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Agrément Certificate

14/5111

Product Sheet 1

PITTSBURGH CORNING (UK) – PERINSUL HL

PERINSUL HL

This Agrément Certificate Product Sheet⁽¹⁾ relates to Perinsul HL, a thermally insulating and loadbearing block made of cellular glass, with a bitumen/paper liner on the top and bottom faces. The product is for use in openings and junctions, in protected masonry elements at the base of timber frame walls, and at window and door sills to reduce thermal bridging in domestic and non-domestic buildings.

(1) Hereinafter referred to as 'Certificate'.

CERTIFICATION INCLUDES:

- factors relating to compliance with Building Regulations where applicable
- factors relating to additional non-regulatory information where applicable
- independently verified technical specification
- assessment criteria and technical investigations
- design considerations
- installation guidance
- regular surveillance of production
- formal three-yearly review.



KEY FACTORS ASSESSED

Strength and stability — the product has a compressive strength of $\geq 2.9 \text{ N}\cdot\text{mm}^{-2}$ and is suitable for use in the situations detailed in this Certificate (see section 6).

Thermal performance — the product will reduce linear heat loss ψ -values (psi) at floor/external wall junctions. The product has a thermal conductivity (λ_D) of $0.058 \text{ W}\cdot\text{m}^{-1}\cdot\text{K}^{-1}$ (see section 7).

Behaviour in relation to fire — the core of the product has a Class A1 rating to BS EN 13501-1 : 2018 and its use is unrestricted (see section 8).

Resistance to moisture — the product has satisfactory resistance to moisture (see section 9).

Durability — the product will have adequate durability and will have a life equal to that of the wall in which it is installed (see section 12).



The BBA has awarded this Certificate to the company named above for the product described herein. This product has been assessed by the BBA as being fit for its intended use provided it is installed, used and maintained as set out in this Certificate.

On behalf of the British Board of Agrément

Date of Third issue: 13 December 2019

Originally certificated on 21 February 2015

Brian Moore
Director

The BBA is a UKAS accredited certification body – Number 113.

*The schedule of the current scope of accreditation for product certification is available in pdf format via the UKAS link on the BBA website at www.bbacerts.co.uk
Readers MUST check the validity and latest issue number of this Agrément Certificate by either referring to the BBA website or contacting the BBA directly.*

Any photographs are for illustrative purposes only, do not constitute advice and should not be relied upon.

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Regulations

In the opinion of the BBA, Perinsul HL, if installed, used and maintained in accordance with this Certificate, can satisfy or contribute to satisfying the relevant requirements of the following Building Regulations (the presence of a UK map indicates that the subject is related to the Building Regulations in the region or regions of the UK depicted):



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

Requirement:	A1	Loading
Comment:	The product can contribute to satisfying this Requirement. See section 6 of this Certificate.	
Requirement:	C2(c)	Resistance to moisture
Comment:	The product can contribute to satisfying this Requirement. See section 10 of this Certificate.	
Requirement:	L1(a)(i)	Conservation of fuel and power
Comment:	The product reduces junction psi values. See section 7 of this Certificate.	
Regulation:	7	Materials and workmanship (applicable to Wales only)
Regulation:	7(1)	Materials and workmanship (applicable to England only)
Comment:	The product is acceptable. See section 12 and the <i>Installation</i> part of this Certificate.	
Regulation:	26	CO₂ emission rates for new buildings
Regulation:	26A	Fabric energy efficiency rates for new dwellings (applicable to England only)
Regulation:	26A	Primary energy consumption rates for new buildings (applicable to Wales only)
Regulation:	26B	Fabric performance values for new dwellings (applicable to Wales only)
Comment:	The product can contribute to satisfying these Regulations. See section 7 of this Certificate.	



