

## Xtratherm UK Ltd

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**Agrément Certificate**

**10/4803**

Product Sheet 1

## XTRATHERM SAFE-R INSULATION

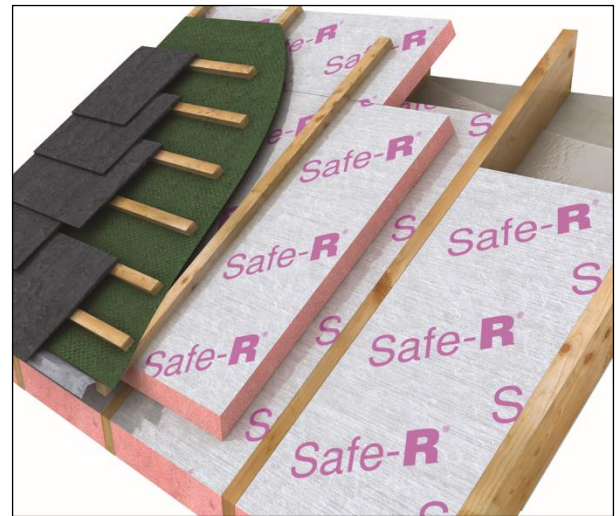
### XTRATHERM SAFE-R PITCHED ROOF BOARD

This Agrément Certificate Product Sheet<sup>(1)</sup> relates to Xtratherm Safe-R Pitched Roof Board, a rigid phenolic foam board with a composite foil-facing on both sides, for use in warm pitched roofs in new and existing domestic and non-domestic buildings. The product can also be used in dormer cheeks and dwarf wall applications of the 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 product has a declared thermal conductivity ( $\lambda_D$ ) of 0.020 W·m<sup>-1</sup>·K<sup>-1</sup> or 0.021 W·m<sup>-1</sup>·K<sup>-1</sup>, depending on the thickness range (see section 6).

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

**Behaviour in relation to fire** — the product has a reaction to fire classification of B-s1, d0 to BS EN 13501-1 : 2007 (see section 8).

**Durability** — the product is durable, rot proof and sufficiently stable to remain effective as insulation for the life of the building (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 Third issue: 12 May 2017

John Albon – Head of Approvals  
Construction Products

Originally certificated on 14 December 2010

Claire Curtis-Thomas  
Chief Executive

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](http://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, Xtratherm Safe-R Pitched Roof Board, 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)

<b>Requirement:</b>	<b>C2(c)</b>	<b>Resistance to moisture</b>
Comment:		The product can contribute to satisfying this Requirement. See sections 7.1 and 7.5 of this Certificate.
<b>Requirement:</b>	<b>L1(a)(i)</b>	<b>Conservation of fuel and power</b>
Comment:		The product can contribute to satisfying this Requirement. See section 6 of this Certificate.
<b>Regulation:</b>	<b>7</b>	<b>Materials and workmanship</b>
Comment:		The product is acceptable. See section 11 and the <i>Installation</i> part of this Certificate.
<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 consumption 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>
Comment:		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>
Comment:		The product is acceptable. See section 11 and the <i>Installation</i> part of this Certificate.
<b>Regulation:</b>	<b>9</b>	<b>Building standards applicable to construction</b>
Standard:	<b>3.15</b>	<b>Condensation</b>
Comment:		The product can contribute to a 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 sections 7.1 and 7.6 of this Certificate.
Standard:	<b>6.1(b)</b>	<b>Carbon dioxide emissions</b>
Standard:	<b>6.2</b>	<b>Building insulation envelope</b>
Comment:		The product can contribute to satisfying this Standard with reference to clauses, or parts of, 6.1.2 <sup>(2)</sup> , 6.1.6 <sup>(1)</sup> , 6.2.1 <sup>(1)(2)</sup> , 6.2.3 <sup>(1)</sup> , 6.2.4 <sup>(2)</sup> , 6.2.5 <sup>(2)</sup> , 6.2.6 <sup>(1)</sup> , 6.2.7 <sup>(1)</sup> , 6.2.8 <sup>(2)</sup> , 6.2.9 <sup>(1)(2)</sup> , 6.2.10 <sup>(1)</sup> , 6.2.11 <sup>(1)(2)</sup> , 6.2.12 <sup>(2)</sup> and 6.2.13 <sup>(1)(2)</sup> . See section 6 of this Certificate.
Standard:	<b>7.1(a)(b)</b>	<b>Statement of sustainability</b>
Comment:		The product can contribute to meeting 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 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)(2)</sup> [Aspects 1 <sup>(1)(2)</sup> and 2 <sup>(1)</sup> ], 7.1.6 <sup>(1)(2)</sup> [Aspects 1 <sup>(1)(2)</sup> and 2 <sup>(1)</sup> ] and 7.1.7 <sup>(1)(2)</sup> [Aspect 1 <sup>(1)(2)</sup> ]. See section 6 of this Certificate.

