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Agrément Certificate

23/6884

Product Sheet 1 Issue 1

UNILIN SAFE-R INSULATION

UNILIN SAFE-R PITCHED ROOF BOARD (SR/PR)

This Agrément Certificate Product Sheet⁽¹⁾ relates to the Unilin Safe-R Pitched Roof Board (SR/PR), comprising a rigid phenolic foam (PF) board with a perforated composite foil facing on both sides, for use as insulation installed above, between and/or below rafters in tiled or slated timber pitched roofs, horizontal ceilings, dwarf walls and dormer cheeks of new or existing domestic and non-domestic buildings, with height restrictions in some cases.

(1) Hereinafter referred to as 'Certificate'.

The assessment includes

Product factors:

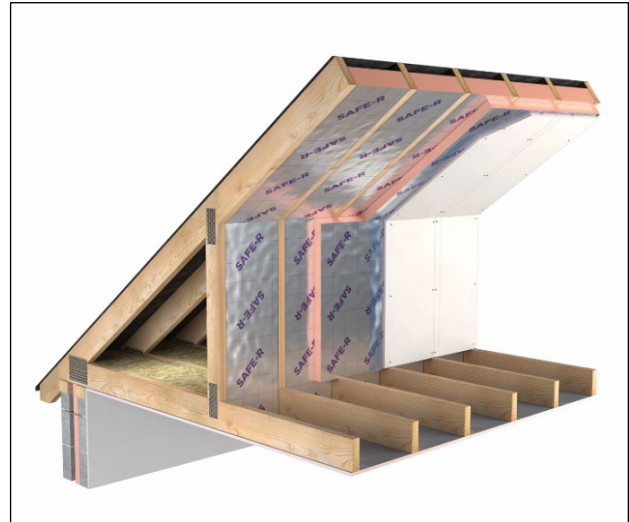
- compliance with Building Regulations
- compliance with additional regulatory or non-regulatory information where applicable
- evaluation against technical specifications
- assessment criteria and technical investigations
- uses and design considerations

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: 21 June 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 the Unilin Safe-R Pitched Roof Board (SR/PR), 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)

| | | |
|---------------------|-----------------|---|
| Requirement: | B3(4) | Internal fire spread (structure) |
| Comment: | | The product can contribute to satisfying this Requirement. See section 2 of this Certificate. |
| Requirement: | B4(1) | External fire spread |
| Comment: | | The product is restricted by this Requirement in some cases. See section 2 of this Certificate. |
| Requirement: | C2(c) | Resistance to moisture |
| Comment: | | The product can contribute to satisfying this Requirement. See section 3 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(1) | Materials and workmanship |
| Comment: | | The product is acceptable. See sections 8 and 9 of this Certificate. |
| Regulation: | 7(2) | Materials and workmanship |
| Comment: | | The product is restricted by this Regulation in some cases. See section 2 of this Certificate. |
| Regulation: | 25B | Nearly zero-energy requirements for new buildings |
| Regulation: | 26 | CO₂ emission rates for new buildings |
| Regulation: | 26A | Fabric energy efficiency rates for new dwellings (applicable to England only) |
| Regulation: | 26A | Primary energy rates for new buildings (applicable to Wales only) |
| Regulation: | 26B | Fabric performance values for new dwellings (applicable to Wales only) |
| Regulation: | 26C | Target primary energy rates for new buildings (applicable to England only) |
| Regulation: | 26C | Energy efficiency rating (applicable to Wales only) |
| Comment: | | The product can contribute to satisfying these Regulations. See section 6 of this Certificate. |



The Building (Scotland) Regulations 2004 (as amended)

| | | |
|--------------------|-------------|--|
| Regulation: | 8(1) | Fitness and durability of materials and workmanship |
| Comment: | | The product is acceptable. See sections 8 and 9 of this Certificate. |
| Regulation: | 8(3) | Fitness and durability of materials and workmanship |
| Comment: | | The product is restricted by this Regulation in some cases. See section 2 of this Certificate. |

