling* (3.2 and 3.4) and 8 *Behaviour in relation to fire* (8.7) of this Certificate.

Additional Information

NHBC Standards 2014

NHBC accepts the use of TLX Silver and TLX Silver FB for Pitched Roofs, when installed and used in accordance with this Certificate, in relation to *NHBC Standards, Chapter 7.2 Pitched roofs*.

CE marking

The Certificate holder has taken the responsibility of CE marking the product in accordance with harmonised European Standard BS EN 13984 : 2013 for its vapour control layer property. An asterisk (*) appearing in this Certificate indicates that data shown are given in the manufacturer's Declaration of Performance.

Technical Specification

1 Description

1.1 TLX Silver and TLX Silver FB for Pitched Roofs are insulation materials comprising outer layers of coated metallised film, laminated to a nonwoven polypropylene fabric enclosing the core and welded along both long edges. The core of the products consists of five layers of polyester fibre wadding separated by four metallised film layers. A tape with acrylic adhesive, and a minimum width of 50 mm, may be used if required.

1.2 The products are available in rolls with the dimensions shown in Table 1.

Product	Width (m)	Length (m)	Thickness (mm)
TLX Silver	0.4, 0.6, 1.2, 1.5, 2.4, 2.7, 3.0	10	30
TLX Silver FB	0.4, 0.6, 1.2, 1.5, 2.4, 2.7, 3.0	8	50

1.3 Ancillary items used with the products which are outside the scope of this Certificate include:

- 14 mm staples or nails
- vapour control layer (VCL)
- roof tile underlay
- pre-treated counter battens, softwood battens and tiling laths
- glue
- roofing slates or tiles
- additional insulation
- acrylic adhesive tape, minimum width 50 mm.

2 Manufacture

2.1 The outer layers of the products consist of non-woven polypropylene fabric adhesively laminated to a low emissivity film, coated to protect the reflective surface. The outer reflective laminate is purchased from approved suppliers and is supplied in roll form.

2.2 As part of the assessment and ongoing surveillance of product quality, the BBA has:

- agreed with the manufacturer the quality control procedures and product testing to be undertaken
- assessed and agreed the quality control operated over batches of incoming materials
- monitored the production process and verified that it is in accordance with the documented process
- evaluated the process for management of nonconformities
- checked that equipment has been properly tested and calibrated
- undertaken to carry out the above measures on a regular basis through a surveillance process, to verify that the specifications and quality control operated by the manufacturer are being maintained.

3 Delivery and site handling

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

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

3.3 On site, to ensure maximum performance of the products when installed, precautions must be taken to protect them from mud and dirt.

3.4 When installing in bright sunlight, dark glasses should be worn.

Assessment and Technical Investigations

The following is a summary of the assessment and technical investigations carried out on TLX Silver and TLX Silver FB for Pitched Roofs.

Design Considerations

4 General

4.1 TLX Silver and TLX Silver FB for Pitched Roofs are suitable for use as flexible insulations used in conjunction with other insulation materials to reduce the thermal transmittance (U value) in new or existing domestic pitched roofs. When installed under the rafters, the products can perform as a VCL in the roof system (see section 7.3).

4.2 The products are for use in constructions where the ceiling follows the pitch of the roof and encloses a habitable space. The products can also be used in dormer cheeks and dwarf walls.

4.3 Care must be taken to ensure that the products are covered after installation, as they must not be exposed to rain.

4.4 Care must be taken to ensure the products do not come into contact with heat sources greater than 80°C.

4.5 Roof tiles or slates are installed on pitched roofs in accordance with BS 5534 : 2014.

5 Practicability of installation

The products are designed to be installed by a competent general builder, or a contractor, experienced with these types of products.