<b>Regulation:</b>	<b>12</b>	<b>Building standards applicable to conversions</b>
<b>Comment:</b>		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)

<b>Regulation:</b>	<b>23</b>	<b>Fitness of materials and workmanship</b>
<b>Comment:</b>		The product is acceptable. See section 11 and the <i>Installation</i> part of this Certificate.
<b>Regulation:</b>	<b>29</b>	<b>Condensation</b>
<b>Comment:</b>		The product can contribute to satisfying this Regulation. See section 7.1 of this Certificate.
<b>Regulation:</b>	<b>39(a)(i)</b>	<b>Conservation measures</b>
<b>Regulation:</b>	<b>40</b>	<b>Target carbon dioxide emission rate</b>
<b>Comment:</b>		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* (3.4) and 12 *General* (12.2 and 12.4) of this Certificate.

### Additional Information

#### NHBC Standards 2017

NHBC accepts the use of Xtratherm Safe-R Pitched Roof Board, provided it is installed, used and maintained 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 13166 : 2012. 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 Xtratherm Safe-R Pitched Roof Board is manufactured from closed-cell phenolic foam, faced with a composite foil-facing on both sides.

1.2 The boards have the nominal characteristics shown in Table 1.

*Table 1 Nominal characteristics*

<b>Characteristic (unit)</b>	<b>Value</b>
Length (mm)	2400
Width (mm)	1200
Thickness (mm)	50 to 120
Minimum compressive strength at 10% compression (kPa)	120
Edge profile	Plain

1.3 Ancillary items for use with the product are:

- vapour permeable roof tile underlay
- Helifix InSkew 600 or similar spiral fixings
- galvanized slab nails, ring-shank nails
- pre-treated counter battens and tiling laths
- roofing slates or tiles
- vapour control layer (VCL) and plasterboard.

## **2 Manufacture**

2.1 Raw materials are injected onto the lower foil-facer on a conveyor belt. The exothermic reaction expands the foam, which then comes into contact with the upper foil-facer. An automated process cures and cuts the product to the required size.

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.

2.3 The management system of Xtratherm UK Ltd has been assessed and registered as meeting the requirements of BS EN ISO 9001 : 2008 and BS EN ISO 14001 : 2004 by BRE Certification Ltd (Certificates 718 and EMS 718 respectively).

## **3 Delivery and site handling**

3.1 The product is delivered to site in polythene-wrapped packs. Each pack contains a label bearing the manufacturer's name, board dimensions and the BBA logo incorporating the number of this Certificate.

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

3.3 The product is light and easy to handle and care should be exercised to avoid crushing the edges or corners. If damaged, the product should be discarded.

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

## Assessment and Technical Investigations

The following is a summary of the assessment and technical investigations carried out on Xtratherm Safe-R Pitched Roof Board.