| | | |
|--------------------|-----------|---|
| Regulation: | 9 | Building standards – construction |
| Standard: | 2.4 | Cavities |
| Comment: | | The product can contribute to satisfying this Standard, with reference to clauses 2.4.4 ⁽¹⁾ and 2.4.6 ⁽²⁾ . See section 2 of this Certificate. |
| Standard: | 2.6 | Spread to neighbouring buildings |
| Comment: | | The product is restricted by this Standard in some cases, with reference to clauses 2.6.5 ⁽¹⁾ and 2.6.6 ⁽²⁾ . See section 2 of this Certificate. |
| Standard: | 3.15 | Condensation |
| Comment: | | The product can contribute to satisfying this Standard, with reference to clauses 3.15.1 ⁽¹⁾⁽²⁾ , 3.15.3 ⁽¹⁾⁽²⁾ , 3.15.4 ⁽¹⁾⁽²⁾ , 3.15.5 ⁽¹⁾⁽²⁾ and 3.15.7 ⁽¹⁾⁽²⁾ . See section 3 of this Certificate. |
| Standard: | 6.1(b)(c) | Energy demand |
| Comment: | | The product can contribute to satisfying this Standard, with reference to clauses 6.1.1 ⁽¹⁾ and 6.1.2 ⁽²⁾ . See section 6 of this Certificate. |
| Standard: | 6.2 | Building insulation envelope |
| Comment: | | The product can contribute to satisfying this Standard, with reference to clauses, or parts of clauses, 6.2.1 ⁽¹⁾⁽²⁾ , 6.2.3 ⁽¹⁾ , 6.2.4 ⁽²⁾ , 6.2.6 ⁽¹⁾ , 6.2.7 ⁽¹⁾⁽²⁾ , 6.2.8 ⁽¹⁾⁽²⁾ , 6.2.9 ⁽¹⁾⁽²⁾ , 6.2.10 ⁽¹⁾⁽²⁾ , 6.2.11 ⁽²⁾ and 6.2.12 ⁽¹⁾ . 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. 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 ⁽¹⁾ , 7.1.6 ⁽¹⁾⁽²⁾ , 7.1.7 ⁽¹⁾ , 7.1.9 ⁽²⁾ and 7.1.10 ⁽²⁾ . See section 6 of this Certificate. |
| Regulation: | 12 | Building standards – conversion |
| Comment: | | All 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 ⁽¹⁾⁽²⁾ and Schedule 6 ⁽¹⁾⁽²⁾ . |
| | | (1) Technical Handbook (Domestic). (2) Technical Handbook (Non-Domestic). |



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

| | | |
|--------------------|------------------------|--|
| Regulation: | 23(1)(a)(i) | Fitness of materials and workmanship |
| Comment: | (iii)(b)(i)(ii) | The product is acceptable. See sections 8 and 9 of this Certificate. |
| Regulation: | 23(2) | Fitness of materials and workmanship |
| Comment: | | The product is restricted by this Regulation in some cases. See section 2 of this Certificate. |
| Regulation: | 29 | Condensation |
| Comment: | | The product can contribute to satisfying this Regulation. See section 3 of this Certificate. |
| Regulation: | 35(4) | Internal fire spread – structure |
| Comment: | | The product can contribute to satisfying this Regulation. See section 2 of this Certificate. |
| Regulation: | 36(a) | External fire spread |
| Comment: | | The product is restricted by this Regulation in some cases. See section 2 of this Certificate. |

| | | |
|--------------------|-----------------|--|
| Regulation: | 39(a)(i) | Conservation measures |
| Comment: | | The product can contribute to satisfying this Regulation. See section 6 of this Certificate. |
| Regulation: | 40(2) | Target carbon dioxide emission rate |
| Regulation: | 43(1)(2) | Renovation of thermal elements |
| Regulation: | 43B | Nearly zero-energy requirements for new buildings |
| 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, the Unilin Safe-R Pitched Roof Board (SR/PR), 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 the Unilin Safe-R Pitched Roof Board (SR/PR) to be satisfactory for use as described in this Certificate. The product has been assessed for use as insulation installed above, between and/or below rafters in tiled or slated timber pitched roofs, horizontal ceilings, dwarf walls and dormer cheeks of new or existing domestic and non-domestic buildings, with height restrictions in some cases.

ASSESSMENT

Product description and intended use

The Certificate holder provided the following description for the product under assessment. The Unilin Safe-R Pitched Roof Board (SR/PR) consists of a closed-cell rigid phenolic (PF) foam board with a perforated composite foil facing on both sides.