6 Thermal performance

6.1 Calculations of thermal transmittance (U value) should be carried out in accordance with BS EN ISO 6946 : 2007 and BRE Report BR 443 : 2006 using the following values:

- 0.05 outer surface emissivity for TLX Silver and TLX Silver FB
- $0.91 \text{ m}^2 \cdot \text{K} \cdot \text{W}^{-1}$ R value for TLX Silver (30 mm thick)
- $1.43 \text{ m}^2 \cdot \text{K} \cdot \text{W}^{-1}$ R value for TLX Silver FB (50 mm thick)
- $0.06 \text{ m}^2 \cdot \text{K} \cdot \text{W}^{-1}$ R value of products when compressed between battens and rafters, to a nominal 2 mm thickness
- $0.45^{(1)(2)} \text{ m}^2 \cdot \text{K} \cdot \text{W}^{-1}$ R value of an air cavity adjacent to the product $\geq 13 \text{ mm}$ thick (upward heat flow)
- $0.66^{(1)(2)} \text{ m}^2 \cdot \text{K} \cdot \text{W}^{-1}$ R value of an air cavity adjacent to the product $\geq 20 \text{ mm}$ thick (horizontal heat flow).

(1) Unventilated cavity with a width and length at least 10 times the thickness and one high emissivity surface.

(2) For guidance on U value calculations refer to the BBA Information Bulletin No 3 (see BBA website).

6.2 The U value of a completed element will depend largely on the thickness and conductivity of the additional insulation used and the extent and arrangement of timber bridging. Example roof constructions are shown in Figure 1 and resulting U values in Table 2.

Figure 1 Example roof constructions

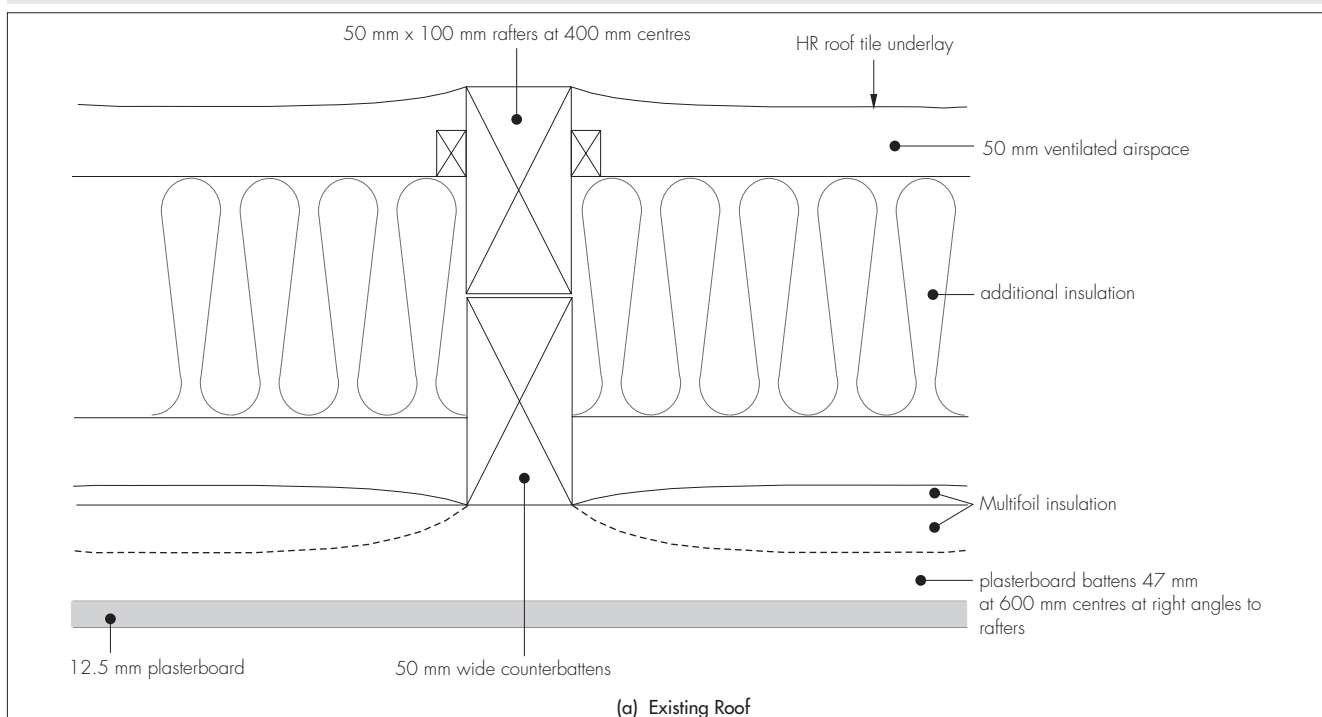


Figure 1 Example roof constructions (continued)