### Design Considerations

#### 4 Use

4.1 Xtratherm Safe-R Pitched Roof Board is for use as thermal insulation in new and existing pitched roofs of domestic and non-domestic buildings:

- above sloping rafters
- above and between sloping rafters
- between and below sloping rafters
- below horizontal ceiling joists (horizontal ceiling above a room-in-roof)
- between and/or to the inner face of studs in dwarf walls and dormer cheeks.

4.2 Roofs should be designed and constructed in accordance with the relevant clauses of BS 5250 : 2011, BS 5534 : 2014, BS 8212 : 1995 and BS EN 1995-1-1 : 2004.

4.3 For optimum thermal performance, the product should be installed with the correct orientation of its foil-facing (see section 12.3).

4.4 The product is not a structural component.

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

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

4.7 The provision of fire stops should be carried out in accordance with the requirements of the national Building Regulations.

4.8 A ventilated air space with a minimum depth of 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.

#### 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 the thermal transmittance (U value) should be carried out in accordance with BS EN ISO 6946 : 2007 and BRE Report BR 443 : 2006 using the declared thermal conductivity\* ( $\lambda_D$  values) shown in Table 2, and a foil surface emissivity ( $\varepsilon$ ) of 0.2. When considering insulation requirements, designers should refer to the detailed guidance contained in the documents supporting the national Building Regulations.

Table 2 Thermal conductivity

Insulation thickness (mm)	Thermal conductivity ( $W \cdot m^{-1} \cdot K^{-1}$ )
50 to 99	0.021
100 to 120	0.020

6.2 The U value of a completed roof will depend on the insulation thickness, the number and type of fixings, and the roof structure and its internal finish. Calculated U values for example constructions in accordance with the national Building Regulations are given in Table 3.

Table 3 U values<sup>(1)</sup>

U value ( $W \cdot m^{-2} \cdot K^{-1}$ )	Element type	Timber dimensions (mm)	Safe-R thickness <sup>(2)</sup> and location with respect to rafter/joist or stud		
			Inside	Inside	Inside
0.20	Existing sloping roof with ventilated space below underlay	50 x 100 at 400 centres	65	50	— <sup>(5)</sup>
0.18			75	50	— <sup>(5)</sup>
0.15			95	50	— <sup>(5)</sup>
0.20		50 x 150 at 400 centres	60	55	— <sup>(5)</sup>
0.18			60	70	— <sup>(5)</sup>
0.15			60	100	— <sup>(5)</sup>
0.18	New sloping roof with LR underlay	47 x 100 at 600 centres	50	75	— <sup>(5)</sup>
0.18			— <sup>(5)</sup>	65	50
0.16			— <sup>(5)</sup>	90	50
0.16		47 x 150 at 600 centres	50	95	— <sup>(5)</sup>
0.21			— <sup>(5)</sup>	120 <sup>(4)</sup>	— <sup>(5)</sup>
0.18			— <sup>(5)</sup>	65	50
0.13	Horizontal ceiling	47 x 100 at 400 centres	— <sup>(5)</sup>	115	50
0.16			80	— <sup>(3)</sup>	— <sup>(5)</sup>
0.13		35 x 100 at 600 centres	105	— <sup>(3)</sup>	— <sup>(5)</sup>
0.16			75	— <sup>(3)</sup>	— <sup>(5)</sup>
0.28	Dwarf wall or dormer cheek	38 x 89 at 600 centres	100	— <sup>(3)</sup>	— <sup>(5)</sup>
0.19			70	— <sup>(5)</sup>	— <sup>(5)</sup>
0.28		38 x 140 at 600 centres	50	80	— <sup>(5)</sup>
0.19			— <sup>(5)</sup>	115 <sup>(4)</sup>	— <sup>(5)</sup>
			50	80	— <sup>(5)</sup>

(1) Plasterboard taken as 12.5 mm at  $0.25 W \cdot m^{-1} \cdot k^{-1}$  and all timber % taken from BRE Report BR 443 : 2006.

