

# Kingspan Insulation Limited

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**Agrément Certificate**

**14/5133**

Product Sheet 4 Issue 2

## KINGSPAN THERMA STRUCTURAL APPLICATIONS

### KINGSPAN TW55 THERMAWALL FRAMING BOARD INSULATION

This Agrément Certificate Product Sheet<sup>(1)</sup> relates to Kingspan TW55 Thermawall Framing Board Insulation, a rigid polyisocyanurate (PIR) foam board with a composite foil-facing on both sides, for use as insulation in new and existing conventional timber- or steel-frame walls with a masonry outer leaf, in domestic and non-domestic buildings, with height restrictions in some cases. The product may be installed between timber studs and/or as an insulated sheathing over the timber- or steel-frame.

(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

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 Second issue: 16 April 2024

Originally certificated on 18 May 2017



#### 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

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 Kingspan TW55 Thermawall Framing Board Insulation, 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(a)	<b>Resistance to moisture</b>
Comment:	The product can contribute to satisfying this Requirement. See section 3 of this Certificate.
<b>Requirement:</b> C2(b)	<b>Resistance to moisture</b>
Comment:	The product can contribute to satisfying this Requirement. See section 9 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. See section 6 of this Certificate.
<b>Regulation:</b> 7(1)	<b>Materials and workmanship</b>
Comment:	The product is acceptable. See sections 8 and 9 of this Certificate.
<b>Regulation:</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>CO2 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. See section 6 of this Certificate.



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

<b>Regulation:</b>	<b>8(1)</b>	<b>Fitness and durability of materials and workmanship</b>
Comment:		The product is acceptable. See sections 8 and 9 of this Certificate.
<b>Regulation:</b>	<b>8(3)</b>	<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 in some cases, 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, with reference to clauses 2.6.5 <sup>(1)</sup> and 2.6.6 <sup>(2)</sup> . See section 2 of this Certificate.
Standard:	3.4	Moisture from the ground
Comment:		The product can contribute to satisfying this Standard, with reference to clauses 3.4.1 <sup>(1)(2)</sup> and 3.4.5 <sup>(1)(2)</sup> . See section 3 of this Certificate.
Standard:	3.10	Precipitation
Comment:		The product can contribute to satisfying this Standard, with reference to clause 3.10.1 <sup>(1)(2)</sup> and 3.10.5 <sup>(1)(2)</sup> . See section 9 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)	Energy demand
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> . 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> , 6.2.6 <sup>(1)</sup> , 6.2.7 <sup>(1)(2)</sup> , 6.2.8 <sup>(1)(2)</sup> , 6.2.9 <sup>(1)(2)</sup> , 6.2.10 <sup>(1)(2)</sup> , 6.2.11 <sup>(2)</sup> and 6.2.12 <sup>(1)</sup> . See section 6 of this Certificate.
Standard:	7.1(a)(b)	Statement of sustainability
Comment:		The product can contribute to satisfying the relevant requirements of Regulation 9, Standards 1 to 6, and therefore will contribute to a construction meeting a bronze level of sustainability as defined in this Standard. In addition, the product can contribute to a construction meeting a higher level of sustainability as defined in this Standard, with reference to clauses 7.1.4 <sup>(1)</sup> , 7.1.6 <sup>(1)(2)</sup> , 7.1.7 <sup>(1)</sup> , 7.1.9 <sup>(2)</sup> and 7.1.10 <sup>(2)</sup> . See section 6 of this Certificate.
<b>Regulation:</b>	<b>12</b>	<b>Building standards – conversion</b>
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 <sup>(1)(2)</sup> and Schedule 6 <sup>(1)(2)</sup> .
		(1) Technical Handbook (Domestic).
		(2) Technical Handbook (Non-Domestic).