The product has the nominal characteristics given in Table 1.

Table 1 Nominal characteristics of Unilin Safe-R Pitched Roof Board (SR/PR)

| Characteristic (unit) | Value |
|-----------------------|-----------|
| Length (mm) | 2400 |
| Width (mm) | 1200 |
| Thickness (mm) | 50 to 150 |
| Edge profile | Square |

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:

- tile or slate roof finish
- roof tile underlay
- treated timber battens/rafters
- air and vapour control layer (AVCL)
- fixings
- proprietary airtightness tape
- gypsum plasterboard lining.

Applications

The product is intended for use as insulation in the following applications, in new and existing domestic or non-domestic buildings, on tiled or slated pitched roofs, with height restrictions in some cases (see section 2 of this Certificate):

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

Product assessment – key factors

The product was assessed for the following key factors, and the outcome of the assessments 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 |
|--|-------------------|----------------|---------|
| Unilin Safe-R Pitched Roof Board (SR/PR) | BS EN 826 : 1996 | Value achieved | 100 kPa |

2 Safety in case of fire

Data were assessed for the following characteristic.

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 |
|--|----------------------|----------------|----------|
| Unilin Safe-R Pitched Roof Board (SR/PR) | NF EN 13501-1 : 2013 | Value achieved | C-s1, d0 |

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 In England, the product, when used in roof pitches greater than 70°, must not be used on residential buildings with a storey 11 m or more in height, or on any other building with a storey 18 m or more in height.

2.1.4 In Wales and Northern Ireland, the product, when used in roof pitches greater than 70°, must not be used on buildings with a storey 18 m or more in height.

2.1.5 In Scotland, the product, when used in roof pitches greater than 70°, must not be used less than 1 m from a relevant boundary or on buildings that have a storey 11 m or more above ground level.

2.1.6 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 wall construction.

3 Hygiene, health and the environment

Data were assessed for the following characteristics.

3.1 Water vapour permeability

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

| Product assessed | Assessment method | Requirement | Result |
|----------------------------------|----------------------------|----------------|---|
| Phenolic foam insulation | BS EN 12086 : 1997 | Value achieved | 171 MN·s·g ⁻¹ ·m ⁻¹ |
| Composite foil facing perforated | PN EN 12086 : 2001 (Set C) | | 4.77 MN·s·g ⁻¹ |

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

4 Safety and accessibility in use

Not applicable.

5 Protection against noise

Not applicable.

6 Energy economy and heat retention

6.1 Thermal conductivity

The product was tested for thermal conductivity and the results are given in Table 5.

| Product assessed | Insulation thickness | Assessment method | Requirement | Result |
|--|------------------------------|--------------------|----------------------------------|--|
| Unilin Safe-R Pitched Roof Board (SR/PR) | 50 to 99 mm 100 to 150 mm | BS EN 13166 : 2012 | Declared value (λ _D) | 0.021 W·m ⁻¹ ·K ⁻¹ 0.020 W·m ⁻¹ ·K ⁻¹ |

6.2 Thermal performance

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

| Product assessed | Assessment method | Requirement | Result |
|-----------------------|--------------------|----------------|--------|
| Unprinted foil facing | BS EN 16012 : 2012 | Declared value | 0.05 |

6.3 Conservation of fuel and power

6.3.1 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. Example U values are given in Tables 7 to 10.

Table 7 Example U values — pitched roof

| Target U value (W·m ⁻² ·K ⁻¹) | Unilin Safe-R Pitched Roof Board (SR/PR) insulation thickness (mm) | | |
|---|---|---|--|
| | Over rafters ⁽¹⁾ | Between and over rafters ⁽²⁾ | Between and under rafters ⁽³⁾ |
| 0.09 | – ⁽⁵⁾ | 115 + 115 | 135 + 135 ⁽⁴⁾ |
| 0.11 | – ⁽⁵⁾ | 100 + 95 | 115 + 110 ⁽⁴⁾ |
| 0.12 | – ⁽⁵⁾ | 95 + 85 | 105 + 100 |
| 0.13 | 145 | 85 + 80 | 100 + 95 |
| 0.15 | 125 | 70 + 70 | 85 + 85 |
| 0.16 | 115 | 65 + 65 | 80 + 80 |
| 0.18 | 100 | 60 + 55 | 75 + 70 |
| 0.20 | 95 | 50 + 50 | 65 + 65 |
| 0.25 | 75 | 50 + 50 | 55 + 50 |