(2) Nearest available thickness.

(3) 100 mm mineral wool at  $0.040 W \cdot m^{-1} \cdot k^{-1}$ .

(4) Includes a  $0.01 W \cdot m^{-2} \cdot k^{-1}$  gap correction.

(5) For improved thermal/carbon emission performance, additional batten/insulation thicknesses should be considered.

## Junctions



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 will adequately limit the risk of interstitial condensation when they are designed and constructed in accordance with BS 5250 : 2011, Annex H, and the relevant guidance.

7.2 For the purposes of assessing the risk of interstitial condensation, the insulation core vapour resistivity may be taken as approximately  $171 \text{ MN}\cdot\text{s}\cdot\text{g}^{-1}\cdot\text{m}^{-1}$ , with a resistance value of  $4.77 \text{ MN}\cdot\text{s}\cdot\text{g}^{-1}$  for each individual foil-facing.

7.3 Where the product is installed in a roof with either a horizontal or sloping ceiling (ie room-in-roof), a warm roof space is created and ventilation should be designed in accordance with BS 5250 : 2011, Annex H. However, any insulation in a horizontal ceiling should be removed.

7.4 Where high humidity may be expected, a VCL (such as 0.125 mm thick polythene with sealed and lapped joints) should also be used, unless a condensation risk analysis in accordance with BS 5250 : 2011 shows that it is not necessary.

### Surface condensation



7.5 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 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. Further guidance may be obtained from BRE Report BR 262 : 2002 and section 6.3 of this Certificate.

## 8 Behaviour in relation to fire

8.1 The product has a reaction to fire classification\* of B-s1, d0 to BS EN 13501-1 : 2007.

8.2 The product must not be carried over junctions between roofs and walls that are required to provide a minimum period of fire resistance. The continuity of fire resistance must be maintained, as described in the documents supporting the national Building Regulations.

8.3 When installed between or under the rafters, the insulation will be contained between the roof and internal lining board until one is destroyed. Therefore, the product will not contribute to the development stages of a fire or present a smoke or toxic hazard.

## 9 Strength and stability

### Over-rafter application only

9.1 The product, when installed in accordance with the manufacturer's instructions and this Certificate, will resist the loads likely to be met during installation and in service.

9.2 Resistance to wind uplift will depend largely on the building geometry and its geographical location and should be calculated in accordance with BS EN 1991-1-3 : 2003 and its UK National Annex. Snow loadings should be calculated in accordance with BS EN 1991-1-3 : 2003 and its UK National Annex.

9.3 When calculating the fixing spacing required to resist the calculated loadings, the requirements of BS EN 1995-1-1 : 2004 and its UK National Annex should be followed, where possible. Further guidance can be obtained from the Certificate holder. The Certificate holder and fixing manufacturer must advise on the use of the correct proprietary fixings and nails, and fixing capacity in accordance with BS EN 1995-1-1 : 2004 and its UK National Annex.

## 10 Maintenance

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

## 11 Durability



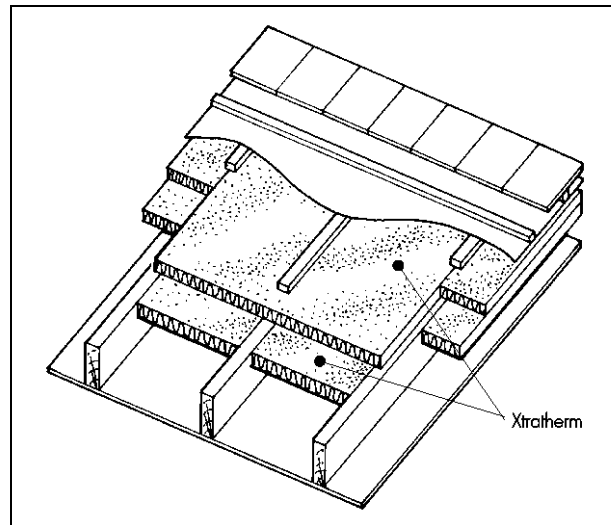
The product is durable, rot proof and sufficiently stable to remain effective as an insulation for the life of the building.

