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## Agrément Certificate

23/6874

Product Sheet 4 Issue 1

### UNILIN XTROLINER (XO)

### UNILIN XTROLINER FRAMING BOARD (XO/FB)

This Agrément Certificate Product Sheet<sup>(1)</sup> relates to Unilin XtroLiner Framing Board (XO/FB), a foil-faced rigid polyisocyanurate (PIR) foam board, for use as insulation in new and existing conventional timber- or steel-frame walls with a masonry outer leaf or a weathertight ventilated cladding system, in domestic and non-domestic buildings, with height restrictions in some cases. The product may be installed between studding and/or as insulated sheathing.

(1) Hereinafter referred to as 'Certificate'.

#### The assessment includes

##### Product factors:

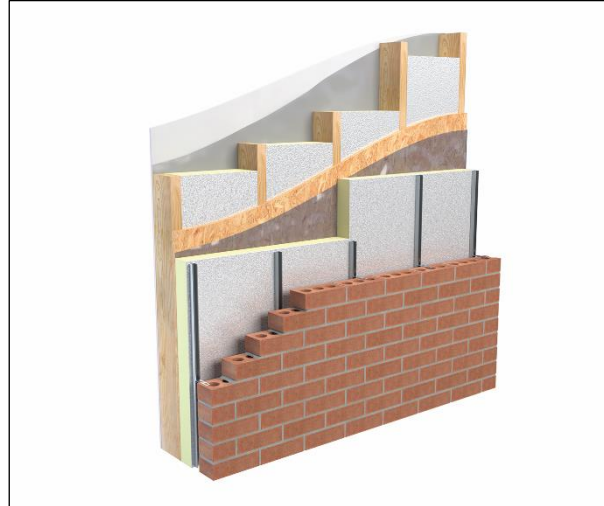
- compliance with Building Regulations
- compliance with additional regulatory or non-regulatory information where applicable
- evaluation against technical specifications
- assessment criteria and technical investigations
- uses and design considerations

##### 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.*

#### British Board of Agrément

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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 Framing Board (XO/FB), if installed, used and maintained in accordance with this Certificate, can satisfy or contribute to satisfying the relevant requirements of the following Building Regulations:



#### The Building Regulations 2010 (England and Wales) (as amended)

<b>Requirement:</b> B3(4)	<b>Internal fire spread (structure)</b>
Comment:	The product can contribute to satisfying this Requirement. See section 2 of this Certificate.
<b>Requirement:</b> B4(1)	<b>External fire spread</b>
Comment:	The product is restricted by this Requirement. See section 2 of this Certificate.
<b>Requirement:</b> C2(c)	<b>Resistance to moisture</b>
Comment:	The product can contribute to satisfying this Requirement. See section 3 of this Certificate.
<b>Requirement:</b> L1(a)(i)	<b>Conservation of fuel and power</b>
Comment:	The product can contribute to satisfying this Requirement; however, compensating fabric measures may be required. See section 6 of this Certificate.
<b>Requirement:</b> 7(1)	<b>Materials and workmanship</b>
Comment:	The product is acceptable. See sections 8 and 9 of this Certificate.
<b>Requirement:</b> 7(2)	<b>Materials and workmanship</b>
Comment:	The product is restricted by this Regulation. See section 2 of this Certificate.
<b>Regulation:</b> 25B	<b>Nearly zero-energy requirements for new buildings</b>
<b>Regulation:</b> 26	<b>CO<sub>2</sub> emission rates for new buildings</b>
<b>Regulation:</b> 26A	<b>Fabric energy efficiency rates for new dwellings (applicable to England only)</b>
<b>Regulation:</b> 26A	<b>Primary energy rates for new buildings (applicable to Wales only)</b>
<b>Regulation:</b> 26B	<b>Fabric performance values for new dwellings (applicable to Wales only)</b>
<b>Regulation:</b> 26C	<b>Target primary energy rates for new buildings (applicable to England only)</b>
<b>Regulation:</b> 26C	<b>Energy efficiency rating (applicable to Wales only)</b>
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)

<b>Regulation:</b> 8(1)	<b>Fitness and durability of materials and workmanship</b>
Comment:	The product is acceptable. See sections 8 and 9 of this Certificate.
<b>Regulation:</b> 8(3)	<b>Fitness and durability of materials and workmanship</b>
Comment:	The product is restricted by this Regulation. See section 2 of this Certificate.

