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BBA APPROVAL INSPECTION TESTING CERTIFICATION
TECHNICAL APPROVALS FOR CONSTRUCTION

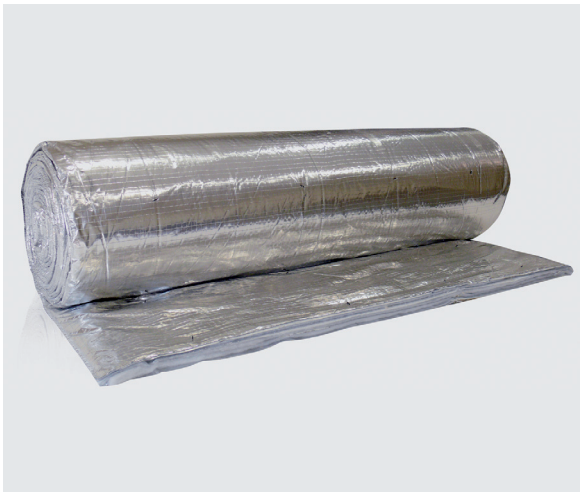
Agrément Certificate
17/5388
Product Sheet 1

YBS MULTI-LAYER INSULATION

SUPERQUILT

This Agrément Certificate Product Sheet(1) relates to SuperQuilt, a multi-layer reflective foil insulation for use in pitched roofs under the rafters as a single layer in new and existing domestic buildings, including dormer cheeks and dwarf wall applications.

(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 product has an emissivity of 0.03 for the outer foil, and a declared core thermal resistance of 1.35 $m^2 \cdot K \cdot W^{-1}$ (see section 6).

Condensation risk — the product can contribute to limiting the risk of condensation (see section 7).

Durability — under normal conditions, the product will have a life equivalent to that of the roof structure in which it is incorporated (see section 11).

The BBA has awarded this 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

Date of First issue: 27 January 2017

John Albon — Head of Approvals
Construction Products

Claire Curtis-Thomas
Chief Executive

Certificate amended on 03 August 2017 to show update of nominal characteristic.

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

Regulations

In the opinion of the BBA, SuperQuilt, if installed, used and maintained in accordance with this Certificate, can satisfy or 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)	Resistance to moisture
Comment:		The product can contribute to satisfying this Requirement. See sections 7.1 and 7.6 of this Certificate.
Requirement:	L1(a)(i)	Conservation of fuel and power
Comment:		The product can contribute to satisfying this Requirement. See section 6 of this Certificate.
Regulation:	7	Materials and workmanship
Comment:		The product is acceptable. See section 11 and the *Installation* 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 performance values for new dwellings (applicable to Wales only)
Comment:		The product can contribute to satisfying these Regulations although compensating fabric and/or services measures will need to be taken. 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 product is acceptable. See section 11 and the *Installation* part of this Certificate.
Regulation:	9	Building standards applicable to construction
Standard:	3.15	Condensation
Comment:		The product 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 7.7 of this Certificate.
Standard:	6.1(b)	Carbon dioxide emissions
Standard:	6.2	Building insulation envelope
Comment:		The product can contribute to satisfying clauses (or parts of) 6.1.1[(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)(b)	Statement of sustainability
Comment:		The product 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 (see section 6.1 of this Certificate). 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 6.3 of this Certificate.
Regulation:	12	Building standards applicable to conversions
Comment:		All comments given for the product 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).

The Building Regulations (Northern Ireland) 2012 (as amended)

Regulation:	23	Fitness of materials and workmanship
Comment:		The product is acceptable. See section 11 and the *Installation* part of this Certificate.
Regulation:	29	Condensation
Comment:		The product 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 product can contribute to satisfying these Regulations. See section 6 of this Certificate.

Construction (Design and Management) Regulations 2015

Construction (Design and Management) Regulations (Northern Ireland) 2016

Information in this Certificate may assist the client, designer (including Principal Designer) and contractor (including Principal Contractor) to address their obligations under these Regulations.

See sections: 3 *Delivery and site handling* (3.3 and 3.5) and 8 *Behaviour in relation to fire* (8.7) of this Certificate.

Additional Information

NHBC Standards 2017

In the opinion of the BBA, SuperQuilt, for pitched roof applications, if installed, used and maintained in accordance with this Certificate, can satisfy or contribute to satisfying the relevant requirements in relation to *NHBC Standards*, Chapter 7.2 *Pitched Roofs*.