## Installation

### 12 General

12.1 Installation of Xtratherm Safe-R Pitched Roof Board (see Figure 1) must be in accordance with the relevant clauses of BS 5534 : 2014 and the manufacturer's instructions, and can be carried out in all conditions normal to roofing work.

Figure 1 Typical installation



12.2 The boards are light to handle but some handling difficulties may be experienced in windy conditions. Since the product will not support the weight of operatives, appropriate care must be taken during installation and tiling.

12.3 The product has printed logos applied to the outer foil-facing on one side only. To ensure optimum thermal performance, the boards must be installed with the unprinted foil-face always facing the cavity side.

12.4 The product can be cut easily using a sharp knife or fine tooth saw. Care must be taken to prevent damage, particularly to edges. Damaged boards should not be used. Small areas of damaged facing may be repaired with self-adhesive aluminium foil tape.

12.5 A tight fit must be ensured between the product and rafters, the product at the ridge, and at roof/wall junctions.

12.6 It is important to fill/seal gaps and joints in the insulation envelope, including at all service penetrations (see section 4.6).

12.7 Where the product is installed in traditional and timber-frame construction, cavity barriers at the junction of the external wall and roof space should be provided.

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

12.9 When applying roof tiles or slates to a warm roof construction, the recommendations of the manufacturer must be followed.

12.10 For installation of internal lining boards, see sections 13.21 and 13.22 of this Certificate.



## 13 Procedure

### Insulation over rafters

13.1 A treated timber stop batten, the same thickness as the insulation board, is fixed to the rafters close to the eaves to provide a firm fixing point for the counter battens. The product is laid over the rafters, commencing at the stop batten. The product should be tightly butted and positioned in a staggered pattern, with all the joints running from eaves to ridge occurring over the rafters. The procedure is continued until the whole area is covered.

13.2 Any gaps must be sealed with flexible sealant or expanding foam (outside the scope of this Certificate). Large-headed clout nails can be used as a temporary securing measure until the counter battens are secured into place.

13.3 A vapour-permeable (LR) roofing underlay should be installed on top of the insulation, and secured with counter battens (through the rafters), followed by tiling battens.

### Insulation between and above rafters

13.4 The product is cut to fit tightly within the space between the rafters, and can be restrained using proprietary clips or timber sections.

13.5 The product is installed flush with the top of the rafters.

13.6 A second layer of insulation board is then fixed above the rafters, installed as described in sections 13.1 to 13.3.

### Insulation between rafters

13.7 The product is cut to fit tightly within the space between the rafters and restrained using proprietary clips or timber battens, allowing sufficient depth for the insulation to sit flush with the underside of the rafters.

13.8 A ventilation gap of 50 mm must be maintained between the top of the insulation and roof tile underlay to minimise the risk of condensation, unless a vapour-permeable (LR) underlay is used.

13.9 When using a vapour-permeable (LR) roofing underlay on top of the rafters, the insulation can be installed full depth between the rafters, ie flush with the top and bottom of the rafters. Counter battens are then installed over the underlay, followed by tiling battens.

13.10 When using a high resistance (HR) roofing underlay on the top of the rafters, the insulation should be installed part depth between the rafters, ie flush with the bottom of the rafters, and set to create a 50 mm void between the top of the insulation and the top of the rafter for ventilation. Tiling battens are applied over the roofing underlay.

### Insulation between and below rafters

13.11 If required, after installation between rafters as described in section 13.4, a second layer of the product may be added below the rafters, running at right angles to the rafters and insulation fill, in a staggered pattern, and fixed accordingly.