<b>Regulation:</b>	<b>9</b>	<b>Building standards – construction</b>
Standard:	2.4	Cavities
Comment:		The product can contribute to satisfying this Standard, with reference to clauses 2.4.2 <sup>(1)(2)</sup> , 2.4.4 <sup>(1)</sup> and 2.4.6 <sup>(2)</sup> . 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 <sup>(1)</sup> and 2.6.6 <sup>(2)</sup> . 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 <sup>(1)(2)</sup> , 3.15.4 <sup>(1)(2)</sup> and 3.15.5 <sup>(1)(2)</sup> . See section 3 of this Certificate.
Standard:	6.1(b)(c)(d)	Energy demand and carbon dioxide emissions
Comment:		The product can contribute to satisfying this Standard with reference to clauses 6.1.1 <sup>(1)</sup> and 6.1.2 <sup>(2)</sup> ; 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 6.2.1 <sup>(1)(2)</sup> , 6.2.3 <sup>(1)</sup> , 6.2.4 <sup>(2)</sup> , 6.2.8 <sup>(1)</sup> , 6.2.9 <sup>(2)</sup> and 6.2.12 <sup>(1)</sup> ; 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 <sup>(1)(2)</sup> , 7.1.6 <sup>(1)(2)</sup> , and 7.1.7 <sup>(1)(2)</sup> . See section 6 of this Certificate.
<b>Regulation:</b>	<b>12</b>	<b>Building standards – conversion</b>
Comment:		All 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 <sup>(1)</sup> and Schedule 6 <sup>(1)</sup> .

(1) Technical Handbook (Domestic).

(2) Technical Handbook (Non-Domestic).



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

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

Regulation:	39(a)(i)	Conservation measures
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 a building 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 Framing Board (XO/FB), if installed, used and maintained in accordance with this Certificate, can satisfy or contribute to satisfying the relevant requirements in relation to *NHBC Standards*, Chapters 6.2 *External timber framed walls* and 6.10 *Light steel framed walls and floors*.

## Fulfilment of Requirements

The BBA has judged Unilin XtroLiner Framing Board (XO/FB) to be satisfactory for use as described in this Certificate. The product has been assessed, for use as insulation in new and existing conventional timber- or steel-frame walls with a masonry outer leaf or a weathertight ventilated cladding system, in domestic and non-domestic buildings, with height restrictions in some cases. The product may be installed between studding and/or as insulated sheathing.

## ASSESSMENT

### Product description and intended use

The Certificate holder provided the following description for the product under assessment. Unilin XtroLiner Framing Board (XO/FB) comprises a rigid polyisocyanurate (PIR) foam board, faced with an aluminium foil-facing on both sides.

The product has the nominal characteristics given in Table 1.

*Table 1 Nominal characteristics*

Length (mm)	2400
Width (mm)	1200
Thickness (mm)	50, 60, 75, 80, 100, and 120
Edge details	Square

### Applications

The product is intended for use as insulation in the following applications, on new and existing domestic buildings:

- between the inner leaf studs of conventional timber-frame cavity walls with a clear cavity and a masonry outer skin or a weathertight ventilated cladding system
- between the inner leaf studs of conventional steel-frame cavity walls with a clear cavity and a masonry outer skin or a weathertight ventilated cladding system
- as insulated sheathing over walls of conventional timber-frame or steel-frame buildings with a clear cavity and a masonry outer skin or a weathertight ventilated cladding system.

## 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

Not applicable.

### 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 2.

*Table 2 Reaction to fire classification*

Product assessed	Assessment method	Requirement	Result <sup>(1)(2)</sup>
Unilin XtroLiner Framing Board (XO/FB)	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) This classification is valid for thicknesses of 25 to 160 mm.

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. The product must be contained by a fire-resistant lining board manufactured in accordance with BS EN 520 : 2004, with joints fully sealed and supported by timber studs or battens.

2.1.3 In England, the product must not be used on residential buildings with a storey 11 m or more in height or on other buildings with a storey 18m or more in height.

2.1.4 In Wales and Northern Ireland, the product must not be used on buildings with a storey 18 m or more in height.

2.1.5 In Scotland, the product must not be used on buildings that have a storey 11 m or more in height, or within 1 m of a relevant boundary.