CE marking

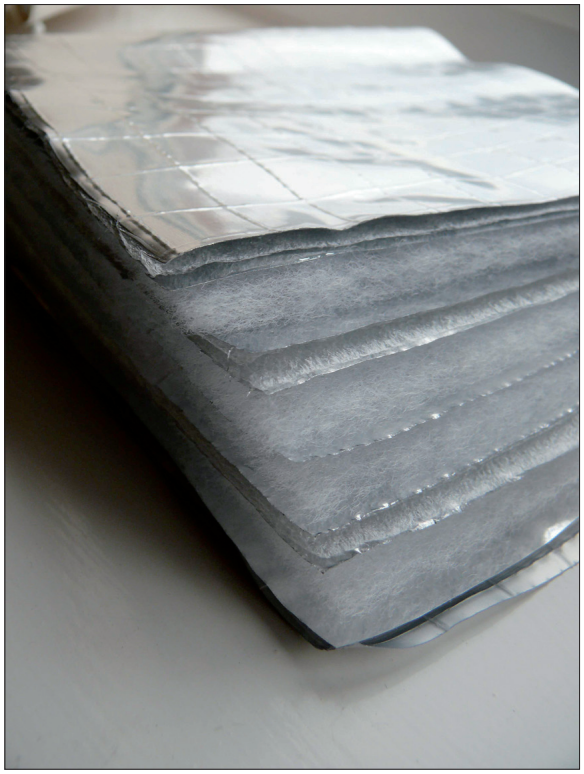
The Certificate holder has taken the responsibility of CE marking the product in accordance with harmonised European Standard BS EN 13984 : 2013 for its vapour control layer property. An asterisk (*) appearing in this Certificate indicates that data shown are given in the manufacturer's Declaration of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

Technical Specification

1 Description

1.1 SuperQuilt is a 42 mm multi-layer flexible insulation made up of 19 separate layers, including reflective foil, expanded polyethylene and polyester wadding. See Figure 1.

Figure 1 Multi-layer insulation



1.2 YBS self-adhesive foil-tape (75 mm) is used to seal overlaps, enabling the product to act as a vapour control layer.

1.3 The product has the following nominal dimensions:

Table 1 Nominal dimensions

Dimensions	SuperQuilt
Thickness (mm)	42
Weight ($g \cdot m^{-2}$)	800
Roll length (m)	5 and 10
Width (mm)	1200 and 1500
Area (m^2)	7.5, 12 and 15

1.4 Ancillary items for use with this product but outside the scope of this Certificate are:

- stainless steel or galvanized steel staples
- pre-treated timber battens
- YBS self-adhesive foil-tape
- additional insulation materials.

2 Manufacture

2.1 All nineteen layers of foil, foam and wadding are stitched together with nylon thread, approximately 8 mm from the edges.

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 product is wrapped in polythene and delivered to site as rolls on pallets. Each roll is labelled with the product name, weight, dimensions and the name of the manufacturer and Certificate holder.

3.2 The product should be stored in clean dry conditions, preferably under cover and out of direct sunlight. Care must be taken to store the product away from solvents. The product must not be used if allowed to get wet or damaged.

3.3 The product must not come into contact with naked flames or other ignition sources.

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

3.5 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 SuperQuilt.

Design Considerations

4 General

4.1 SuperQuilt is designed for use as a flexible insulation in conjunction with other insulation materials to reduce the thermal transmittance (U value) in new or existing domestic pitched roofs. The product is installed under the rafters, and can also be used for dormer cheeks and dwarf walls in the loft area.

4.2 Additional insulation will be required in order to meet the thermal requirements of the national Building Regulations.

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

4.4 Care must be taken to ensure the product is covered after installation, as it must not be exposed to rain.

4.5 In addition, care must be taken to ensure the product does not come into contact with heat sources greater than 80°C.

4.6 Plasterboard used in conjunction with the product must comply with BS EN 520 : 2004 and be installed in accordance with BS 8212 : 1995.

4.7 Penetration of the product by services should be kept to a minimum. At any joints, the product should be overlapped by a minimum of 50 mm and sealed with the YBS self-adhesive foil-tape.

4.8 Roof tiles or slates, designed and constructed in accordance with the relevant clauses of BS 5534 : 2014, are installed on pitched roofs.

5 Practicability of installation

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

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:

1.35 $m^2 \cdot K \cdot W^{-1}$	*R* value for SuperQuilt core (42 mm thick) with no air gaps either side
0.03	outer surface emissivity
0.47 $m^2 \cdot K \cdot W^{-1}$	*R*[1] value of an air cavity adjacent to the product ≥ 13 mm thick (upward heat flow)
0.23 $m^2 \cdot K \cdot W^{-1}$	*R*[2] value of product when compressed between rafters and battens, to a nominal 7 mm thickness.

