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### Agrément Certificate

24/7114

Product Sheet 5 Issue 1

## ECOTHERM ECO RANGE FOR FLOORS, WALLS AND PITCHED ROOFS

### ECOTHERM ECO-VERSAL BOARD FOR PITCHED ROOFS

This Agrément Certificate Product Sheet<sup>(1)</sup> relates to EcoTherm Eco-Versal Board for Pitched Roofs, a rigid polyisocyanurate (PIR) foam board with a composite foil-facing on both sides. The product is for use as insulation in tiled and slated pitched roof constructions with a roof pitch of less than 70°, where the ceiling follows the pitch of the roof and encloses a habitable space or where the ceiling is horizontal and encloses a loft space, in new and existing domestic and non-domestic buildings.

(1) Hereinafter referred to as 'Certificate'.

#### The assessment includes

##### Product factors:

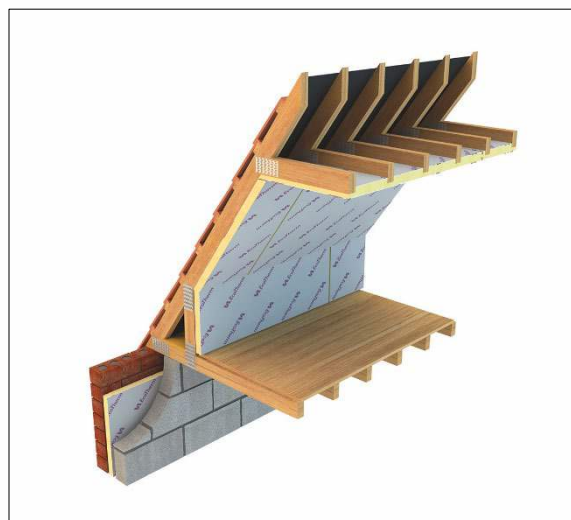
- compliance with Building Regulations
- compliance with additional regulatory or non-regulatory information where applicable
- evaluation against technical specifications
- assessment criteria and technical investigations
- uses and design considerations

##### Process factors:

- compliance with Scheme requirements
- installation, delivery, handling and storage
- production and quality controls
- maintenance and repair

##### Ongoing contractual Scheme elements†:

- regular assessment of production
- formal 3-yearly review



#### KEY FACTORS ASSESSED

- Section 1. Mechanical resistance and stability
- Section 2. Safety in case of fire
- Section 3. Hygiene, health and the environment
- Section 4. Safety and accessibility in use
- Section 5. Protection against noise
- Section 6. Energy economy and heat retention
- Section 7. Sustainable use of natural resources
- Section 8. Durability

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 issue: 26 March 2024

Hardy Giesler  
Chief Executive Officer

*This BBA Agrément Certificate is issued under the BBA's Inspection Body accreditation to ISO/IEC 17020. Sections marked with † are not issued under accreditation.*

*The BBA is a UKAS accredited Inspection Body (No. 4345), Certification Body (No. 0113) and Testing Laboratory (No. 0357).*

*Readers MUST check that this is the latest issue of this Agrément Certificate by either referring to the BBA website or contacting the BBA directly.*

*The Certificate should be read in full as it may be misleading to read clauses in isolation.*

*Any photographs are for illustrative purposes only, do not constitute advice and should not be relied upon.*

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## SUMMARY OF ASSESSMENT AND COMPLIANCE

This section provides a summary of the assessment conclusions; readers should refer to the later sections of this Certificate for information about the assessments carried out.

### Compliance with Regulations

Having assessed the key factors, the opinion of the BBA is that EcoTherm Eco-Versal Board for Pitched Roofs, 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 Building Regulations 2010 (England and Wales) (as amended)