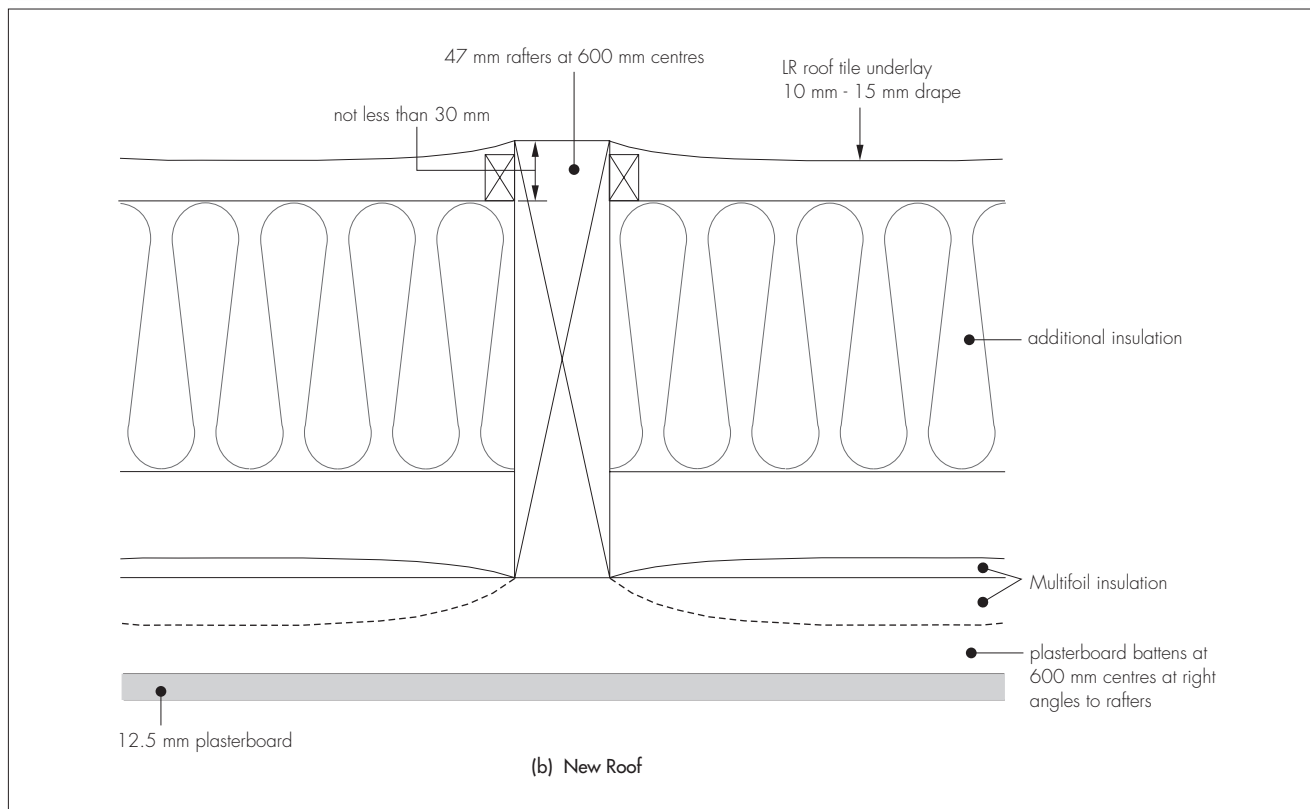


Table 2 U values for pitched roof constructions

Construction	Multi-foil	Total rafter depth (mm)	Batten depth (mm)	Additional insulation thickness ⁽¹⁾ (mm)	U value (W·m ⁻² ·K ⁻¹) ⁽²⁾
Existing roof ⁽³⁾	TLX Silver	200 ⁽⁵⁾	38	115	0.18
	TLX Silver FB		47	100	
Existing roof ⁽⁴⁾	TLX Silver	200 ⁽⁵⁾	38	125	0.18
	TLX Silver FB		47	110	
New roof ⁽³⁾	TLX Silver	200 ⁽⁶⁾	38	140	0.14
	TLX Silver FB		47	125	
New roof ⁽⁴⁾	TLX Silver	200 ⁽⁶⁾	38	145	0.14
	TLX Silver FB		47	130	

(1) PUR insulation (conductivity 0.022 W·m⁻¹·K⁻¹ and emissivity 0.2, thickness rounded to the nearest 5 mm).