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

<b>Regulation:</b>	<b>23(1)(a)(i)</b>	<b>Fitness of materials and workmanship</b>
<b>Comment:</b>	<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>
<b>Comment:</b>		The product is restricted by this Regulation. See section 2 of this Certificate.
<b>Regulation:</b>	<b>28(a)</b>	<b>Resistance to moisture and weather</b>
<b>Comment:</b>		The product can contribute to satisfying this Regulation. See section 3 of this Certificate.
<b>Regulation:</b>	<b>28(b)</b>	<b>Resistance to moisture and weather</b>
<b>Comment:</b>		The product can contribute to satisfying this Regulation. See section 9 of this Certificate.
<b>Regulation:</b>	<b>29</b>	<b>Condensation</b>
<b>Comment:</b>		The product can contribute to satisfying this Regulation. See section 3 of this Certificate.
<b>Regulation:</b>	<b>35(4)</b>	<b>Internal fire spread – structure</b>
<b>Comment:</b>		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>
<b>Comment:</b>		The product is restricted by this Regulation. See section 2 of this Certificate.
<b>Regulation:</b>	<b>39(a)(i)</b>	<b>Conservation measures</b>
<b>Comment:</b>		The product can contribute to satisfying this Regulation. See section 6 of this Certificate.
<b>Regulation:</b>	<b>40(2)</b>	<b>Target carbon dioxide emission rate</b>
<b>Regulation:</b>	<b>43(1)(2)</b>	<b>Renovation of thermal elements</b>
<b>Regulation:</b>	<b>43B</b>	<b>Nearly zero-energy requirements for new buildings</b>
<b>Comment:</b>		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, Kingspan TW55 Thermawall Framing Board Insulation, 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 Kingspan TW55 Thermawall Framing Board Insulation to be satisfactory for use as described in this Certificate. The product has been assessed as insulation for use between studding and/or as insulated sheathing over walls of conventional timber- or steel-frame buildings with a masonry outer skin.

## ASSESSMENT

### Product description and intended use

The Certificate holder provided the following description for the product under assessment. Kingspan TW55 Thermawall Framing Board Insulation consists of a rigid polyisocyanurate (PIR) foam board, faced on both sides with a low-emissivity aluminium Kraft trillaminate foil.

The product has the nominal characteristics given in Table 1.

*Table 1 Nominal characteristics of Kingspan TW55 Thermawall Framing Board Insulation*

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

#### Ancillary Item

The Certificate holder recommends cavity wall ties with insulation-retaining fixings to BS EN 845-1 : 2013 as ancillary items for use with the product, but these have not been assessed by the BBA and are outside the scope of this Certificate.

#### Applications

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

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

### 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
Thermawall TW55	BS EN 13501-1 : 2018	Value achieved	F

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

2.1.3 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 18 m 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

2.2.1 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.

2.2.2 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 should be confirmed by a suitably competent and experienced individual.

## 3 Hygiene, health and the environment

Data were assessed for the following characteristics.

### 3.1 Effectiveness against rising damp

3.1.1 The product was tested for short term water absorption by partial immersion and the result is given in Table 3.

*Table 3 Short term water absorption by partial immersion*

Product assessed	Assessment method	Requirement	Result
Thermawall TW55	BS EN 1609 : 2013	$\leq 1.25 \text{ kg}\cdot\text{m}^{-2}$	Pass

3.1.2 On the basis of data assessed, the product may be used in situations where it bridges the damp proof course (DPC) in walls; dampness from the ground will not pass through to the inner leaf provided the wall is detailed in accordance with the requirements and provisions of the national Building Regulations.

### 3.2 Water vapour permeability

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

*Table 4 Water vapour resistivity/resistance*

Product assessed	Assessment method	Requirement	Result
PIR insulation core	BS EN 12086 : 1997	Value achieved	$52 \text{ MN}\cdot\text{s}\cdot\text{g}^{-1}\cdot\text{m}^{-1}$
Foil-facing			$111 \text{ MN}\cdot\text{s}\cdot\text{g}^{-1}$

3.2.2 For the purposes of assessing the risk of interstitial 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

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
Thermawall TW55 (all thicknesses)	BS EN 13165 : 2012	Declared value ( $\lambda_D$ )	0.022 W·m <sup>-1</sup> ·K <sup>-1</sup>

### 6.2 Thermal performance

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

*Table 6 Emissivity of the foil-facing*

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

### 6.3 Conservation of fuel and power

6.3.1 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 Table 7.