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.

#### 2.2 Resistance to fire

Where the product is incorporated in a wall construction where fire resistance is required by the documents supporting the national Building Regulations, the fire resistance must be confirmed by a suitably experienced and competent individual.

### 3 Hygiene, health and the environment

Data were assessed for the following characteristics.

#### 3.1 Water vapour permeability

The water vapour resistivity/resistance values may be taken as stated in Table 3.

**Table 3 Water vapour resistivity/resistance**

Product assessed	Assessment method	Requirement	Result
PIR insulation	BS EN ISO 10456 : 2007	Value achieved	300 MN·s·g <sup>-1</sup> ·m <sup>-1</sup>
Foil facing	BS 5250 : 2021		1000 MN·s·g <sup>-1</sup>

#### 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 results are given in Table 4.

**Table 4 Thermal conductivity**

Product assessed	Assessment method	Requirement	Result
Unilin Xtroliner Framing Board (XO/FB)	BS EN 13165 : 2012	Declared value ( $\lambda_D$ )	0.021 W·m <sup>-1</sup> ·K <sup>-1</sup>

##### 6.2 Thermal performance

The facing was tested for emissivity and the result is given in Table 5.

**Table 5 Emissivity of the foil facing**

Product assessed	Assessment method	Requirement	Result
Foil facing	BS EN 16012 : 2012	Value achieved	0.1

##### 6.3 Conservation of fuel and power

6.3.1 The U value of completed wall construction will depend on the insulation thickness, number and type of fixings, the insulating value of the substrate, and its internal finish. Example U values are given in Tables 6 to 9 of this Certificate.

**Table 6 Example U values — between timber studs<sup>(1)/(2)</sup>**

U value (W·m <sup>-2</sup> ·K <sup>-1</sup> )	Unilin Xtroliner Framing Board (XO/FB) thickness	
	(mm)	
0.13	— <sup>(3)</sup>	
0.15	— <sup>(3)</sup>	
0.17	— <sup>(3)</sup>	
0.18	— <sup>(3)</sup>	
0.21	— <sup>(3)</sup>	
0.26	100	
0.28	80	
0.30	75	

(1) Construction, external to internal: 102.5 mm brick ( $\lambda = 0.77 \text{ W}\cdot\text{m}^{-1}\cdot\text{K}^{-1}$ ); 50 mm clear cavity; breather membrane; 9 mm OSB (oriented strand board) sheathing board ( $\lambda = 0.13 \text{ W}\cdot\text{m}^{-1}\cdot\text{K}^{-1}$ ); XO/FB insulation within a 140 mm timber frame (15% fraction), and a residual low e airspace; air and vapour control layer (AVCL); 15 mm plasterboard ( $\lambda = 0.25 \text{ W}\cdot\text{m}^{-1}\cdot\text{K}^{-1}$ ).

(2) Nearest available thickness.

(3) See section 6.3.4.

**Table 7 Example U values — between steel studs<sup>(1)(2)</sup>**

U value (W·m <sup>-2</sup> ·K <sup>-1</sup> )	Unilin XtroLiner Framing Board (XO/FB) thickness (mm)
0.13	— <sup>(3)</sup>
0.15	— <sup>(3)</sup>
0.17	— <sup>(3)</sup>
0.18	— <sup>(3)</sup>
0.21	— <sup>(3)</sup>
0.26	— <sup>(3)</sup>
0.28	— <sup>(3)</sup>
0.30	— <sup>(3)</sup>
0.33	80

(1) Construction, external to internal: 102.5 mm brick ( $\lambda = 0.77 \text{ W}\cdot\text{m}^{-1}\cdot\text{K}^{-1}$ ); 50 mm clear cavity; breather membrane; 9 mm OSB (oriented strand board) sheathing board ( $\lambda = 0.13 \text{ W}\cdot\text{m}^{-1}\cdot\text{K}^{-1}$ ); XO/FB insulation within a 90 mm light steel frame (0.2% fraction) and a residual low e airspace; AVCL; 15 mm plasterboard ( $\lambda = 0.25 \text{ W}\cdot\text{m}^{-1}\cdot\text{K}^{-1}$ ).

(2) Nearest available thickness.

(3) See section 6.3.4.