<b>Requirement:</b>	<b>C2(c)</b>	<b>Resistance to moisture</b>
<b>Comment:</b>		The product can contribute to satisfying this Requirement. See section 3 of this Certificate.
<b>Requirement:</b>	<b>L1(a)(i)</b>	<b>Conservation of fuel and power</b>
<b>Comment:</b>		The product can contribute to satisfying this Requirement. See section 6 of this Certificate.
<b>Regulation:</b>	<b>7(1)</b>	<b>Materials and workmanship</b>
<b>Comment:</b>		The product is acceptable. See sections 8 and 9 of this Certificate.
<b>Regulation:</b>	<b>25B</b>	<b>Nearly zero-energy requirements for new buildings</b>
<b>Regulation:</b>	<b>26</b>	<b>CO<sub>2</sub> emission rates for new buildings</b>
<b>Regulation:</b>	<b>26A</b>	<b>Fabric energy efficiency rates for new dwellings (applicable to England only)</b>
<b>Regulation:</b>	<b>26A</b>	<b>Primary energy rates for new buildings (applicable to Wales only)</b>
<b>Regulation:</b>	<b>26B</b>	<b>Fabric performance values for new dwellings (applicable to Wales only)</b>
<b>Regulation:</b>	<b>26C</b>	<b>Target primary energy rates for new buildings (applicable to England only)</b>
<b>Regulation:</b>	<b>26C</b>	<b>Energy efficiency rating (applicable to Wales only)</b>
<b>Comment:</b>		The product can contribute to satisfying these Regulations. See section 6 of this Certificate.



#### The Building (Scotland) Regulations 2004 (as amended)

<b>Regulation:</b>	<b>8(1)</b>	<b>Fitness and durability of materials and workmanship</b>
<b>Comment:</b>		The product is acceptable. See sections 8 and 9 of this Certificate.
<b>Regulation:</b>	<b>9</b>	<b>Building standards – construction</b>
<b>Standard:</b>	<b>3.15</b>	<b>Condensation</b>
<b>Comment:</b>		The product can contribute to satisfying this Standard, with reference to clauses 3.15.1 <sup>(1)(2)</sup> , 3.15.3 <sup>(1)(2)</sup> , 3.15.4 <sup>(1)(2)</sup> , 3.15.5 <sup>(1)(2)</sup> and 3.15.7 <sup>(1)(2)</sup> . See section 3 of this Certificate.
<b>Standard:</b>	<b>6.1(b)(c)</b>	<b>Energy demand</b>
<b>Comment:</b>		The product can contribute to satisfying this Standard, with reference to clauses 6.1.1 <sup>(1)</sup> and 6.1.2 <sup>(2)</sup> . See section 6 of this Certificate.
<b>Standard:</b>	<b>6.2</b>	<b>Building insulation envelope</b>
<b>Comment:</b>		The product can contribute to satisfying this Standard, with reference to clauses, or parts of clauses, 6.2.1 <sup>(1)(2)</sup> , 6.2.3 <sup>(1)</sup> , 6.2.4 <sup>(2)</sup> , 6.2.6 <sup>(1)</sup> , 6.2.7 <sup>(1)(2)</sup> , 6.2.8 <sup>(1)(2)</sup> , 6.2.9 <sup>(1)(2)</sup> , 6.2.10 <sup>(1)(2)</sup> , 6.2.11 <sup>(2)</sup> and 6.2.12 <sup>(1)</sup> . 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 at least a bronze level of sustainability as defined in this Standard. In addition, the product can contribute to a construction meeting a higher level of sustainability as defined in this Standard, with reference to clauses 7.1.4 <sup>(1)</sup> , 7.1.6 <sup>(1)(2)</sup> , 7.1.7 <sup>(1)</sup> , 7.1.9 <sup>(2)</sup> and 7.1.10 <sup>(2)</sup> . See section 6 of this Certificate.
Regulation:	12	<b>Building standards – conversion</b>
Comment:		Comments made in relation to the product under Regulation 9, Standards 1 to 6, also apply to this Regulation, with reference to clause 0.12.1 <sup>(1)(2)</sup> and Schedule 6 <sup>(1)(2)</sup> .
		(1) Technical Handbook (Domestic).
		(2) Technical Handbook (Non-Domestic).



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

Regulation:	23(1)(a)(i)	<b>Fitness of materials and workmanship</b>
Comment:	(iii)(b)(i)(ii)	The product is acceptable. See sections 8 and 9 of this Certificate.
Regulation:	29	<b>Condensation</b>
Comment:		The product can contribute to satisfying this Regulation. See section 3 of this Certificate.
Regulation:	39(a)(i)	<b>Conservation measures</b>
Comment:		The product can contribute to satisfying this Regulation. See section 6 of this Certificate.
Regulation:	40(2)	<b>Target carbon dioxide emission rate</b>
Regulation:	43(1)(2)	<b>Renovation of thermal elements</b>
Regulation:	43B	<b>Nearly zero-energy requirements for new buildings</b>
Comment:		The product can contribute to satisfying these Regulations. See section 6 of this Certificate.