*Table 7 Example U values – timber- and steel-frame walls<sup>(1)</sup>*

Target U Value (W·m <sup>-2</sup> ·K <sup>-1</sup> )	Insulation thickness (mm)			
	System 1 Between timber frame studs <sup>(1)</sup> (140 mm)	System 2 Between timber frame studs and over studs — sheathing <sup>(2)(5)</sup> (140 mm)	System 3 All over timber frame studs — sheathing <sup>(3)(5)</sup> (140 mm)	System 4 All over steel frame studs — sheathing <sup>(4)(5)</sup> (100 mm)
0.13	— <sup>(8)</sup>	80 + 80	150	150
0.15	100 + 95 <sup>(6)</sup>	80 + 50	130	130
0.17	85 + 80 <sup>(6)</sup>	80 + 40	115	115
0.18	150 <sup>(6)</sup>	65 + 40	105	105
0.21	130	— <sup>(7)</sup>	85	85
0.26	85	— <sup>(7)</sup>	65	65
0.28	80	— <sup>(7)</sup>	55	55
0.30	70	— <sup>(7)</sup>	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 clear cavity; breather membrane; 12 mm OSB (oriented strand board) sheathing board ( $\lambda = 0.13 \text{ W}\cdot\text{m}^{-1}\cdot\text{K}^{-1}$ ); Thermawall TW55 within a 140 mm timber-frame (15% fraction) and a residual low e airspace; AVCL; 12.5 mm plasterboard ( $\lambda = 0.25 \text{ W}\cdot\text{m}^{-1}\cdot\text{K}^{-1}$ ).
- (2) Construction, external to internal: 102.5 mm brick ( $\lambda = 0.77 \text{ W}\cdot\text{m}^{-1}\cdot\text{K}^{-1}$ ); 50 mm low emissivity (0.05) clear cavity; Thermawall TW55; breather membrane; 12 mm OSB (oriented strand board) sheathing board ( $\lambda = 0.13 \text{ W}\cdot\text{m}^{-1}\cdot\text{K}^{-1}$ ); Thermawall TW55 within a 140 mm timber-frame (15% fraction) and a residual low e airspace; AVCL; 12.5 mm plasterboard ( $\lambda = 0.25 \text{ W}\cdot\text{m}^{-1}\cdot\text{K}^{-1}$ ).
- (3) Construction, external to internal: 102.5 mm brick ( $\lambda = 0.77 \text{ W}\cdot\text{m}^{-1}\cdot\text{K}^{-1}$ ); 50 mm low emissivity (0.05) clear cavity; Thermawall TW55; breather membrane; 12 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; 12.5 mm plasterboard ( $\lambda = 0.25 \text{ W}\cdot\text{m}^{-1}\cdot\text{K}^{-1}$ ).
- (4) Construction, external to internal: 102.5 mm brick ( $\lambda = 0.77 \text{ W}\cdot\text{m}^{-1}\cdot\text{K}^{-1}$ ); 50 mm low emissivity (0.05) clear cavity; Thermawall TW55; breather membrane; 12 mm OSB (oriented strand board) sheathing board ( $\lambda = 0.13 \text{ W}\cdot\text{m}^{-1}\cdot\text{K}^{-1}$ ); 100 mm light steel-frame (0.2% fraction); AVCL; 12.5 mm plasterboard ( $\lambda = 0.25 \text{ W}\cdot\text{m}^{-1}\cdot\text{K}^{-1}$ ).
- (5) Fixings for sheathing assumed to be 5.6 fully-penetrating steel ( $\lambda = 50 \text{ W}\cdot\text{m}^{-1}\cdot\text{K}^{-1}$ ) fixings per square metre (300 mm centres), with a cross-sectional area of 9.6 mm<sup>2</sup> (3.5 mm diameter) and wall ties 18 mm<sup>2</sup> and 3.7 m<sup>-2</sup> ( $\lambda = 50 \text{ W}\cdot\text{m}^{-1}\cdot\text{K}^{-1}$ ).
- (6) 200 mm deep timber-frame.
- (7) Can be achieved with Systems 1, 3 or 4.
- (8) Can be achieved with System 2.

