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Agrément Certificate
23/6874
Product Sheet 1 Issue 1

UNILIN XTROLINER (XO)

UNILIN XTROLINER PITCHED ROOF INSULATION (XO/PR)

This Agrément Certificate Product Sheet(1) relates to Unilin XtroLiner Pitched Roof Insulation (XO/PR), comprising rigid polyisocyanurate (PIR) foam boards with a textured aluminium-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: 25 September 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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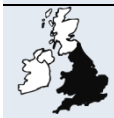
SUMMARY OF ASSESSMENT AND COMPLIANCE

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 Unilin XtroLiner Pitched Roof Insulation (XO/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 is restricted this Requirement. See section 2 of this Certificate.
Requirement:	**B4(1)**	**External fire spread**
Comment:		The use of 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; however, compensating fabric measures may be required. 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**	**CO_2 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; however, compensating fabric/service measures may be required. 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:		Use of the product is restricted by 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 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); however, compensating fabric/service measures may be required. 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); however, compensating fabric measures may be required. 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:		Comments 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)(iii) (b)(i)(ii)**	**Fitness of materials and workmanship**
Comment:		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 is restricted by 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; however, compensating fabric measures may be required. See section 6 of this Certificate.
Regulation:	**40(2)**	**Target carbon dioxide emission rate**
Regulation:	**43(1)(2)**	**Renovation of thermal elements**
Regulation:	**43(b)**	**Nearly zero-energy requirements for new buildings**
Comment:		The product can contribute to satisfying these Regulations; however, compensating fabric/service measures may be required. See section 6 of this Certificate.

Additional Information

NHBC Standards 2024

In the opinion of the BBA, Unilin XtroLiner Pitched Roof Insulation (XO/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 Unilin XtroLiner Pitched Roof Insulation (XO/PR) to be satisfactory for use as described in this Certificate. The product has been assessed 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. Unilin XtroLiner Pitched Roof Insulation (XO/PR) comprises rigid PIR foam, faced with a textured aluminium-foil-facing on both sides.

The product has the nominal characteristics given in Table 1.

Table 1 Nominal characteristics

Characteristic (unit)	Value
Length (mm)	2400
Width (mm)	1200
Thickness (mm)	25, 30, 40, 50, 60, 70, 75, 80, 100 and 120
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.

Application

The product is for use as insulation in the following applications, on 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 characteristics.

1.1 Behaviour under loading

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

Table 2 Compressive strength

Product assessed	Assessment method	Requirement	Result
Unilin XtroLiner Pitched Roof Insulation (XO/PR)	PN EN 826 : 1998	Value achieved	150 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(1)
Unilin XtroLiner Pitched Roof Insulation (XO/PR)	NF EN 13501-1 : 2018	Value achieved	C-s2, d0

(1) Test report DO-19-1319\A-R1-AMDT1 (Issue No. 1, dated 21 October 2019), issued by CREPIM, available from the Certificate holder on request.

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 resistance to water vapour diffusion was assessed and the results are given in Table 4.

Table 4 Water vapour resistivity/resistance

Product assessed	Assessment method	Requirement	Result
PIR insulation	BS EN ISO 10456 : 2007	Value achieved	300 $MN \cdot s \cdot g^{-1} \cdot m^{-1}$
Foil facing	BS 5250 : 2021		1000 $MN \cdot s \cdot g^{-1}$

3.1.2 For the purposes of assessing the risk of interstitial condensation, the water vapour resistance/resistivity 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

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
Unilin XtroLiner Pitched Roof Insulation (XO/PR)	BS EN 13165 : 2012	Declared value (λ_D)	0.021 $W \cdot m^{-1} \cdot K^{-1}$

6.2 Thermal performance

The 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
Foil facing	BS EN 16012 : 2012	Value achieved	0.11

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 ($W \cdot m^{-2} \cdot K^{-1}$)	Unilin XtroLiner Pitched Roof Insulation (XO/PR) thickness (mm)		
	Over rafters[1]	Between and over rafters[2]	Between and under rafters[3]
0.09	—[5]	120 + 120	—[5]
0.11	—[5]	120 + 100	120[4] + 120
0.12	—[5]	120 + 70	120[4] + 100
0.13	—[5]	120 + 60	100 + 100
0.15	—[5]	100 + 50	100 + 75
0.16	120	100 + 50	100 + 70
0.18	120	100 + 30	100 + 50
0.20	100	100 + 25	100 + 40
0.25	75	60 + 25	100 + 25

(1) Pitched roof construction — concrete tiles on 25 mm timber tile battens (well-ventilated) on LR breather membrane; XO/PR insulation secured with 11 fixings per m^2 – stainless steel (λ = 17 $W \cdot m^{-1} \cdot K^{-1}$) with a cross-sectional area of 9 mm^2, on 47 by 150 mm timber rafters (11.75%; λ = 0.13 $W \cdot m^{-1} \cdot K^{-1}$) with a low-e ($\varepsilon_D$ = 0.1) air cavity between the timbers; AVCL; and 15 mm plasterboard (λ = 0.25 $W \cdot m^{-1} \cdot K^{-1}$).