The Building (Scotland) Regulations 2004 (as amended)

Regulation:	8(1)	Durability, workmanship and fitness of materials
Comment:	The product is acceptable. See sections 11 and 12 and the <i>Installation</i> part of this Certificate.	
Regulation:	9	Building standards applicable to construction
Standard:	1.1(a)(b)	Structure
Comment:	The product can contribute to satisfying this Standard, with reference to clauses 1.1.2 ⁽¹⁾⁽²⁾ and 1.1.3 ⁽¹⁾⁽²⁾ . See section 6 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⁾ , 3.15.4 ⁽¹⁾ and 3.15.5 ⁽¹⁾⁽²⁾ . See section 10 of this Certificate.	
Standard:	6.1(b)	Carbon dioxide emissions
Standard:	6.2	Building insulation envelope
Comment:	The product significantly reduces external wall/floor junction psi values, with reference to clauses 6.1.1 ⁽¹⁾ , 6.1.3 ⁽²⁾ , 6.1.6 ⁽¹⁾ , 6.2.1 ⁽¹⁾⁽²⁾ , 6.2.3 ⁽¹⁾ and 6.2.5 ⁽²⁾ , provided the construction is in accordance with a solution detailed in section 7 of this Certificate.	
Regulation:	12	Building standards applicable to conversions
Comment:	All comments given for this 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	Fitness of materials and workmanship
Comment:		The product is acceptable. See section 12 and the <i>Installation</i> part of this Certificate.
Regulation:	30(a)	Stability
Comment:		The product can contribute to satisfying this Regulation. See section 6 of this Certificate.
Regulation:	39(a)(i)	Conservation measures
Regulation:	40(2)	Target carbon dioxide emission rate
Comment:		The product can contribute to satisfying these Regulations. See section 7 of this Certificate.

Construction (Design and Management) Regulations 2015

Construction (Design and Management) Regulations (Northern Ireland) 2016

In the opinion of the BBA, there is no information in this Certificate which relates to the obligations of the client, designer (including Principal Designer) and contractor (including Principal Contractor) under these Regulations.

Additional Information

NHBC Standards 2019

In the opinion of the BBA, Perinsul HL, 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 6.1 *External masonry walls*, 6.2 *External timber framed walls* and 6.3 *Internal walls*.

CE marking

The Certificate holder has taken the responsibility of CE marking the product in accordance with EAD 170018-00-0305.

Constructive Details Ltd

The product described in this Certificate has been included in an assessment of thermal bridging details from Constructive Details Ltd (CDL). Handbook 5, containing these details, is free to download from CDL at www.constructivedetails.co.uk (see section 7.2 and Figures 1 and 2 of this Certificate).

Technical Specification

1 Description

1.1 Perinsul HL is a thermal break block made from cellular glass with a bitumen/paper liner. The product is designed to be incorporated into masonry walls, door and window sills and timber frame walls to assure their stability, and reduce heat loss and the risk of condensation and mould growth.

1.2 The product is supplied in the sizes detailed in Table 1.

Table 1 Nominal characteristics

Thickness (mm)	Width (mm)	Length (mm)
65	100	450
65	140	450
65	215	450
100	100	450
100	140	450
100	215	450
140	140	450
140	215	450

2 Manufacture

2.1 The product is manufactured mainly (minimum 60%) from recycled glass. The raw materials are ground to a fine powder and heated. Inside the glass, millions of sealed glass cells are formed, producing a material with a cellular structure. After cutting to size, a paper finishing layer is applied to the top and bottom faces.

2.2 As part of the assessment and ongoing surveillance of product quality, the BBA has:

- agreed with the manufacturer the quality control procedures and product testing to be undertaken
- assessed and agreed the quality control operated over batches of incoming materials
- monitored the production process and verified that it is in accordance with the documented process
- evaluated the process for management of nonconformities
- checked that equipment has been properly tested and calibrated
- undertaken to carry out the above measures on a regular basis through a surveillance process, to verify that the specifications and quality control operated by the manufacturer are being maintained.

2.3 The management system of the manufacturer has been assessed and registered as meeting the requirements of BS EN ISO 9001 : 2015 by the BCCA (Certificate BQ 100-585-1831).

3 Delivery and site handling

The product is packaged in cardboard boxes, stored on pallets and shrink wrapped.

Assessment and Technical Investigations

The following is a summary of the assessment and technical investigations carried out on Perinsul HL.

Design Considerations

4 General

Perinsul HL is suitable for use at construction junctions within protected elements, above or below the damp-proof course (dpc) in masonry, or at the base of timber frame walls, to minimise the heat flux at junctions. The product must be protected from mechanical damage and contact with soil or ground and surface water.

5 Practicability of installation

The product is designed to be installed by a competent general builder, or a contractor, experienced with this type of product.

6 Strength and stability



6.1 Compressive design strengths of the walls incorporating the thermal block should be calculated in accordance with BS EN 1996-1-1 : 2005, BS EN 1996-2 : 2006 and BS EN 1996-3 : 2006.