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

## 7 Sustainable use of natural resources

Not applicable.

## 8 Durability

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

8.2 Specific test data were assessed as shown in Table 8.

Product assessed	Assessment method	Requirement	Result
Thermawall TW55	Dimensional stability to BS EN 1604 : 2013 (70°C and 90% RH for 48 hours)	Length and width $\leq$ 2% change Thickness $\leq$ 6% change	Pass
	Thermal conductivity to BS EN 13165 : 2012 (70°C for 21 days)	$\lambda_D \leq 0.022 \text{ W}\cdot\text{m}^{-1}\cdot\text{K}^{-1}$	Pass

### 8.3 Service life

Under normal service conditions, the product will have a life at least 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 by the BBA 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 : 2023
- 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 *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 the principles of 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 Provided that external masonry cavity walls are designed and constructed to incorporate the precautions in this Certificate to prevent moisture penetration, the product will resist transfer of precipitation to the inner leaf.

9.1.8 Window and door opening reveals must incorporate a cavity barrier/closer/DPC, as required.

9.1.9 Services which penetrate the dry lining (eg light switches and 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 9 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 9 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 are provided in Annex A of this Certificate.

### *Insulated sheathing*

9.2.3 Installation must not be carried out until the moisture content of the timber-frame is less than 20% by mass.

9.2.4 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 the wall ties/clips allows the long edge of each board to be secured at a minimum of three points.

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

9.2.6 It is essential to have a tight fit between the boards and the adjoining studs and other timbers, and all gaps must be filled with expanding urethane sealant.

9.2.7 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 perpendicular joints of the masonry outer leaf are raked out, to provide adequate drainage of water from the tray.

9.2.8 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 weep holes 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 butt-jointed
- the DPC at ground level does not project into the cavity as they 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, the product is designed to be installed 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 packaging bearing the Certificate holder's trade name, product description and characteristics, batch number, production date, and the BBA logo incorporating the number of this Certificate.

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

11.2.1 The product must be protected from prolonged exposure to sunlight and should be stored either under cover or protected with opaque polythene sheeting. Where possible, packs should be stored inside. If outside, the product must be stacked flat, raised above ground level and not in contact with ground moisture.

11.2.2 The product is light and easy to handle, and care must be taken to avoid crushing the edges or corners. If damaged, the product must be discarded.

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

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.

### UKCA marking

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

### Management Systems Certification for production

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

### Additional information on installation

#### General

A.1 The product can be cut easily using a fine-toothed saw but care must be taken in handling to prevent damage, particularly at the edges.

A.2 Damaged boards should not be used.

A.3 Where a plasterboard lining is used, it should be of the vapour check type, or a separate polythene vapour control layer can be introduced. A vapour control layer may not be required in all applications: reference should be made to BS 5250 : 2021.

A.4 The insulation may be installed between timber studs or over timber- and steel-frame constructions. Guidance should be sought from the Certificate holder, but such advice is outside of the scope of this Certificate.

A.5 Boards should be tight fitting against the structure. Gaps should be filled with an expanding polyurethane sealant.

#### Procedure

##### *Between timber studs*

A.6 Boards should be fitted so that their edges are flush with the outer faces of the studs and bottom and top plates, and restrained by nail treated softwood battens.

A.7 Once the boards are fitted in place, the nail treated softwood battens will provide a 'stop' to prevent the insulation boards from moving within the stud cavity.

A.8 If no insulated sheathing is used, a vapour control layer should also be installed. This can be provided by vapour check plasterboard or polythene sheeting.

### *Timber-frame with insulated sheathing*

A.9 The product should be fixed to the external surface of the timber-frame structure (outside any OSB or plywood sheathing) and restrained using temporary fixings in the form of large-headed galvanized clout nails, prior to being tied into the brickwork with an appropriate timber-frame wall tie. The product must be tightly butted, and any requirements of the timber-frame manufacturer met.

A.10 The outer leaf of brickwork may be constructed in the conventional manner using appropriate wall ties to restrain the two wall skins together. The ties should be inserted whilst constructing the outer leaf, ensuring a slight offset is achieved, sloping the tie downwards towards the outer leaf.