(2) Pitched roof construction — concrete tiles on 25 mm timber tile battens (well-ventilated) on LR breather membrane; XO/PR insulation secured with 11 fixings per m^2 – stainless steel (λ = 17 $W \cdot m^{-1} \cdot K^{-1}$) with a cross-sectional area of 9 mm^2, above XO/PR insulation fitted tightly between the 47 by 150 mm timber rafters (11.75%; λ = 0.13 $W \cdot m^{-1} \cdot K^{-1}$) and a residual low-e ($\varepsilon_D$ = 0.1) air cavity between the timbers; AVCL and 15 mm plasterboard (λ = 0.25 $W \cdot m^{-1} \cdot K^{-1}$).

(3) Pitched roof construction — concrete tiles on 25 mm timber tile battens (well ventilated) on LR breather membrane; 50 mm clear well-ventilated cavity above XO/PR insulation fitted tightly between the 47 by 150 mm timber rafters (11.75%; λ = 0.13 $W \cdot m^{-1} \cdot K^{-1}$); XO/PR insulation below rafters, AVCL, and 15 mm plasterboard (λ = 0.25 $W \cdot m^{-1} \cdot K^{-1}$) all secured with 14.58 fixings per m^2 – mild steel (λ = 50 $W \cdot m^{-1} \cdot K^{-1}$) with a cross-sectional area of 10.46 mm^2.

(4) With additional timber battens (λ = 0.13 $W \cdot m^{-1} \cdot K^{-1}$) added beneath the 150 mm rafters, to maintain a 50 mm ventilated cavity above the insulation.

(5) See section 6.3.4.

Table 8 Example U values — horizontal ceiling[1][2]

Target U value ($W \cdot m^{-2} \cdot K^{-1}$)	Unilin XtroLiner Pitched Roof Insulation (XO/PR) thickness (mm)
0.09	—[3]
0.11	120
0.12	100
0.13	100
0.15	70
0.16	60
0.18	50
0.20	40
0.25	25

(1) Cold pitched roof construction — uninsulated tiled roof with a felt underlay (R = 0.2 $m^2 \cdot K \cdot W^{-1}$); 140 mm horizontal timber joists (λ = 0.13 $W \cdot m^{-1} \cdot K^{-1}$, 13% fraction) fully filled with mineral wool insulation (λ = 0.044 $W \cdot m^{-1} \cdot K^{-1}$); XO/PR insulation; AVCL; and 15 mm plasterboard (λ = 0.25 $W \cdot m^{-1} \cdot K^{-1}$).

(2) Calculations based upon 4.4 stainless steel fixings per m^2 (6.6 mm^2 cross-sectional area, λ = 17 $W \cdot m^{-1} \cdot K^{-1}$).

(3) See section 6.3.4.

Table 9 Example U values — dwarf wall[1][2]

Target U value ($W \cdot m^{-2} \cdot K^{-1}$)	Unilin XtroLiner Pitched Roof Insulation (XO/PR) thickness – lining (mm)
0.13	80
0.15	70
0.17	50
0.18	40
0.21	25
0.26	25
0.28	25
0.30	25

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

Table 10 Example U values — dormer cheek[1][2]

Target U value ($W \cdot m^{-2} \cdot K^{-1}$)	Unilin XtroLiner Pitched Roof Insulation (XO/PR) thickness – lining (mm)
0.13	80
0.15	70
0.17	50
0.18	40
0.21	25
0.26	25
0.28	25
0.30	25

(1) Dormer cheek construction — 10 mm tile cladding; fully ventilated 25 mm clear cavity; breather membrane; 9 mm timber oriented strand board (OSB) sheathing board (λ = 0.13 $W \cdot m^{-1} \cdot K^{-1}$); 100 mm timber frame (λ = 0.13 $W \cdot m^{-1} \cdot K^{-1}$, 15% fraction) fully filled with XO/PR insulation; XO/PR insulation as lining; AVCL; and 15 mm plasterboard (λ = 0.25 $W \cdot m^{-1} \cdot K^{-1}$).
(2) Calculations based upon 4.4 stainless steel fixings per m^2 (6.6 mm^2 cross-sectional area, λ = 17 $W \cdot m^{-1} \cdot K^{-1}$).

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

6.3.3 For improved energy or carbon savings, designers must consider appropriate compensating fabric/service measures.

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 11.

Table 11 Dimensional stability

Product assessed	Assessment method	Requirement	Result
Unilin XtroLiner Pitched Roof Insulation (XO/PR)	Dimensional stability to BS EN 1604 : 1997 (70°C and 90% RH for 48 hours)	Declared value	DS(70,90)4
	Dimensional stability to BS EN 1604 : 1997 (-20°C for 48 hours)		DS(-20,-)2

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.

9.1.1.1 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.

9.1.1.2 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.

9.1.1.3 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 UK National Annex must be followed.

9.1.1.4 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.

9.1.1.5 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.

9.1.1.6 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 9.1.10).

9.1.1.7 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.