(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 (available on the 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.

Table 2 Typical U Value for existing pitched roof construction[1][2]

Construction	Total rafter depth (mm)	Batten depth (mm)	Additional phenolic insulation thickness[1] (mm)	U value ($W \cdot m^{-2} \cdot K^{-1}$)
Under rafter	175	38	95	0.18

(1) Phenolic insulation — conductivity 0.020 $W \cdot m^{-1} \cdot K^{-1}$ and emissivity 0.2, thickness rounded to nearest 5 mm.
(2) Original rafter dimensions of 100 by 50 mm at 400 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 product will adequately limit the risk of interstitial condensation when they are designed and constructed in accordance with BS 5250 : 2011 Annexes D and H and BRE Report BR 262 : 2002.

7.2 The product has a typical water vapour resistance* of 23,000 $MN \cdot s \cdot g^{-1}$, in accordance with BS EN 1931 : 2000.

7.3 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.

7.4 The product has a high water vapour resistance and can act as a vapour control layer. 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 account.

7.5 Due consideration must be taken 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

7.6 Roofs incorporating the product will adequately limit the risk of surface condensation when the thermal transmittance (U value) does not exceed 0.35 $W \cdot m^{-2} \cdot K^{-1}$ at any point and the junctions with walls are designed in accordance with the guidance referred to in section 6.3 of this Certificate.

7.7 Roofs will adequately limit the risk of surface condensation when the thermal transmittance (U value) does not exceed 1.2 $W \cdot m^{-2} \cdot K^{-1}$ 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 SuperQuilt has a reaction to fire classification of Class E 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 product will be contained between the roof and internal lining board, until one is destroyed. Therefore, the product will not contribute to the development stage of a fire or present a smoke or toxic hazard.

8.4 The use of the product 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 the additional insulation materials must be taken into account.

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

8.7 When the product is 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), therefore care should be taken during building and maintenance to avoid the material becoming ignited.

9 Proximity of flues and appliances

When installing the product in close proximity to certain flue pipes and/or heat-producing appliances, the following provisions to the national Building Regulations are acceptable:

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 Maintenance

As the product is confined within a roof structure and has suitable durability (see section 11), maintenance is not required.

11 Durability

The product will have a life equivalent to that of the roof structure in which it is incorporated.

Installation

12 General

12.1 Installation of SuperQuilt and tape must be in accordance with the Certificate holder's instructions.

12.2 The product can be cut with a sharp craft knife or a sharp pair of scissors.

12.3 At each joint, the product should be overlapped by a minimum of 50 mm and sealed with 75 mm YBS self-adhesive foil-tape.

12.4 The product must be secured effectively, which can be achieved by using 14 mm (minimum) stainless steel or galvanized steel staples installed at regular intervals (typically 300 mm centres).

13 Procedure

13.1 The product should be rolled out under the clean, prepared rafters, typically in a horizontal orientation, and pulled tight then stapled securely to the underside of the rafters.

13.2 At the eaves, the product is cut tightly around the rafters and sealed with 75 mm YBS foil adhesive tape to the cavity wall insulation or wall plate.

13.3 Timber battens (typically 38 mm by 47 mm) are secured horizontally at right angles to the rafters at 600 mm centres.

13.4 Any openings in the roof structure should be supported by additional timber battens around the opening.

13.5 A suitable internal plasterboard is then fixed to the horizontal battens.

13.6 Any penetrations through the product should be sealed with the foil adhesive tape.

Technical Investigations

14 Tests

Test were carried out by the BBA on SuperQuilt to determine:

- resistance to tearing before and after ageing
- peel strength before and after ageing.

15 Investigations

15.1 Data was examined relating to:

- dimensions
- water vapour resistance
- tensile strength
- elongation
- water vapour resistance after ageing
- core thermal resistance
- emissivity
- durability checks after ageing
- calculation of thermal resistance of air gaps adjacent to the product in its different applications
- a quality plan was drawn up for production control at the factory
- U value calculations and condensation risk analysis.

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

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 8212 : 1995 *Code of practice for dry lining and partitioning using gypsum plasterboard*

BS EN 520 : 2004 *Gypsum plasterboards — Definitions, requirements and test methods*

BS EN 1931 : 2000 *Flexible sheets for waterproofing — Bitumen, plastic and rubber sheets for roof waterproofing — Determination of water vapour transmission properties*

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*

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*

16 Conditions

16.1 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.

16.2 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.

16.3 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.

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

16.5 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.

16.6 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.

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