**Table 8 Example U values — timber frame sheathing<sup>(1)(2)(3)</sup>**

U value (W·m <sup>-2</sup> ·K <sup>-1</sup> )	Unilin XtroLiner Framing Board (XO/FB) thickness (clear 140 mm timber frame) (mm) <sup>(4)</sup>	Unilin XtroLiner Framing Board (XO/FB) thickness (fully filled 140 mm timber frame) (mm) <sup>(5)</sup>
0.13	— <sup>(7)</sup>	50
0.15	120	50
0.17	100	50
0.18	100	50
0.21	75	— <sup>(6)</sup>
0.26	60	— <sup>(6)</sup>
0.28	50	— <sup>(6)</sup>
0.30	50	— <sup>(6)</sup>

(1) Construction, external to internal: 102.5 mm brick ( $\lambda = 0.77 \text{ W}\cdot\text{m}^{-1}\cdot\text{K}^{-1}$ ); 50 mm low e cavity; XO/FB; breather membrane; 9 mm OSB (oriented strand board) sheathing board ( $\lambda = 0.13 \text{ W}\cdot\text{m}^{-1}\cdot\text{K}^{-1}$ ); 140 mm timber frame (15% fraction); AVCL; 15 mm plasterboard ( $\lambda = 0.25 \text{ W}\cdot\text{m}^{-1}\cdot\text{K}^{-1}$ ).

(2) Nearest available thickness.

(3) Calculations based upon 4.4 stainless steel cavity wall ties per m<sup>2</sup> (6.6 mm<sup>2</sup> cross-sectional area,  $\lambda = 17 \text{ W}\cdot\text{m}^{-1}\cdot\text{K}^{-1}$ ).

(4) XO/FB insulation installed against the sheathing board with no insulation in the timber frame.

(5) Insulation installed against the sheathing board with 120 mm of XO/FB insulation, and a residual low e airspace, in the timber frame with a 15% timber frame fraction.

(6) Achieves the target U value without XO/FB as insulated sheathing.

(7) See section 6.3.4.

**Table 9 Example U values — steel frame sheathing<sup>(1)(2)(3)</sup>**

U value (W·m <sup>-2</sup> ·K <sup>-1</sup> )	Unilin XtroLiner Framing Board (XO/FB) thickness (clear 90 mm steel frame) (mm) <sup>(4)</sup>	Unilin XtroLiner Framing Board (XO/FB) thickness (fully filled 90 mm steel frame) (mm) <sup>(5)</sup>
0.13	— <sup>(6)</sup>	100
0.15	120	75
0.17	100	50
0.18	100	50
0.21	75	50
0.26	60	50
0.28	50	50
0.30	50	50

(1) Construction, external to internal: 102.5 mm brick ( $\lambda = 0.77 \text{ W}\cdot\text{m}^{-1}\cdot\text{K}^{-1}$ ); 50 mm low e cavity, XO/FB; breather membrane; 9 mm OSB sheathing board ( $\lambda = 0.13 \text{ W}\cdot\text{m}^{-1}\cdot\text{K}^{-1}$ ); 90 mm light steel frame (0.2% fraction); AVCL; 15 mm plasterboard ( $\lambda = 0.25 \text{ W}\cdot\text{m}^{-1}\cdot\text{K}^{-1}$ ).

(2) Nearest available thickness.

(3) Calculations based upon 4.4 stainless steel cavity wall ties per m<sup>2</sup> (6.6 mm<sup>2</sup> cross-sectional area,  $\lambda = 17 \text{ W}\cdot\text{m}^{-1}\cdot\text{K}^{-1}$ ).

(4) XO/FB insulation installed against the sheathing board with no insulation in the steel frame.

(5) XO/FB insulation installed against the sheathing board with 80 mm of XO/FB insulation, and a residual low e airspace, in the steel frame with a 0.2% steel frame fraction.

(6) See section 6.3.4.

**Table 10 Example U Values — masonry rainscreen application<sup>(1)(2)(3)</sup>**

U Value (W·m <sup>-2</sup> ·K <sup>-1</sup> )	Unilin XtroLiner Framing Board (XO/FB) thickness (mm)
0.13	— <sup>(4)</sup>
0.15	— <sup>(4)</sup>
0.17	— <sup>(4)</sup>
0.18	— <sup>(4)</sup>
0.21	— <sup>(4)</sup>
0.26	120
0.28	120
0.30	100

(1) Construction, external to internal: 10 mm rainscreen cladding, open fully ventilated 50 mm clear cavity, XO/FB, 140 mm dense concrete block ( $\lambda = 1.13 \text{ W}\cdot\text{m}^{-1}\cdot\text{K}^{-1}$ ), 15 mm dot and dab adhesive cavity (20% adhesive bridge) and 15 mm plasterboard ( $\lambda = 0.25 \text{ W}\cdot\text{m}^{-1}\cdot\text{K}^{-1}$ ).