(2) Assumes $\Delta U_g = 0$, ie no gaps exceeding 5 mm width penetrating the insulation layer.

(3) Battens perpendicular to rafters.

(4) Battens parallel to rafters.

(5) Rafters 50 mm wide at 400 mm centres.

(6) Rafters 47 mm wide at 600 mm centres.



6.3 Care must be taken in the overall design and construction of junctions with other elements and openings to minimise thermal bridges and air infiltration. Detailed guidance can be found in the documents supporting the national Building Regulations.

7 Condensation risk

Interstitial condensation



7.1 Roofs incorporating the products will adequately limit the risk of interstitial condensation when designed and constructed in accordance with BS 5250 : 2011, Annexes D and H.

7.2 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 : 1992 and BRE Report BR 262 : 2002.

7.3 The products have a water vapour resistance (μ) factor* in excess of 300 000 and can act as a VCL. In all cases, where high vapour resistance roof tile underlays are used, ventilation to the air space should be in accordance with the recommendations of BS 5250 : 2011 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 also be taken into consideration.

7.4 When using this type of product, due consideration must be taken of the overall installation to minimise perforations by services, eg light switches and power outlets and the joints at ceiling and skirting level must be well sealed.

Surface condensation



7.5 Roofs incorporating the products 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 walls are designed in accordance with guidance referred to in section 6.3 of this Certificate.



7.6 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 : 2011, Annex H, and BRE Report BR 262 : 2002.

8 Behaviour in relation to fire

8.1 TLX Silver and TLX Silver FB have reaction to fire classifications of Class D* and Class F* respectively in accordance with BS EN 13501-1 : 2007.

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, Volume 1, sections 5.11 and 5.12

Scotland — Mandatory Standard 2.2, clause 2.2.10⁽¹⁾

(1) Technical Handbook (Domestic).

Northern Ireland — Technical Booklet E, paragraph 4.21.

8.3 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 stage of a fire or present a smoke or toxic hazard.

8.4 The use of the products will not affect the fire rating obtained by tile or slated roofs.

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

8.6 The products will melt and shrink away from heat, but will burn in the presence of a naked flame.

8.7 When the products are used unsupported, there is a risk that fire can spread if it is accidentally ignited during maintenance works, eg by a roofer's or plumber's torch. Care should be taken during building and maintenance to avoid the material becoming ignited.

9 Proximity of flues and appliances

When the products are 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, paragraph 2.15

Scotland — Mandatory Standard 3.19, clauses 3.19.1⁽¹⁾ and 3.19.4⁽¹⁾

(1) Technical Handbook (Domestic).

Northern Ireland — Technical Booklet L, paragraph 3.9.

10 Air leakage

10.1 When tested to BS EN 12114 : 2000 with positive pressure of 50 Pa, the products achieved a leakage rate of $0.19 \text{ m}^3\cdot\text{h}^{-1}\cdot\text{m}^{-2}$.

10.2 When used as a VCL and an air barrier, the products' effectiveness is reliant on the careful sealing of the laps, joints, perimeters and penetrations, in accordance with the Certificate holder's instructions.

10.3 The airtightness of the building will also be dependent on the performance of the other building elements.

11 Maintenance

As the products are confined within a roof structure and have suitable durability (see section 12), maintenance is not required.

12 Durability



The products will have a life equivalent to that of the roof structure in which they are incorporated.

Installation

13 General

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

13.2 During construction, care must be taken to ensure the products are not damaged during installation. Should damage occur by tearing, the products should be repaired by covering the holes with tape (see also section 14.5) or replaced.

13.3 The products should be fixed across rafters using double-sided tape, nails or staples of at least 14 mm length.

13.4 The products must have overlap joints of at least 50 mm and be taped along the entire length of the joint with tape (see section 1.3).