- (1) Pitched roof construction — concrete tiles on 25 mm timber tile battens (well-ventilated) on low-resistance (LR) breather membrane; SR/PR insulation secured with 11 fixings per m² – stainless steel ($\lambda = 17 \text{ W}\cdot\text{m}^{-1}\cdot\text{K}^{-1}$) with a cross-sectional area of 9 mm², on 47 by 150 mm timber rafters (11.75%; $\lambda = 0.13 \text{ W}\cdot\text{m}^{-1}\cdot\text{K}^{-1}$) with a low-e ($\epsilon = 0.05$) air cavity between the timbers; AVCL; and 15 mm plasterboard ($\lambda = 0.25 \text{ W}\cdot\text{m}^{-1}\cdot\text{K}^{-1}$).
- (2) Pitched roof construction — concrete tiles on 25 mm timber tile battens (well-ventilated) on low-resistance (LR) breather membrane; SR/PR insulation secured with 11 fixings per m² – stainless steel ($\lambda = 17 \text{ W}\cdot\text{m}^{-1}\cdot\text{K}^{-1}$) with a cross-sectional area of 9 mm², above SR/PR insulation fitted tightly between the 47 by 150 mm timber rafters (11.75%; $\lambda = 0.13 \text{ W}\cdot\text{m}^{-1}\cdot\text{K}^{-1}$) with a residual low-e ($\epsilon = 0.05$) air cavity between the timbers; AVCL; and 15 mm plasterboard ($\lambda = 0.25 \text{ W}\cdot\text{m}^{-1}\cdot\text{K}^{-1}$).
- (3) Pitched roof construction — concrete tiles on 25 mm timber tile battens (well-ventilated) on sarking felt; 50 mm well-ventilated cavity above SR/PR insulation fitted tightly between the 47 by 150 mm timber rafters (11.75%; $\lambda = 0.13 \text{ W}\cdot\text{m}^{-1}\cdot\text{K}^{-1}$); SR/PR insulation below rafters secured with 14.58 fixings per m² – mild steel ($\lambda = 50 \text{ W}\cdot\text{m}^{-1}\cdot\text{K}^{-1}$) with a cross-sectional area of 10.46 mm²; AVCL; and 15 mm plasterboard ($\lambda = 0.25 \text{ W}\cdot\text{m}^{-1}\cdot\text{K}^{-1}$).
- (4) With additional timber battens ($\lambda = 0.13 \text{ W}\cdot\text{m}^{-1}\cdot\text{K}^{-1}$) added beneath the 150 mm rafters, to maintain a 50 mm ventilated cavity above the insulation.
- (5) Can be achieved with the systems ‘between and over rafters’ and ‘between and under rafters’.

Table 8 Example U values — horizontal ceiling⁽¹⁾

| Target U value (W·m ⁻² ·K ⁻¹) | Unilin Safe-R Pitched Roof Board (SR/PR) insulation thickness (mm) |
|---|---|
| 0.09 | 145 |
| 0.11 | 110 |
| 0.12 | 100 |
| 0.13 | 90 |
| 0.15 | 70 |
| 0.16 | 60 |
| 0.18 | 50 |
| 0.20 | 50 |
| 0.25 | 50 |

- (1) Cold pitched roof construction — uninsulated tiled roof with a felt underlay ($R = 0.2 \text{ m}^2\cdot\text{K}\cdot\text{W}^{-1}$); 140 mm horizontal timber joists ($\lambda = 0.13 \text{ W}\cdot\text{m}^{-1}\cdot\text{K}^{-1}$, 13% fraction) fully filled with mineral wool insulation ($\lambda = 0.044 \text{ W}\cdot\text{m}^{-1}\cdot\text{K}^{-1}$); SR/PR insulation secured with 4.4 fixings per m² – stainless steel ($\lambda = 17 \text{ W}\cdot\text{m}^{-1}\cdot\text{K}^{-1}$) with a cross-sectional area of 6.6 mm²; AVCL; and 15 mm plasterboard ($\lambda = 0.25 \text{ W}\cdot\text{m}^{-1}\cdot\text{K}^{-1}$).