## Additional Information

### NHBC Standards 2024

In the opinion of the BBA, EcoTherm Eco-Versal Board for Pitched Roofs, 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*.

## Fulfilment of Requirements

The BBA has judged EcoTherm Eco-Versal Board for Pitched Roofs to be satisfactory for use as described in this Certificate. The product has been assessed for use as insulation in tiled and slated pitched roof constructions with a roof pitch of less than 70°, where the ceiling follows the pitch of the roof and encloses a habitable space or where the ceiling is horizontal and encloses a loft space, in new and existing domestic and non-domestic buildings.

## ASSESSMENT

### Product description and intended use

The Certificate holder provided the following description for the product under assessment. EcoTherm Eco-Versal Board for Pitched Roofs consists of a rigid polyisocyanurate (PIR) foam board, faced on both sides with a low-emissivity aluminium Kraft trilaminate foil.

The product has the nominal characteristics given in Table 1.

*Table 1 Nominal characteristics of EcoTherm Eco-Versal Board for Pitched Roofs<sup>(1)</sup>*

Characteristic (unit)	Value
Length (mm)	2400
Width (mm)	1200
Thickness (mm)	20 to 150
Edge profile	Plain

(1) Other board dimensions are available on request.

#### Ancillary Items

The Certificate holder recommends the following ancillary items for use with the product, but these materials have not been assessed by the BBA and are outside the scope of this Certificate:

- roof tile underlay, installed draped, or fully supported with counter battens
- nailable sarking clips
- helical fixings
- aluminium tape
- galvanized slab nails
- nails and treated timber battens.

#### Applications

The product is intended for use as insulation between, under and over roof rafters in conjunction with permeable Low Resistance (LR) roof tile underlays or conventional High Resistance (HR) roof tile underlays, timber counter battens and tiling battens.

### Product assessment – key factors

The product was assessed for the following key factors, and the outcome of the assessment is shown below. Conclusions relating to the Building Regulations apply to the whole of the UK unless otherwise stated.

## 1 Mechanical resistance and stability

Data were assessed for the following characteristic.

#### 1.1 Behaviour under loading

The compressive strength of the product was assessed, and the result is given in Table 2.

*Table 2 Compressive strength*

Product assessed	Assessment method	Requirement	Result
EcoTherm Eco-Versal Board for Pitched Roofs	BS EN 826 : 2013	Value achieved	> 140 kPa

## 2 Safety in case of fire

Data were assessed for the following characteristics.

### 2.1 Reaction to fire

2.1.1 The product was tested for reaction to fire and the classification is given in Table 3.

*Table 3 Reaction to fire classification*

Product assessed	Assessment method	Requirement	Result
EcoTherm Eco-Versal Board for Pitched Roofs	BS EN 13501-1 : 2018	Value achieved	F

2.1.2 On the basis of data assessed, the product will be restricted in use under the documents supporting the national Building Regulations, in some cases.

2.1.3 Designers must refer to the relevant national Building Regulations and guidance for detailed conditions of use, particularly in respect of requirements for substrate fire performance, cavity closers and barriers, fire stopping of service penetrations and combustibility limitations for other materials and components used in the overall construction.

### 2.2 Resistance to fire

Once installed, except for non-habitable loft applications, the product must be contained by a fire-resistant lining board manufactured in accordance with BS EN 520 : 2004, with joints fully sealed and supported by rafters, noggins, or battens.

## 3 Hygiene, health and the environment

Data were assessed for the following characteristic.

### 3.1 Water vapour permeability

3.1.1 The product was tested for water vapour permeability and the results are given in Table 4.

*Table 4 Water vapour resistance/resistivity*

Material	Assessment method	Requirement	Result
PIR insulation core	BS EN 12086 : 1997	Value achieved	52 MN·s·g <sup>-1</sup> ·m <sup>-1</sup>
Composite foil-facing	Method B		111 MN·s·g <sup>-1</sup>

3.1.2 For the purposes of assessing the risk of interstitial condensation, the water vapour resistance/resistivity values may be taken as those stated in Table 4.

## 4 Safety and accessibility in use

Not applicable.

## 5 Protection against noise

Not applicable.

## 6 Energy economy and heat retention

Data were assessed for the following characteristics.