13.12 The product should be butted tightly against each other to prevent gaps. Taping the joints with an acrylic adhesive foil tape provides an effective VCL and an air permeability barrier. To achieve an adequate bond, the product should be clean and free from any contamination.

### Horizontal ceiling above a room-in-roof — below joists only

13.13 Mineral wool is packed between the ceiling joists, flush with the upper surface of the ceiling joist.

13.14 The product is temporarily fixed to the underside of the timber joists.

13.15 The line of the timber joists is marked on the boards to allow fixing of the plasterboard lining.

### **Dwarf walls and dormer cheeks — between studs**

13.16 Timber stop battens or clips are fixed to the inner face of the studs, allowing sufficient depth for the insulation to sit flush with the inside of the studs. The product is cut to size and placed between the studs and held in place with clout nails.

### **Dwarf walls and dormer cheeks — between studs and lining**

13.17 Timber stop battens or clips are fixed to the inner face of the studs, allowing sufficient depth for the insulation to sit flush with the inside of the studs. The product is cut to size and placed between the studs and held in place with clout nails.

13.18 A second layer of the product is temporarily fixed to the inner face of the timber studding.

13.19 The line of the timber studs is marked on the boards to allow fixing of the plasterboard.

13.20 The product should be butted tightly against itself to prevent gaps. Taping the joints with an acrylic adhesive foil tape provides an effective VCL and an air permeability barrier. To achieve an adequate bond, the boards should be clean and free from any contamination.

### **Finishing**

13.21 Roof tiles or slates are installed in accordance with the relevant clauses of BS 5534 : 2014. When applying roof tiles or slates to a warm roof construction, the recommendations of the manufacturer should be followed.

13.22 A sealed polythene VCL, with a minimum thickness of 0.125 mm and lapped and sealed joints, is placed over the rafter, joist or stud face before applying the internal finishing plasterboard lining (to BS EN 520 : 2004); fixed in accordance with BS 8212 : 1995.

## **Technical Investigations**

### **14 Tests**

Tests were carried to determine:

- dimensional stability
- compressive strength
- short-term water absorption
- long-term water absorption by partial immersion
- thermal conductivity
- bowing under a thermal gradient.

### **15 Investigations**

15.1 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.

15.2 An assessment was made of the results of test data to BS EN 13166 : 2012 in relation to:

- dimensions
- squareness
- density
- $\lambda$  value.

15.3 An assessment of the risk of interstitial condensation was made.

15.4 An assessment was made of typical constructions which achieve the design U values.

## Bibliography

BS 5250 : 2011 + A1 : 2016 *Code of practice for control of condensation*

BS 5534 : 2014 + A1 : 2015 *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 + A1 : 2009 *Gypsum plasterboards — Definitions, requirements and test methods*

BS EN 1991-1-3 : 2003 + A1 : 2015 *Eurocode 1 — Actions on structures — General actions — Snow loads*

NA + A1 : 15 to BS EN 1991-1-3 : 2003 + A1 : 2015 *Eurocode 1 : Actions on structures — General actions — Snow loads*

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 + A1 : 2008 *Eurocode 5 : Design of timber structures — General — Common rules and rules for buildings*

BS EN 13166 : 2012 + A1 : 2016 *Thermal insulation products for buildings — Factory made phenolic foam (PF) products — Specification*

BS EN 13501-1 : 2007 + A1 : 2009 *Fire classification of construction products and building elements — Classification using test data from reaction to fire tests*

BS EN ISO 6946 : 2007 *Building components and building elements — Thermal resistance and thermal transmittance — Calculation method*

BS EN ISO 9001 : 2008 *Quality management systems — Requirements*

BS EN ISO 14001 : 2004 *Environmental management systems — Requirements*

BRE Report BR 262 : 2002 *Thermal insulation — avoiding risks*

BRE Report BR 443 : 2003 *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 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.