6.2 For design of domestic buildings of up to three storeys, the guidance given in BS 8103-2 : 2013 should be used.

6.3 The declared mean compressive strength of the product is $\geq 2.9 \text{ N}\cdot\text{mm}^{-2}$ when tested in accordance with BS EN 772-1 : 2011. Perinsul HL is a Category II masonry unit as defined in BS EN 1996-1-1 : 2005.

6.4 The characteristic compressive strength of the masonry with the product included⁽¹⁾ is $\geq 1.5 \text{ N}\cdot\text{mm}^{-2}$ when tested in accordance with BS EN 1052-1 : 1999.

(1) Assumes the masonry unit or mortar has a compressive strength of $2.9 \text{ N}\cdot\text{mm}^{-2}$.

6.5 Compressive creep tests indicate that at a load of $0.8 \text{ N}\cdot\text{mm}^{-2}$, the total predicted compressive creep of the product's design life will be less than 2.3% when tested in accordance with BS EN 1606 : 2013.

6.6 The characteristic initial shear strength of the masonry with the product included⁽¹⁾ is $\geq 0.13 \text{ N}\cdot\text{mm}^{-2}$ when tested in accordance with BS EN 1052-3 : 2002.

(1) Assumes the masonry unit or mortar has a compressive strength of $2.9 \text{ N}\cdot\text{mm}^{-2}$.

6.7 For design purposes, the resistance of the product may be taken as $0.8 \text{ N}\cdot\text{mm}^{-2}$ (eg for a 100 mm wide block, this equates to $80 \text{ kN}\cdot\text{m}^{-1}$).

7 Thermal performance



7.1 The product limits the heat loss around the junction between an external wall and a floor by enhancing insulation continuity through the junction. The product has a thermal conductivity (λ_D) of $0.058 \text{ W}\cdot\text{m}^{-1}\cdot\text{K}^{-1}$ in accordance with BS EN 1745 : 2012.

7.2 The ψ -value of any junction incorporating the product will vary depending on the construction. See Tables 2, 3 and 4 for example constructions and ψ -values.

Table 2 Example floor⁽¹⁾ / masonry wall junction psi value

Inner leaf block conductivity ($\text{W}\cdot\text{m}^{-1}\cdot\text{K}^{-1}$)	Wall U value ⁽²⁾⁽³⁾ less than or equal to $0.20 \text{ W}\cdot\text{m}^{-2}\cdot\text{K}^{-1}$	
	ψ -value ($\text{W}\cdot\text{m}^{-1}\cdot\text{K}^{-1}$)	Temperature factor
0.19	0.093	0.95
0.57	0.105	0.94
1.13	0.117	0.93

(1) Floor value between 0.12 and $0.19 \text{ W}\cdot\text{m}^{-2}\cdot\text{K}^{-1}$ for a perimeter/area (P/A) ratio of 0.25 (see Table 3 for U values for additional P/A ratios).

(2) The floor U values for the range shown can be achieved with insulation thicknesses between 50 and 125 mm, and with $\lambda \leq 0.023 \text{ W}\cdot\text{m}^{-1}\cdot\text{K}^{-1}$.

(3) The detail for this example is shown in Figure 1 of this Certificate.

Table 3 U values for the same floor construction for various P/A ratios

P/A ($\text{m}\cdot\text{m}^{-2}$)	0.20	0.25	0.30	0.35	0.40	0.45	0.50	0.55	0.60	0.65	0.70	0.75	0.80	0.85	0.90	0.95	1.00
U value ($\text{W}\cdot\text{m}^{-2}\cdot\text{K}^{-1}$)	0.18	0.19	0.21	0.22	0.23	0.23	0.24	0.25	0.25	0.26	0.26	0.27	0.27	0.28	0.28	0.28	0.28

(The ψ -value can only be used when the actual floor U value is less than that given for the P/A ratios relevant to the dwelling in question.)

Table 4 Example masonry wall / flat roof junction psi value

Inner leaf block conductivity (W·m ⁻¹ ·K ⁻¹)	Wall U value ⁽¹⁾ less than or equal to 0.20 W·m ⁻² ·K ⁻¹	
	ψ-value (W·m ⁻¹ ·K ⁻¹)	Temperature factor
0.19	0.078	0.95
0.57	0.103	0.93
1.13	0.121	0.93

(1) The detail for this example is shown in Figure 2 of this Certificate.