### 6.1 Thermal conductivity

The product was tested for thermal conductivity and the result is given in Table 5.

*Table 5 Thermal conductivity*

Product assessed	Assessment method	Requirement	Result
EcoTherm Eco-Versal Board for Pitched Roofs (all thicknesses)	BS EN 13165 : 2012	Declared value ( $\lambda_D$ )	0.022 W·m <sup>-1</sup> ·K <sup>-1</sup>

### 6.2 Thermal performance

The foil-facing was tested for emissivity and the result is given in Table 6.

*Table 6 Emissivity of the foil-facing*

Product assessed	Assessment method	Requirement	Result
Composite foil-facing	BS EN 15976 : 2011	Declared value	0.05

### 6.3 Conservation of fuel and power

6.3.1 Example U values are given in Table 7.

*Table 7 Examples U values — pitched roof*

Target U value (W·m <sup>-2</sup> ·K <sup>-1</sup> )	Insulation thickness (mm)	
	System 1	System 2
	Over and between rafters <sup>(1)</sup> (W·m <sup>-2</sup> ·K <sup>-1</sup> )	Under and between rafters <sup>(2)</sup> (W·m <sup>-2</sup> ·K <sup>-1</sup> )
0.09	130 + 120	— <sup>(3)</sup>
0.11	105 + 100	115 + 100
0.12	95 + 90	100 + 100
0.13	90 + 80	95 + 90
0.15	75 + 70	80 + 80
0.16	70 + 65	75 + 75
0.18	60 + 60	70 + 65
0.20	55 + 50	60 + 60

(1) Pitched roof construction – pitched roof tiles, no underlay or boards, insulation secured over the rafters with 6.7 helical fixings per m<sup>2</sup> of stainless steel ( $\lambda = 17$  W·m<sup>-1</sup>·K<sup>-1</sup>) with a cross-sectional area of 7.45 mm<sup>2</sup>, insulation fitted tightly between the 35 by 150 mm deep timber rafters at 600 mm centres (12.5%;  $\lambda = 0.13$  W·m<sup>-1</sup>·K<sup>-1</sup>), with a low-e ( $\epsilon_D = 0.05$ ) air cavity between the timbers, and 12.5 mm gypsum plasterboard ( $\lambda = 0.25$  W·m<sup>-1</sup>·K<sup>-1</sup>).

(2) Pitched roof construction – pitched roof tiles, no underlay or boards, minimum 50 mm ventilated cavity above the insulation fitted tightly between the 35 by 150 mm deep timber rafters at 600 mm centres (12.5%;  $\lambda = 0.13$  W·m<sup>-1</sup>·K<sup>-1</sup>), insulation, and 12.5 mm gypsum plasterboard ( $\lambda = 0.25$  W·m<sup>-1</sup>·K<sup>-1</sup>).

(3) Can be achieved with System 1.

6.3.2 The U value of a completed roof will depend on the insulation thickness, the number and type of fixings, the roof structure and its internal finish.

6.3.3 The product can contribute towards a construction satisfying the national Building Regulations in respect of energy economy and heat retention.

## 7 Sustainable use of natural resources

Not applicable.

## 8 Durability

8.1 The potential mechanisms for degradation and the known performance characteristics of the materials in the product were assessed.

8.2 Specific test data were assessed, as given in Table 8.

*Table 8 Durability tests*

Product assessed	Assessment method	Requirement	Result
EcoTherm Eco-Versal Board for Pitched Roofs	Dimensional stability to BS EN 1604 : 2013 (70°C and 90% RH for 48 hours)	Length and width $\leq 2\%$ change Thickness $\leq 6\%$ change	Pass
	Thermal conductivity to BS EN 13165 : 2012 (70°C for 21 days)	$\lambda_D \leq 0.022 \text{ W}\cdot\text{m}^{-1}\cdot\text{K}^{-1}$	Pass

### 8.3 Service life

Under normal service conditions, the product will have a life equivalent to the structure in which it is incorporated, provided it is designed, installed and maintained in accordance with this Certificate and the Certificate holder's instructions.

## PROCESS ASSESSMENT

Information provided by the Certificate holder was assessed for the following factors:

## 9 Design, installation, workmanship and maintenance

### 9.1 Design

9.1.1 The design process was assessed, and the following requirements apply in order to satisfy the performance assessed in this Certificate.