(2) Nearest available thickness.

(3) A fixing correction factor ( $\Delta U_f$ ) of  $0.1 \text{ W}\cdot\text{m}^{-1}\cdot\text{K}^{-1}$  has been applied, to allow for the thermal bridging of the rainscreen brackets.

(4) See section 6.3.4.

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/services 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 this product were assessed.

8.2 Specific test data were assessed for the following.



**Table 11 Dimensional stability and water absorption**

Product assessed	Assessment method	Requirement	Result
Unilin XtroLiner Framing Board (XO/FB)	Dimensional stability to BS EN 1604 : 1997 (70°C and 90% RH for 48 hours)	Length and width ≤ 1 % change Thickness ≤ 4 % change	Pass
Unilin XtroLiner Framing Board (XO/FB)	Dimensional stability to BS EN 1604 : 1997 (-20°C for 48 hours)	Length and width ≤ 2 % change Thickness ≤ 0.5 % change	Pass
Unilin XtroLiner Framing Board (XO/FB)	Short-term water absorption by partial immersion to BS EN 1609 : 2013 (Method A)	≤ 1.25 kg·m <sup>-2</sup>	Pass

### 8.3 Service life

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

## PROCESS ASSESSMENT

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

### 9 Design, installation, workmanship and maintenance

#### 9.1 Design

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

9.1.2 External framed cavity walls must be designed and constructed in accordance with the relevant recommendations of:

- BS 5250 : 2021
- BS 8000-3 : 2020
- BS EN 351-1 : 2007
- BS EN 845-1 : 2013
- BS EN 1993-1-2 : 2005 and its UK National Annex
- BS EN 1993-1-3 : 2006 and its UK National Annex
- BS EN 1995-1-1 : 2004 and its UK National Annex
- BS EN 1996-1-1 : 2005 and its UK National Annex
- BS EN 1996-1-2 : 2005 and its UK National Annex
- BS EN 1996-2 : 2006 and its UK National Annex
- BS EN 1996-3 : 2006 and its UK National Annex

9.1.3 As with other forms of cavity wall insulation, where buildings need to comply with the *NHBC Standards 2024*, specifiers must observe the requirements of that document.

9.1.4 Timber or steel frame wall ties with insulation-retaining fixings and, if required, any additional ties to BS EN 845-1 : 2013 must be used for structural stability in accordance with BS EN 1996-1-1 : 2005, BS EN 1996-2 : 2006 and BS EN 1996-3 : 2006, and their UK National Annexes.

9.1.5 This application requires an air and vapour control layer (AVCL) behind the internal fire-resistant lining board, which must be a minimum thickness of 0.125 mm (500 gauge) polyethylene.

9.1.6 Care must be taken in the overall design and construction of walls incorporating the product to ensure the provision of appropriate:

- cavity trays and damp-proof courses (DPCs)
- cavity barriers and fire dampers
- resistance to the ingress of precipitation, moisture and dangerous gases from the ground
- resistance to sound transmission when flanking separating walls and floors.

9.1.7 It is essential that external masonry cavity walls are designed and constructed to incorporate the precautions in this Certificate to prevent moisture penetration.

9.1.8 Window and door opening reveals should be constructed incorporating a cavity barrier/closer/DPC, as required.

9.1.9 Services which penetrate the dry lining (eg light switches, power outlets) must be kept to a minimum to limit damage to the AVCL. In addition, to preserve the fire resistance of the wall, any penetrations should be enclosed in a suitably tested proprietary fire-rated system.

9.1.10 As with other insulation products, it may be necessary in some cases to de-rate electrical cables buried in insulation. BS 7671 : 2018 recommends that where wiring is completely surrounded by insulation it may need to be de-rated to as low as half its free air-current-carrying capacity. Guidance should be sought from a qualified electrician.