13.5 When the products are cut to fit around openings, eg the roof perimeter, care should be taken to minimise gaps.

13.6 The products can be cut using sharp scissors or a knife.

13.7 Any exposed cut edges of the products should be sealed with an adhesive tape as specified in section 1.3.

14 Procedure

Below rafters installation

14.1 Installation starts from the ridge with the products being unrolled parallel to the eaves.

14.2 The next roll must overlap the preceding layer by at least 50 mm, and the overlap should be sealed along the entire length using tape (see section 1.3).

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

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

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

14.6 Plasterboard is fixed to the battens. The batten size should be at least 38 mm by 50 mm, with the fixings at 150 mm spacing for nails. This batten size should be sufficient to ensure a 20 mm air gap between the product and the plasterboard.

Additional insulation

14.7 When installing with other additional insulation materials, care should be taken to ensure that all gaps are maintained in accordance with the Certificate holder's instructions for their products.

14.8 When the products are installed below the rafters, mineral wool products can be placed between the rafters without an air space.

14.9 Foil-faced insulation products can be placed with a gap above or below the insulation when installed 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

15 Tests

Tests were carried out on TLX Silver and TLX Silver FB for Pitched Roofs and the results assessed to determine the resistance of the airspace and durability of the outer foil.

- emissivity
- thermal resistance in the heat flow meter.
- water vapour resistance
- tensile strength
- resistance to water penetration
- reaction to fire classification
- artificial ageing behaviour.

16 Investigations

16.1 The manufacturing process was evaluated, including the methods adopted for quality control, and details were obtained of the quality and composition of the materials used.

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

Bibliography

- BS 5250 : 2011 *Code of practice for control of condensation in buildings*
- BS 5534 : 2014 *Slating and tiling for pitched roofs and vertical cladding — Code of Practice*
- BS EN 12114 : 2000 *Thermal performance of buildings — Air permeability of building components and building elements — Laboratory test method*
- BS EN 13501-1 : 2007 *Fire classification of construction products and building elements — Classification using test data from reaction to fire tests*
- BS EN 13984 : 2013 *Flexible sheets for waterproofing — Plastic and rubber vapour control layers — Definitions and characteristics*
- BS EN ISO 6946 : 2007 *Building components and building elements — Thermal resistance and thermal transmittance — Calculation method*
- BBA Information Bulletin No 3 *Reflective foil insulation — Conventions for U value calculations*
- BRE Digest 369 : 1992 *Interstitial condensation and fabric degradation*
- BRE Report (BR 262 : 2002) *Thermal insulation: avoiding risks*
- BRE Report (BR 443 : 2006) *Conventions for U-value calculations*

17 Conditions

17.1 This Certificate:

- relates only to the product/system that is named and described on the front page
- is issued only to the company, firm, organisation or person named on the front page — no other company, firm, organisation or person may hold or claim that this Certificate has been issued to them
- 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.

17.2 Publications, documents, specifications, legislation, regulations, standards and the like referenced in this Certificate are those that were current and/or deemed relevant by the BBA at the date of issue or reissue of this Certificate.

17.3 This Certificate will remain valid for an unlimited period provided that the product/system and its manufacture and/or fabrication, including all related and relevant parts and 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.

17.4 The BBA has used due skill, care and diligence in preparing this Certificate, but no warranty is provided.

17.5 In issuing this Certificate, the BBA is not responsible and is excluded from any liability to any company, firm, organisation or person, for any matters arising directly or indirectly from:

- 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
- actual installations of the product/system, including their nature, design, methods, performance, workmanship and maintenance
- any works and constructions in which the product/system is installed, including their nature, design, methods, performance, workmanship and maintenance
- any loss or damage, including personal injury, howsoever caused by the product/system, including its manufacture, supply, installation, use, maintenance and removal
- any claims by the manufacturer relating to CE marking.

17.6 Any information relating to the manufacture, supply, installation, use, maintenance and removal 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, maintained and removed. It does not purport in any way to restate the requirements of the Health and Safety at Work etc. Act 1974, or of any other statutory, common law or other duty which may exist at the date of issue or reissue 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.