9.1.2 Roofs must be designed and constructed in accordance with the relevant clauses of BS 5250 : 2021 and BS 5534 : 2014, and BS EN 1995-1-1 : 2004 and its UK National Annex.

9.1.3 Design wind loading will depend largely on the building geometry and its geographical location, and must be calculated by a suitably experienced and competent individual in accordance with the principles of BS EN 1991-1-4 : 2005 and its UK National Annex. Snow loadings must be calculated in accordance with the principles of BS EN 1991-1-3 : 2003 and its UK National Annex.

9.1.4 The Certificate holder and fixing manufacturer must advise on the use of the correct proprietary fixings and fixing capacity, but such advice is outside the scope of this Certificate. When considering this, and calculating the fixing spacing required to resist the calculated loadings, the requirements of BS EN 1995-1-1 : 2004 and its National Annex must be followed.

9.1.5 Vapour permeable roof tile underlays used in conjunction with the product must have a current BBA Certificate and must be used in accordance with, and within the limitations of, that Certificate.

9.1.6 It is essential that detailing and jointing of the boards achieves a convection-free envelope of high vapour resistance. Any gaps must be filled and/or taped. Ridges, abutments and penetrations must also be sealed. Flue pipes passing through the insulation must be suitably sleeved.

9.1.7 A ventilated air space of minimum depth 50 mm may be required between the underside of the roof tile underlay and the upper face of the product, dependent on the specification of the roof tile underlay used (see section 9.1.11).

9.1.8 Calculations of the thermal transmittance (U value) of a roof must be carried out in accordance with BS EN ISO 6946 : 2017 and BRE Report BR 443 : 2019.

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

#### *Interstitial condensation*

9.1.10 Roofs will adequately limit the risk of interstitial condensation when they are designed and constructed in accordance with BS 5250 : 2021.

9.1.11 When installed with tightly butted joints and filled/sealed gaps and joints, the product will provide a continuous convection-free envelope of high vapour resistance. Therefore, a suitable vapour-permeable LR roof tile underlay may be laid over the insulation boards without ventilated air space, unless the tiles/slates are tight fitting as defined in BS 5250 : 2021. When using an HR underlay, the space below it must be ventilated in accordance with BS 5250 : 2021.

9.1.12 Where the product is installed in a roof with either a horizontal or sloping ceiling (ie room-in-the-roof), a 'warm roof' space is created and ventilation must be designed in accordance with BS 5250 : 2021. However, any insulation in a horizontal ceiling must be removed.

9.1.13 Where high humidity may be expected, an air and vapour control layer (AVCL), such as 0.125 mm thickness polyethylene with sealed and lapped joints, must also be installed unless a site-specific condensation risk analysis in accordance with BS 5250 : 2021 indicates otherwise.

#### *Surface condensation*

9.1.14 In England and Wales, roofs will adequately limit the risk of surface condensation when the thermal transmittance (U value) does not exceed  $0.35 \text{ W} \cdot \text{m}^{-2} \cdot \text{K}^{-1}$  at any point, and the junctions with walls are designed in accordance with section 9.1.9 of this Certificate.

9.1.15 In Scotland, 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 : 2021. Further guidance may be obtained from BRE Report BR 262 : 2002 and section 9.1.9 of this Certificate.

## 9.2 Installation

9.2.1 Installation instructions provided by the Certificate holder were assessed and judged to be appropriate and adequate.

9.2.2 Installation must be carried out in accordance with this Certificate and the Certificate holder's instructions. A summary of instructions and guidance is provided in Annex A of this Certificate.

9.2.3 During installation, care must be taken to ensure that the product is not subjected to any construction or foot traffic loads. Roof timbers of adequate strength must be used to support such loads.

9.2.4 It is important to ensure a tight fit between boards, between boards and rafters, and between boards and other detailed elements. At ridges and verges, boards must be cut to achieve tightly butted joints.

9.2.5 It is important to fill/seal gaps and joints in the insulation envelope, including at all service penetrations. See section 9.1.6.

9.2.6 Tiling battens of 25 by 50 mm or 38 by 50 mm dimensions must be installed on rafters at no more than 600 mm centres, depending on the requirement following the calculations referred to in section 9.1.4 of this Certificate. See also BS 5534 : 2014, Table 3.