Table 5 Example floor⁽¹⁾ / timber wall junction psi value

Wall U value ⁽²⁾⁽³⁾⁽⁴⁾ of 0.25 W·m ⁻² ·K ⁻¹	
ψ-value (W·m ⁻¹ ·K ⁻¹)	Temperature factor
0.070	0.79

- (1) Slab on ground floor U Value of 0.25 W·m⁻²·K⁻¹ at a P/A ratio of 0.25. Build up as follows (external to internal): 150 mm concrete slab ($\lambda = 2.5 \text{ W}\cdot\text{m}^{-1}\cdot\text{K}^{-1}$), 80 mm Foamglas floor board insulation ($\lambda = 0.041 \text{ W}\cdot\text{m}^{-1}\cdot\text{K}^{-1}$), 70 mm screed ($\lambda = 1.15 \text{ W}\cdot\text{m}^{-1}\cdot\text{K}^{-1}$).
- (2) Wall U Value of 0.25 W·m⁻²·K⁻¹ with the following build-up (external to internal): 100 mm brickwork ($\lambda = 0.77 \text{ W}\cdot\text{m}^{-1}\cdot\text{K}^{-1}$), 50 mm vented cavity ($R = 0.18 \text{ m}^2 \text{ K}\cdot\text{W}^{-1}$), 140 mm timber frame filled with mineral wool ($\lambda = 0.040 \text{ W}\cdot\text{m}^{-1}\cdot\text{K}^{-1}$), 12.5 mm plasterboard ($\lambda = 0.25 \text{ W}\cdot\text{m}^{-1}\cdot\text{K}^{-1}$).
- (3) The detail for this example is shown in Figure 3 of this Certificate. The junction includes the Perinsul HL block (140 by 140 by 450 mm, on a 140 by 40 mm timber plate, both held in place by L-shaped steel fixing straps at 600 mm centres along the junction).
- (4) Results for other constructions will differ and should be calculated in accordance with BS EN 10211 : 2013 and BRE Report BR 497 : 2007.

8 Behaviour in relation to fire

The core material is cellular glass with a fire classification of Class A1 to BS EN 13501-1 : 2018 and its use is not subject to any restriction on building height or proximity to boundaries.

9 Resistance to moisture

9.1 The product should be used in conjunction with a conventional dpc in accordance with BS 8215 : 1991 and the relevant clauses of BS 8000-4 : 1989.

9.2 The long-term water absorption of the product is $\leq 0.5 \text{ kg}\cdot\text{m}^{-3}$ when tested in accordance with BS EN 12087 : 2013.

9.3 The water vapour resistance of the product when tested in accordance with BS EN 12086 : 2013 has a factor (μ) of infinity.

9.4 The product's ability to resist rain ingress as part of a wall construction has not been assessed and it should only be used in protected constructions not exposed to the elements.

10 Condensation



The product installed in a wall/floor junction or wall/roof junction (shown in Figures 1 and 2) and maintaining the insulation continuity can achieve temperature factors exceeding the values given in BRE information Paper IP 1/06, and will adequately limit the risk of surface condensation.

11 Maintenance



As the product is confined and has suitable durability (see section 12), maintenance is not required.

12 Durability



The product has adequate durability and will have a life equal to that of the wall in which it is installed. The design life for masonry walls designed in accordance with BS EN 1996-1-1 : 2005 is 60 years.

Installation

13 General

The level of supervision during installation of the block and the associated structure must be sufficient to satisfy the requirements of BS EN 1996-1-1 : 2005, BS EN 1996-2 : 2006 and BS 8000-3 : 2001.

14 Procedure

14.1 Perinsul HL blocks are laid as for conventional masonry onto a horizontal mortar bed, with the exception that perpend joints are dry butted, without mortar.

Masonry walls

14.2 The product should be installed in accordance with the installation requirements of the manufacturer and conventional good practice for building masonry walls, including the provision of movement joints where these would normally be required.