Table 9 Example U values — dwarf wall⁽¹⁾

| Target U value (W·m ⁻² ·K ⁻¹) | Unilin Safe-R Pitched Roof Board (SR/PR) insulation thickness – lining (mm) |
|---|--|
| 0.13 | 80 |
| 0.15 | 60 |
| 0.17 | 50 |
| 0.18 | 50 |
| 0.21 | 50 |
| 0.26 | 50 |
| 0.28 | 50 |
| 0.30 | 0 ⁽²⁾ |

(1) Dwarf wall construction — uninsulated tiled roof with a felt underlay ($R = 0.2 \text{ m}^2 \cdot \text{K} \cdot \text{W}^{-1}$); 100 mm timber frame ($\lambda = 0.13 \text{ W} \cdot \text{m}^{-1} \cdot \text{K}^{-1}$, 15% fraction) fully filled with SR/PR insulation; SR/PR insulation as lining secured with 4.4 fixings per m² – stainless steel ($\lambda = 17 \text{ W} \cdot \text{m}^{-1} \cdot \text{K}^{-1}$) with a cross-sectional area of 6.6 mm²; AVCL; and 15 mm plasterboard ($\lambda = 0.25 \text{ W} \cdot \text{m}^{-1} \cdot \text{K}^{-1}$).

(2) Can be achieved without SR/PR as lining.

Table 10 Example U values — dormer cheek⁽¹⁾

| Target U value (W·m ⁻² ·K ⁻¹) | Unilin Safe-R Pitched Roof Board (SR/PR) insulation thickness – lining (mm) |
|---|--|
| 0.13 | 80 |
| 0.15 | 60 |
| 0.17 | 50 |
| 0.18 | 50 |
| 0.21 | 50 |
| 0.26 | 50 |
| 0.28 | 50 |
| 0.30 | 0 ⁽²⁾ |

(1) Dormer cheek construction — 10 mm tile cladding; 25 mm well-ventilated cavity; breather membrane; 9 mm timber oriented strand board (OSB) sheathing board ($\lambda = 0.13 \text{ W} \cdot \text{m}^{-1} \cdot \text{K}^{-1}$); 100 mm timber frame ($\lambda = 0.13 \text{ W} \cdot \text{m}^{-1} \cdot \text{K}^{-1}$, 15% fraction) fully filled with SR/PR insulation; SR/PR insulation as lining secured with 4.4 fixings per m² – stainless steel ($\lambda = 17 \text{ W} \cdot \text{m}^{-1} \cdot \text{K}^{-1}$) with a cross-sectional area of 6.6 mm²; AVCL; and 15 mm plasterboard ($\lambda = 0.25 \text{ W} \cdot \text{m}^{-1} \cdot \text{K}^{-1}$).

(2) Can be achieved without SR/PR as lining.

6.3.2 On the basis of data assessed, 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 this product were assessed.

8.2 The product was tested for dimensional stability and the results are given in Table 11.

Table 11 Dimensional stability

| Product assessed | Assessment method | Requirement | Result |
|--|---|----------------|-----------|
| Unilin Safe-R Pitched Roof Board (SR/PR) | Dimensional stability to BS EN 1604 : 1996 (70°C and 90% RH for 48 hours) | Declared value | DS(70,90) |
| | Dimensional stability to BS EN 1604 : 1996 (-20°C for 48 hours) | | DS(-20,-) |

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, BS 5534 : 2014, BS 8212 : 1995 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 suitable experienced and competent individual in accordance with BS EN 1991-1-4 : 2005 and its UK National Annex. Snow loadings must be calculated in accordance with 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 25 mm may be required between the underside of the roof tile underlay (at the lowest point of the maximum allowable 15 mm drape) and the upper face of the insulation board, 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 wall or 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 (low resistance - 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 a high resistance (HR) underlay, the space below it must be ventilated in accordance with BS 5250 : 2021 with a minimum 25 mm air gap between the top of the insulation board and the lowest point of the maximum allowable 15 mm roof underlay drape.