### 9.3 Workmanship

Practicability of installation was assessed on the basis of the Certificate holder's information. To achieve the performance described in this Certificate, installation of the product must be carried out by a competent general builder, or a contractor, experienced with this type of product.

### 9.4 Maintenance and repair

Once installed, provided that the roof tiles/slates are maintained in a weathertight condition, maintenance is not required.

## **10 Manufacture**

10.1 The production processes for the product have been assessed, and provide assurance that the quality controls are satisfactory according to the following factors:

10.1.1 The manufacturer has provided documented information on the materials, processes, testing and control factors.

10.1.2 The quality control operated over batches of incoming materials has been assessed and deemed appropriate and adequate.

10.1.3 The quality control procedures and product testing to be undertaken have been assessed and deemed appropriate and adequate.

10.1.4 The process for management of non-conformities has been assessed and deemed appropriate and adequate.

10.1.5 An audit of each production location was undertaken, and it was confirmed that the production process was in accordance with the documented process, and that equipment has been properly tested and calibrated.

† 10.2 The BBA has undertaken to review 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.

## **11 Delivery and site handling**

11.1 The Certificate holder stated that the product is delivered to site in packaging bearing the Certificate holder's trade name, product description and characteristics, batch number, production date, and the BBA logo incorporating the number of this Certificate.

11.2 Delivery and site handling must be performed in accordance with the Certificate holder's instructions and this Certificate, including:

11.2.1 The product must be protected from prolonged exposure to sunlight and should be stored either under cover or protected with opaque polythene sheeting. Where possible, packs should be stored inside. If outside, the product must be stacked flat, and raised above ground level, away from contact with ground moisture.

11.2.2 Some handling difficulties may be experienced in windy conditions. Care must be exercised to avoid crushing the edges or corners. If damaged, the product must be discarded.

11.2.3 The product must not be exposed to open flame or other ignition sources, or to solvents or other chemicals.

## ANNEX A – SUPPLEMENTARY INFORMATION

Supporting information in this Annex is relevant to the product but has not formed part of the material assessed for the 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.

### CLP Regulations

The Certificate holder has taken the responsibility of classifying and labelling the product and/or components under the *GB CLP Regulation* and *CLP Regulation (EC) No 1272/2008 - classification, labelling and packaging of substances and mixtures*. Users must refer to the relevant Safety Data Sheets.

### UKCA marking

The Certificate holder has taken the responsibility of UKCA marking the product in accordance with Designated Standard EN 13165 : 2012.

### Management Systems Certification for production

The management system of the manufacturer has been assessed and registered as meeting the requirements of BS EN ISO 9001 : 2015 and BS EN ISO 14001 : 2015 by CIBSE Certification Limited (Certificates 0001QMS-0 and 0001EMS-0 respectively for the Pembridge site, and Certificates 0001QMS-1 and 0001EMS-1 respectively for the Selby site).

### Additional information on installation

#### General

A.1 Since the product will not support the weight of operatives, appropriate care must be taken during installation and tiling.

A.2 The product can be cut easily, but care must be taken to prevent damage, particularly on edges. Damaged boards must not be used; small areas of damaged facer may be repaired with self-adhesive aluminium foil tape.

A.3 Cutting should be carried out either by using a fine-toothed saw, or by scoring with a sharp knife, snapping the product over a straight edge and then cutting the facing on the other side.

#### Procedure

#### **Over rafters insulation (single-layer system)**

A.4 The product is laid onto rafters, starting at the stop rail and working towards the ridge so it covers the whole roof area. The boards should be tightly butted and fixed in a staggered pattern. Board joints should be butted over rafters, not mid-span. It is important to ensure a tight fit between boards, boards and rafters, and other detailed elements. At ridges and verges, boards should be cut to achieve a close butt joint.

A.5 Treated counter battens (eg 38 by 38 mm, to suit the fixing manufacturer's specification) should be fixed using helical fixings. These fixings should pass through the counter batten and the insulation and penetrate the supporting timber by a minimum of 37 mm. Short lengths of counter batten should be tightly butted.

A.6 A roof tile underlay should be installed in the appropriate manner, ie fully supported or over counter battens, depending on the type of underlay and in accordance with the appropriate BBA Certificate. The underlay should allow drainage of water over the fascia board and into the gutter at eaves. A continuous timber fillet should be used to support the underlay below the lowest row of tiles.