Figure 1 Concrete ground-bearing floor – insulation below slab

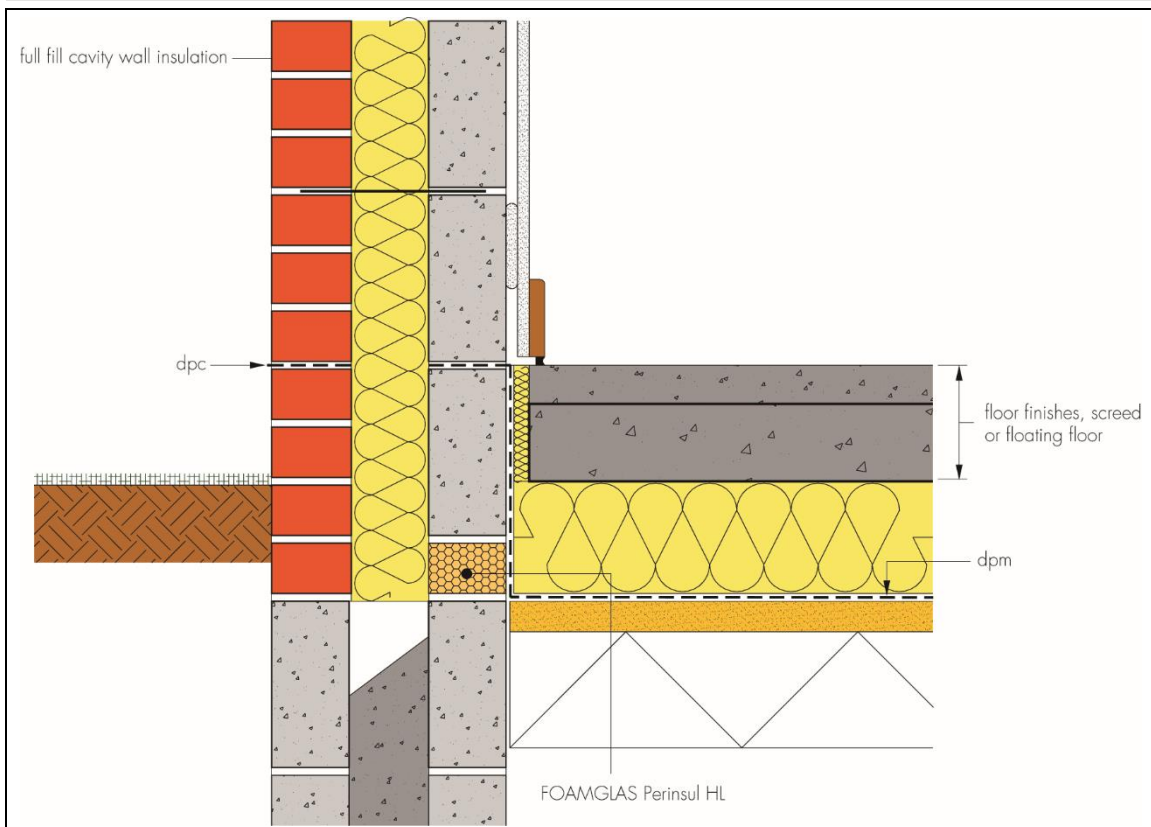
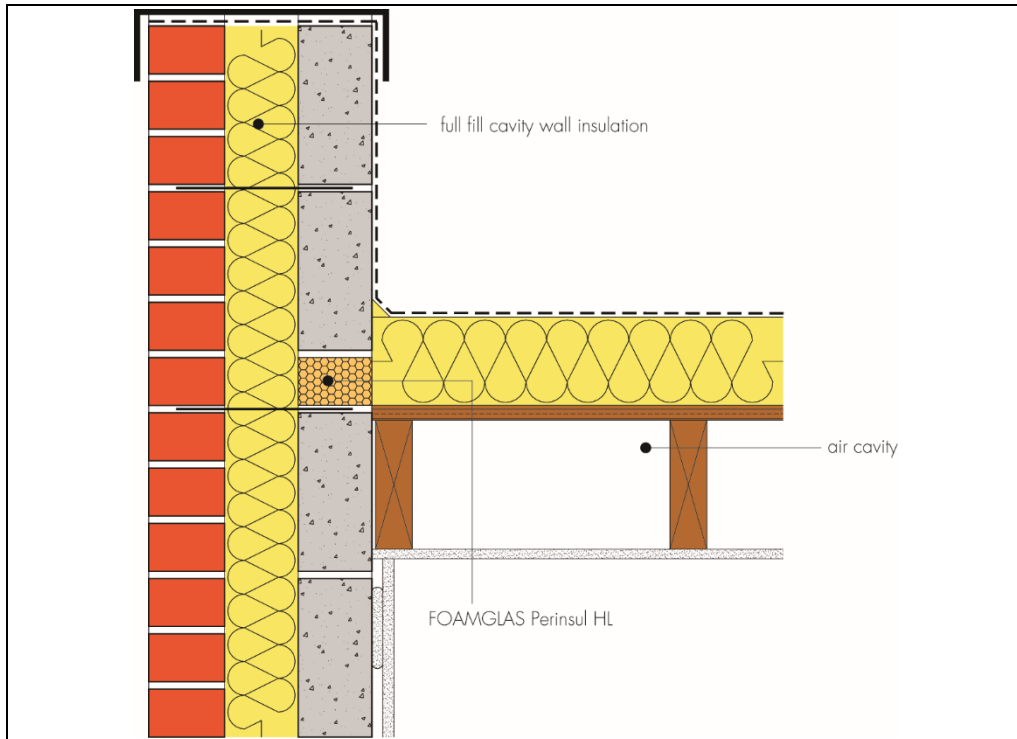