9.1.11 The detailed provisions given in the documents supporting the national Building Regulations for when the product is installed in close proximity to certain flue pipes and/or heat-producing appliances must be followed.

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

9.1.13 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.

#### *Interstitial condensation*

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

9.1.15 If the product is to be used in the external wall of rooms expected to have high humidity, care must be taken to provide adequate permanent ventilation to avoid possible problems from the formation of interstitial condensation.

#### *Surface condensation*

9.1.16 In England and Wales, walls will adequately limit the risk of surface condensation when the thermal transmittance (U value) does not exceed  $0.7 \text{ W}\cdot\text{m}^{-2}\cdot\text{K}^{-1}$  at any point, and the junctions with other elements are designed in accordance with the guidance referred to in section 9.1.13 of this Certificate.

9.1.17 For buildings in Scotland, wall constructions will be acceptable when the thermal transmittance (U value) does not exceed  $1.2 \text{ W}\cdot\text{m}^{-2}\cdot\text{K}^{-1}$  at any point, and the junctions with other elements are designed in accordance with the guidance referred to in BS 5250 : 2021. Further guidance may be obtained from BRE Report BR 262 : 2002 and section 9.1.13 of this Certificate.

#### *Buildings up to 18 metres high (see also section 2 of this Certificate)*

9.1.18 The residual cavity width to be maintained during construction is 50 mm. This may reduce to 25 mm in isolated areas due to individual construction features (a minimum of 50 mm residual cavity width is required by the NHBC<sup>(1)</sup>). This may be achieved by designing a cavity width which takes into account the dimensional tolerances of the components which make up the wall (by reference to the British Standards relating to the bricks, blocks and boards, or by using the data from the respective manufacturers). Allowances may need to be made for the quality of building operatives and the degree of site supervision or control available. The limitations in respect of exposure of the proposed building as set out in Table 12 must also be observed.

(1) The NHBC requirement for a residual cavity width is increased to 75 mm in areas of very severe exposure where the outer leaf is fair-faced masonry.

**Table 12 Maximum allowable exposure index  $E^{(1)}$**

Construction	Maximum allowable exposure index $E^{(1)}$
All external masonry walls protected by: rendering (to BS EN 13914-1 : 2016), tile hanging, slate hanging, or timber, plastic or metal weatherboarding or cladding	No restriction
One or more external masonry walls constructed from facing clay brickwork or natural stone, the porosity of which exceeds 20% by volume. Mortar joints must be flush pointed or weatherstruck	100
One or more external masonry walls constructed from calcium silicate bricks, concrete blocks, reconstituted stone, or natural stone, the porosity of which is less than 20% by volume, or any material with raked mortar joints	88

(1) To BS 5618 : 1985.

9.1.19 From ground level, the maximum height of continuous cavity walls must not exceed 12 m; above 12 m, the maximum height of continuous cavity walls must not exceed 7 m. In both cases, breaks should be in the form of continuous horizontal cavity trays and weepholes discharging to the outside.

9.1.20 An external render coat or other suitable finish should be applied in locations where such application would be normal practice; care should be taken to ensure that the residual cavity is not bridged by mortar.

## 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.

### *Insulated sheathing*

9.2.3 The timber or steel frame must be constructed ahead of the outer leaf, as the boards are fastened to the cavity face of the frame. It is essential that the spacing of wall ties/clips allows one long edge of each board to be secured at a minimum of two points.

9.2.4 Vertical joints in the boards must be staggered and all joints tightly butted. Where protrusions occur in the cavity, the boards should be carefully cut to fit.

9.2.5 If installation of the boards is terminated below the highest level of the wall, the top edge of the insulation must be protected by a cavity tray and alternate perpend joints of the masonry outer leaf raked out to provide adequate drainage of water from the tray.

9.2.6 In all situations, it is particularly important to ensure during installation that:

- installation is carried out to the highest level on each wall, or the top edge of the insulation is protected by a cavity tray
- cavity trays are used with appropriate stop ends and weepholes at lintel level
- cavity battens and/or boards are used during construction to prevent bridging by mortar droppings
- wall ties are installed correctly and are thoroughly clean
- excess mortar is cleaned from the cavity face of the leading leaf and any debris removed from the cavity
- mortar droppings are cleaned from the exposed edges of installed boards
- insulation boards are properly installed and either butt jointed, or interlocked using the tongue and groove or rebated edges
- the DPC at ground level does not project into the cavity as it can form a trap for mortar bridging
- raked or recessed mortar joints are avoided in very severe exposure areas.