### *Steel-frame with insulated sheathing*

A.11 Similarly fixed as for timber-frame, the product should be restrained to the outside of the steel-frame construction, ensuring vertical board joints coincide with a vertical member. Fixings should be in accordance with the steel-frame manufacturer's recommendations.

A.12 Advice should also be sought from the appropriate steel-frame manufacturer for recommendations for suitable wall tie specifications, but such advice is outside of the scope of this Certificate.

## 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 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 7671 : 2018 + A2 : 2022 *Requirements for Electrical Installations — IET Wiring Regulations*
- BS 8000-3 : 2020 *Workmanship on building sites — Code of practice for masonry*
- BS EN 351-1 : 2023 *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 845-1 : 2013 + A1 : 2016 *Specification for ancillary components for masonry — Wall ties, tension straps, hangers and brackets*
- BS EN 1604 : 2013 *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 dimensional short term water absorption by partial immersion*
- BS EN 1993-1-2 : 2005 *Eurocode 3 : Design of steel structures — General rules — Structural fire design*  
NA to BS EN 1993-1-2 : 2005 *UK National Annex to Eurocode 3 — Design of steel structures — General rules — Structural fire design*
- BS EN 1993-1-3 : 2006 *Eurocode 3 : Design of steel structures — General rules — Supplementary rules for cold-formed members and sheeting*  
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- BS EN 1995-1-1 : 2004 + A2 : 2014 *Eurocode 5 : Design of timber structures — General — Common rules and rules for buildings*  
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- BS EN 1996-1-1 : 2005 + A1 : 2012 *Eurocode 6 : Design of masonry structures — General rules for reinforced and unreinforced masonry structures*  
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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 12086 : 1997 *Thermal insulating products for building applications — Determination of water vapour transmission properties*
- BS EN 13165 : 2012 + A2 : 2016 *Thermal insulation products for buildings — Factory made rigid polyurethane foam (PU) products — Specification*
- BS EN 13501-1 : 2007 + A1 : 2009 *Fire classification of construction products and building elements — Classification using test data from reaction to fire tests*

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

BS EN 15976 : 2011 *Flexible sheets for waterproofing — Determination of emissivity*

BS EN ISO 6946 : 2017 *Building components and building elements — Thermal resistance and thermal transmittance — Calculation method*

BS EN ISO 9001 : 2015 *Quality management systems — Requirements*

BS EN ISO 14001 : 2015 *Environmental management systems — Requirements with guidance for use*



## Conditions of Certificate

### Conditions

1 This Certificate:

- relates only to the product that is named and described on the front page
- is issued only to the company, firm, organisation or person named on the front page – no other company, firm, organisation or person may hold or claim that this Certificate has been issued to them
- is valid only within the UK
- has to be read, considered and used as a whole document – it may be misleading and will be incomplete to be selective
- is copyright of the BBA
- is subject to English Law.

2 Publications, documents, specifications, legislation, regulations, standards and the like referenced in this Certificate are those that were current and/or deemed relevant by the BBA at the date of issue or reissue of this Certificate.

3 This Certificate will be displayed on the BBA website, and the Certificate Holder is entitled to use the Certificate and Certificate logo, provided that the product and its manufacture and/or fabrication, including all related and relevant parts and processes thereof:

- are maintained at or above the levels which have been assessed and found to be satisfactory by the BBA
- continue to be checked as and when deemed appropriate by the BBA under arrangements that it will determine
- are reviewed by the BBA as and when it considers appropriate.

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

5 In issuing this Certificate the BBA is not responsible and is excluded from any liability to any company, firm, organisation or person, for any matters arising directly or indirectly from:

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

6 Any information relating to the manufacture, supply, installation, use, maintenance and removal of this product which is contained or referred to in this Certificate is the minimum required to be met when the product is manufactured, supplied, installed, used, maintained and removed. It does not purport in any way to restate the requirements of the Health and Safety at Work etc. Act 1974, or of any other statutory, common law or other duty which may exist at the date of issue or reissue of this Certificate; nor is conformity with such information to be taken as satisfying the requirements of the 1974 Act or of any statutory, common law or other duty of care.

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