9.1.1.8 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

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

9.1.1.10 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 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.

9.1.1.11 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 should be designed in accordance with BS 5250 : 2021. However, any insulation in a horizontal ceiling should be removed.

9.1.1.12 Where high humidity may be expected, an 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

9.1.1.13 In England and Wales, roofs will adequately limit the risk of surface condensation when the thermal transmittance (U value) does not exceed 0.35 $W \cdot m^{-2} \cdot K^{-1}$ at any point, and the junctions with walls are designed in accordance with section 9.1.8 of this Certificate.

9.1.1.14 In Scotland, roofs will adequately limit the risk of surface condensation when the thermal transmittance (U value) does not exceed 1.2 $W \cdot m^{-2} \cdot K^{-1}$ at any point. Guidance may be obtained from BS 5250 : 2021. Further guidance may be obtained from BRE Report BR 262 : 2002 and section 9.1.8 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.

9.3 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 products 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 in polythene-wrapped packs. Each pack contains a label with the Certificate holder's name, board dimensions and the BBA logo incorporating the number of this Certificate.

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

11.2.1 The product must be stored such that it is raised off the ground, inside or under cover on a flat, dry, level surface in a well-ventilated area. The product must be protected from rain, snow, and prolonged exposure to sunlight. Boards that have been allowed to get wet or damaged must not be used. Nothing must be stored on top of the boards.

11.2.2 The product must not be exposed to naked flame or other ignition sources. Care must be taken to avoid contact with solvents and with materials containing volatile organic compounds. If damaged, the product must be discarded.

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.

CE marking

The Certificate holder has taken the responsibility of CE marking the product, in accordance with harmonised European 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 ISO 9001 : 2015, ISO 14001 : 2015 and ISO 45001 : 2018 by BRE (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 summary of the procedure is provided below:

A.1 The boards can be cut to size using a sharp knife or a fine-toothed saw.

A.2 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.3 It is important to fill/seal gaps and joints in the insulation envelope, including at all service penetrations. See section 9.1.5.

Insulation above rafters

A.4 A preservative-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.5 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.6 Counter battens, underlay, and tiling battens should be installed in accordance with conventional good practice.

Insulation between and above rafters

A.7 The product is cut to size and placed between the rafters on timber batten carriers or sarking clips, which are fixed with nails. The upper face of the product must be kept flush with the top of the rafter. The second layer is placed over the rafters as described in sections A.4 to A.6.

Insulation between rafters

A.8 Following completion of the roof cladding, the product is cut to size and placed between the rafters. Timber battens or clips are fixed to the inner face of the rafters, allowing sufficient depth for the insulation to sit flush with the underside of the rafters.

A.9 A sealed polythene AVCL, with a minimum thickness of 125 μm and with lapped and sealed joints, is placed over the rafter face before applying the internal finish.

Insulation between and below rafters

A.10 If required, after installation as described in section A.8, 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.11 The product should be butted tightly against itself to prevent gaps, and joints taped.

A.12 The insulation is sealed at all service penetrations.

Horizontal ceiling above a room in the roof — below joists only

A.13 Mineral wool insulation is packed between the ceiling joists, flush with the upper surface of the ceiling joist.

A.14 The product is temporarily fixed to the underside of the timber joists.

A.15 The line of the timber joists is marked on the boards to allow fixing of plasterboard.

External finishing — warm roofs

A.16 A vapour-permeable roof tile underlay is laid in accordance with the manufacturer's instructions.

A.17 Preservative-treated counter battens (minimum 38 mm deep) are fixed at each rafter run from eaves to ridge using proprietary fixings at required centres in accordance with the fixing manufacturer's instructions. The counter batten is also fixed to the anchor batten, with short lengths being tightly butted together.

A.18 Tiling laths are fixed horizontally at spacings to suit the specified tiles or slates, with the nails penetrating the full depth of the laths and counter batten.

Internal finishing

A.19 The AVCL and plasterboard are fixed over the product and secured with conventional nails or screws to the appropriate length and finished in accordance with conventional good practice.

Dwarf walls and dormer cheeks — between studs

A.20 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. The procedure continues in the same manner as described in section A.9.

Dwarf walls and dormer cheeks — between studs and lining

A.21 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.22 A second layer of the product is temporarily fixed with clout nails to the inner face of the timber studding.

A.23 The line of the timber studs is marked on the boards to allow fixing of plasterboard.

A.24 The insulation is sealed at all service penetrations.

A.25 The plasterboard is fixed over the product and secured with conventional nails or screws to the appropriate length and finished in accordance with conventional good practice.

Bibliography

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BRE Report BR 443 : 2019 *Conventions for U-value calculations*

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BS 5534 : 2014 + A2 : 2018 *Code of practice for slating and tiling (including shingles)*

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BS EN 1604 : 1997 *Thermal insulating products for building applications — Determination of dimensional stability under specified temperature and humidity conditions*

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ISO 9001 : 2015 *Quality management systems — Requirements*

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PN EN 826 : 1998 *Thermal insulating products for building applications — Determination of compression behaviour*

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