### 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

As the product is confined within the wall cavity and has suitable durability, maintenance is not required.

## 10 **Manufacture**

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

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

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

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

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

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

†10.2 The BBA has undertaken to review the above measures on a regular basis through a surveillance process, to verify that the specifications and quality control operated by the manufacturer are being maintained.

## 11 **Delivery and site handling**

11.1 The Certificate holder stated that the product is delivered to site in in polythene-wrapped packs. Each pack contains a label with the manufacturer'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.

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).

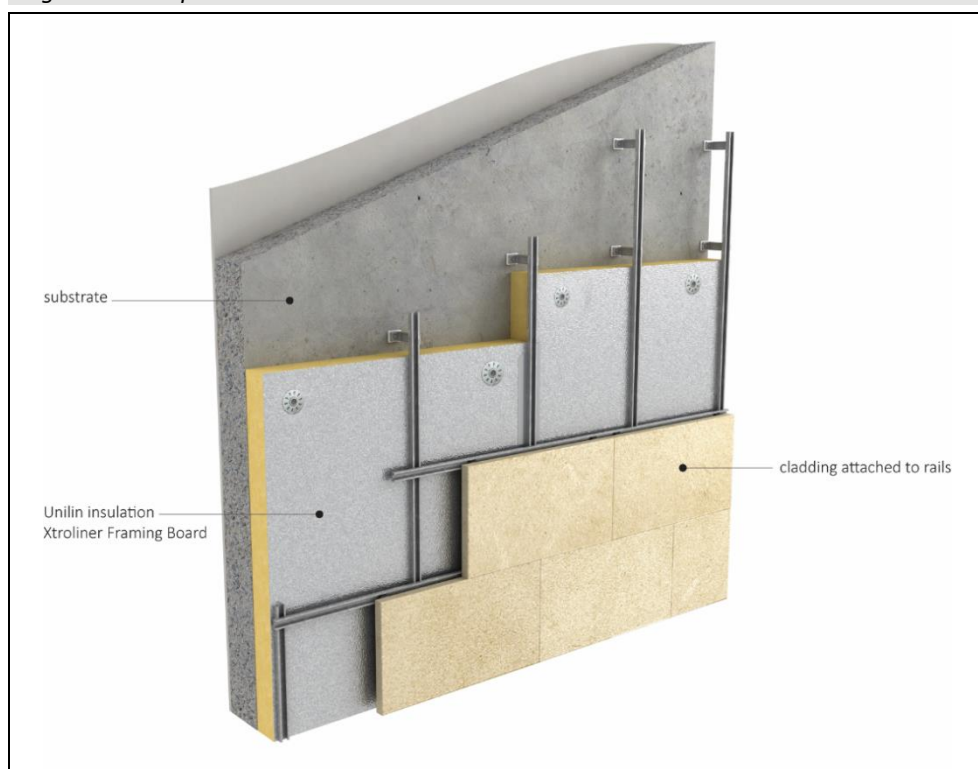
### Additional information on installation

Installation must be in accordance with the Certificate holder's instructions and this Certificate. A summary of the procedure is provided below:

#### **On the external face of masonry walls**

A.1 The product is installed fully restrained against the external face of the masonry wall in a brick-bond pattern with suitable proprietary insulation fasteners (see Figure 1).

*Figure 1 Example installation*



### **Between studs and on the external face of sheathing/studs — external to internal**

A.2 Unilin XtroLiner Framing Board (XO/FB) is fixed to the outside of the sheathing board (when installed) or to the outside face of steel studs using suitable proprietary insulation fasteners.

A.3 The product is closely butted, and joints are staggered.

A.4 The product should be cut to fit tightly between the timber studding/steel studding and positioned against the inner face of the sheathing board or level with the external face of steel studs. Any gaps should be filled with expanding insulation foam (outside the scope of this Certificate). In timber-frame constructions, the product should be held in place by nails or timber battens to the warm side of the insulation.

A.5 The void created by the space between the inner surface of the product and the dry lining can be utilised as an insulated service duct. It is recommended that services which penetrate the AVCL, such as light switches and power outlets, are kept to a minimum to limit damage to the AVCL. In addition, any penetrations should be adequately sealed to preserve the AVCL integrity.