A.7 If the thickness required for the single-layer application is considered excessive, the double-layer insulation should be considered. Where this necessitates two different board thicknesses, the greatest depth should be placed over the rafter.

#### **Over and between rafters insulation (double-layer system)**

A.8 The product is cut to coincide with the space between the joists. Sarking clips are nailed into the upper surface of each rafter at one-metre intervals up the roof slope, so that the boards will be flush with the top face of the rafter.

A.9 Above rafters, the product is then laid to cover the whole roof area, as described in sections A.4 to A.7.

#### **Under and between rafters insulation**

A.10 Following completion of the roof structure, the product is cut and fitted from the inside, tightly between the rafters and flush with the underside, and butted against stop beads or battens which maintain a ventilated air gap at least 50 mm deep. Where vapour-permeable (LR) roof tile underlays are used, the insulation may be installed without a ventilated air space.

A.11 Where the rafter depth cannot accommodate the required thickness of insulation and maintain the required 50 mm ventilated gap, a second layer of insulation is added to the underside of the rafters. It should always be placed with the long edge running across the joists or rafters, and all edges must be supported.

A.12 The perimeter of the insulation under the rafters should be sealed with a flexible sealant or equivalent.

#### **Finishing**

A.13 The roof tile underlay should be installed in accordance with the manufacturer's instructions and, if applicable, the appropriate BBA Certificate.

A.14 Roof tiles or slates are installed in accordance with the relevant clauses of BS 5534 : 2014.

A.15 Internal lining panels are installed, as appropriate to the application and required decoration.

## Bibliography

- BRE Report BR 262 : 2002 *Thermal insulation: avoiding risks*
- BRE Report BR 443 : 2019 *Conventions for U-value calculations*
- BS 5250 : 2021 *Management of moisture in buildings — Code of practice*
- BS 5534 : 2014 + A2 : 2018 *Slating and tiling for pitched roofs and vertical cladding — Code of practice*
- BS EN 520 : 2004 + A1 : 2009 *Gypsum plasterboards — Definitions, requirements and test methods*
- BS EN 826 : 2013 *Thermal insulating products for building applications — Determination of compression behaviour*
- BS EN 1604 : 2013 *Thermal insulating products for building applications — Determination of dimensional stability under specified temperature and humidity conditions*
- BS EN 1991-1-3 : 2003 + A1 : 2015 *Eurocode 1 : Actions on structures — General actions — Snow loads*
- NA + A2 : 18 to BS EN 1991-1-3 : 2003 + A1 : 2015 *UK National Annex to Eurocode 1 : Actions on structures — General actions — Snow loads*
- BS EN 1991-1-4 : 2005 + A1 : 2010 *Eurocode 1 : Actions on structures — General actions — Wind actions*
- NA to BS EN 1991-1-4 : 2005 + A1 : 2010 *UK National Annex to Eurocode 1 : Actions on structures — General actions — Wind actions*
- BS EN 1995-1-1 : 2004 + A2 : 2014 *Eurocode 5 : Design of timber structures — General — Common rules and rules for buildings*
- NA to BS EN 1995-1-1 : 2004 + A2 : 2014 *UK National Annex to Eurocode 5 : Design of timber structures — General — Common rules and rules for buildings*
- BS EN 12086 : 1997 *Thermal insulating products for building applications — Determination of water vapour transmission properties*
- BS EN 13165 : 2012 + A2 : 2016 *Thermal insulation products for buildings — Factory made rigid polyurethane foam (PU) products — Specification*
- BS EN 13501-1 : 2018 *Fire classification of construction products and building elements — Classification using test data from reaction to fire tests*
- BS EN 15976 : 2011 *Flexible sheets for waterproofing — Determination of emissivity*
- BS EN ISO 6946 : 2017 *Building components and building elements — Thermal resistance and thermal transmittance — Calculation method*
- BS EN ISO 9001 : 2015 *Quality management systems — Requirements*
- BS EN ISO 14001 : 2015 *Environmental management systems — Requirements with guidance for use*

## Conditions of Certificate

### Conditions

1 This Certificate:

- relates only to the product 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.

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.

3 This Certificate will be displayed on the BBA website, and the Certificate Holder is entitled to use the Certificate and Certificate logo, provided that the product 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.

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

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

6 Any information relating to the manufacture, supply, installation, use, maintenance and removal of this product which is contained or referred to in this Certificate is the minimum required to be met when the product 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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