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 should be removed.

9.1.13 Where high humidity may be expected, an air and vapour control layer (AVCL) 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 boards are not subjected to any construction or foot traffic loads. Roof timbers of adequate strength must be used to support such loads.

9.2.4 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.

9.3 Workmanship

Practicability of installation was assessed by the BBA, 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 the 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 product name and characteristics, Certificate holder's name, batch number, year of manufacture 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 must 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 The product must not be exposed to open flame or other ignition sources, or to solvents or other chemicals.

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.

CE marking

The Certificate holder has taken the responsibility of CE marking the product in accordance with harmonised European Standard EN 13166 : 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, BS EN ISO 14001 : 2015 and BS ISO 45001 : 2018 by BRE Global Ltd (Certificates 718 QMS, 718 EMS and 718 HS respectively).

Additional information on installation

Installation must be in accordance with the Certificate holder's instructions and this Certificate.

A.1 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.

A.2 The product can be cut easily using a sharp knife or fine-toothed 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.

A.3 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 should be cut to achieve tightly butted joints.

A.4 It is important to fill/seal gaps and joints in the insulation envelope, including at all service penetrations. See section 9.1.6 of this Certificate.

A.5 Where the product is installed in traditional and timber-frame construction, cavity barriers should be provided at the junction of the external wall and roof space.

A.6 Roof tiles or slates are installed in accordance with the relevant clauses of BS 5534 : 2014.

A.7 When applying roof tiles or slates to a warm roof construction, the recommendations of the manufacturer must be followed.

A.8 For installation of internal lining boards, see sections A.29 and A.30 of this Certificate.

Procedure

Insulation above rafters

A.9 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.

A.10 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.

A.11 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

A.12 The product is cut to fit tightly within the space between the rafters, and can be restrained using proprietary clips or timber sections.

A.13 The product is installed flush with the top of the rafters.

A.14 A second layer of insulation board is then fixed above the rafters, installed as described in sections A.9 to A.11.

Insulation between rafters

A.15 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.

A.16 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.

A.17 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.

A.18 When using a high resistance (HR) roofing underlay on 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

A.19 If required, after installation as described in section A.12, a second layer of the product may be added below the rafters running transverse to the first, to provide a staggered layer, and secured accordingly.

A.20 The product should be butted tightly against itself to prevent gaps. Taping the joints with an acrylic adhesive foil tape provides an effective AVCL 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 the roof — below joists only

A.21 Mineral wool insulation is packed between the ceiling joists, flush with the upper surface of the ceiling joist.

A.22 The product is temporarily fixed to the underside of the timber joists.

A.23 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

A.24 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

A.25 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.

A.26 A second layer of the product is temporarily fixed with clout nails to the inner face of the timber studding.

A.27 The line of the timber studs is marked on the boards to allow fixing of plasterboard.

A.28 The product should be butted tightly against itself to prevent gaps. Taping the joints with an acrylic adhesive foil tape provides an effective AVCL and an air permeability barrier. To achieve an adequate bond, the boards should be clean and free from any contamination.

Finishing

A.29 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.

A.30 A sealed polyethylene AVCL, with a minimum thickness of 0.125 mm and with lapped and sealed joints, is placed over the rafter, joist or stud face, before the internal finishing plasterboard lining to BS EN 520 : 2004. The AVCL is fixed in accordance with BS 8212 : 1995.

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 *Code of practice for slating and tiling (including shingles)*
- 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 826 : 1996 *Thermal insulating products for building applications — Determination of compression behaviour*
- BS EN 1604 : 1996 *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 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 + A1 : 2008 *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 13166 : 2012 + A2 : 2016 *Thermal insulation products for buildings — Factory made phenolic foam (PF) products — Specification*
- BS EN 16012 : 2012 + A1 : 2015 *Thermal insulation for buildings — Reflective insulation products — Determination of the declared thermal performance*
- 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*
- BS ISO 45001 : 2018 *Occupational health and safety management systems — Requirements with guidance for use*
- NF EN 13501-1 : 2013 *Fire classification of construction products and building elements — Classification using data from reaction to fire tests*
- PN EN 12086 : 2001 *Thermal insulating products for building applications — Determination of water vapour transmission properties*

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.