A.6 A sealed polythene AVCL, with lapped and sealed joints, is placed over the stud face before applying the internal finish.

## Bibliography

- BRE Report BR 262 : 2002 *Thermal insulation: avoiding risks*
- BRE Report BR 443 : 2019 *Conventions for U-value calculations*
- BS EN 845-1 : 2013 + A1 : 2016 *Specification for ancillary components for masonry — Wall ties, tension straps, hangers and brackets*
- BS 5250 : 2021 *Management of moisture in buildings — Code of practice*
- BS 5618 : 1985 *Code of practice for thermal insulation of cavity walls (with masonry or concrete inner and outer leaves) by filling with urea-formaldehyde (UF) foam systems*
- BS 8000-3 : 2020 *Workmanship on construction sites — Masonry — Code of practice*
- BS EN 351-1 : 2007 *Durability of wood and wood-based products — Preservative-treated solid wood — Classification of preservative penetration and retention*
- BS EN 520 : 2004 + A1 : 2009 *Gypsum plasterboards — Definitions, requirements and test methods*
- BS EN 1604 : 1997 *Thermal insulating products for building applications — Determination of dimensional stability under specified temperature and humidity conditions*
- BS EN 1609 : 2013 *Thermal insulating products for building applications — Determination of short term water absorption by partial immersion*
- BS EN 1993-1-2 : 2005 *Eurocode 3 — Design of steel structures — General rules*  
NA to BS EN 1993-1-2 : 2005 *UK National Annex to Eurocode 3 — Design of steel structures — General rules*
- BS EN 1993-1-3 : 2006 *Eurocode 3 : Design of steel structures — General rules — Supplementary rules for cold-formed members and sheeting*  
NA to BS EN 1993-1-3 : 2006 *UK National Annex to Eurocode 3 : Design of steel structures — General rules — Supplementary rules for cold-formed members and sheeting*
- BS EN 1995-1-1 : 2004 + A2 : 2014 *Eurocode 5 — Design of timber structures — General — Common rules and rules for buildings*  
NA to BS EN 1995-1-1 : 2004 + A2 : 2014 *UK National Annex to Eurocode 5 — Design of timber structures — General — Common rules and rules for buildings*
- BS EN 1996-1-1 : 2005 + A1 : 2012 *Eurocode 6 — Design of masonry structures — General rules for reinforced and unreinforced masonry structures*  
NA to BS EN 1996-1-1 : 2005 + A1 : 2012 *UK National Annex to Eurocode 6 — Design of masonry structures — General rules for reinforced and unreinforced masonry structures*
- BS EN 1996-1-2 : 2005 *Eurocode 6 — Design of masonry structures — General rules — Structural fire design*  
NA to BS EN 1996-1-2 : 2005 *UK National Annex to Eurocode 6 — Design of masonry structures — General rules — Structural fire design*
- BS EN 1996-2 : 2006 *Eurocode 6 — Design of masonry structures — Design considerations, selection of materials and execution of masonry*  
NA to BS EN 1996-2 : 2006 *UK National Annex to Eurocode 6 — Design of masonry structures — Design considerations, selection of materials and execution of masonry*
- BS EN 1996-3 : 2006 *Eurocode 6 — Design of masonry structures — Simplified calculation methods for unreinforced masonry structures*  
NA + A1 : 2014 to BS EN 1996-3 : 2006 *UK National Annex to Eurocode 6 — Design of masonry structures — Simplified calculation methods for unreinforced masonry structures*

BS EN 13165 : 2012 + A2 : 2016 *Thermal insulation products for buildings — Factory made rigid polyurethane foam (PUR) products — Specification*

BS EN 13914-1 : 2016 *Design, preparation and application of external rendering and internal plastering — External rendering*

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 10456 : 2007 *Building materials and products — Hygrothermal properties — Tabulated design values and procedures for determining declared and design thermal values*

ISO 9001 : 2015 *Quality management systems — Requirements*

ISO 14001 : 2015 *Environmental Management systems — Requirements with guidance for use*

ISO 45001 : 2018 *Occupational health and safety management systems — Requirements with guidance for use*

NF EN 13501-1 : 2018 *Fire classification of construction products and building elements — Classification using data from reaction to fire tests*



### 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.