Figure 2 Flat roof with parapet and warm deck — insulation above joists



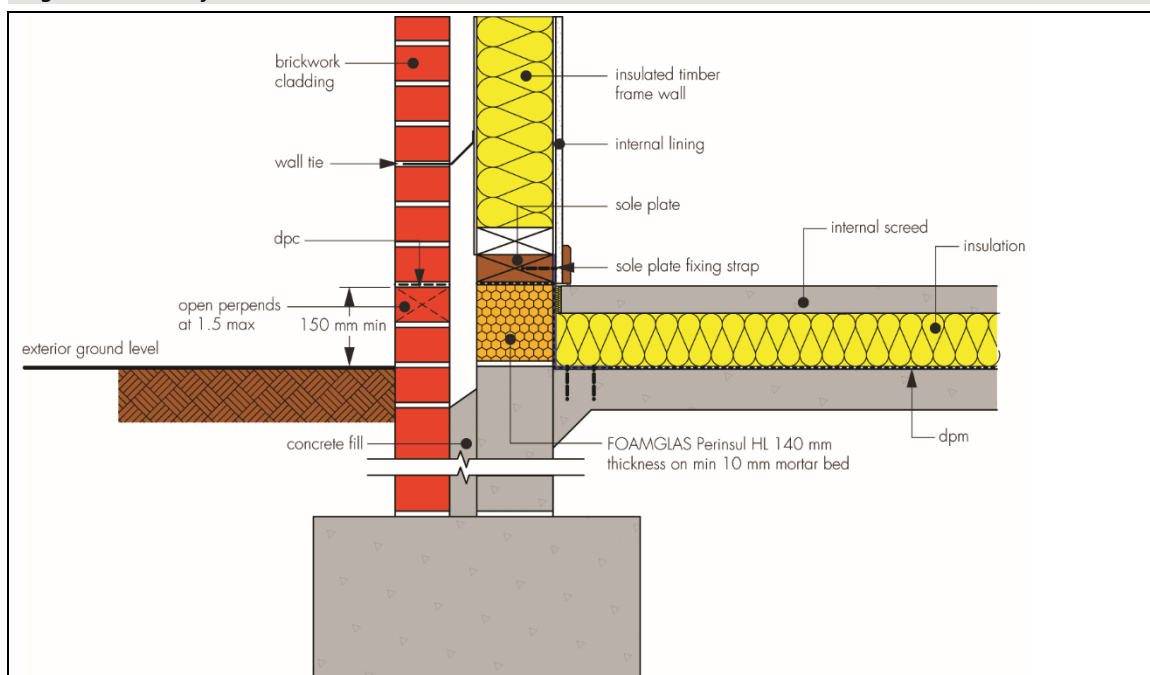
Timber frame walls

14.3 The product is laid level and true onto a bed of soft mortar; the level is checked again before the mortar sets. A dpc is laid over the product. Packing beneath the sole plate is not required, the level upper surface of the product becoming the starting point for laying the sole plate and hence setting out the timber frame.

14.4 Fixings do not pass through the product as the sole plate is secured using a strap fixing. One end of the strap is fixed to the vertical inner face of the timber sole plate, the other is bent through 90 degrees and secured to the horizontal structural floor. Fixing strap design, fixing type and fixing centres must be specified in the timber frame engineer's calculations.

14.5 The sole plate should be treated with a suitable timber preservative prior to construction.

Figure 3 Timber frame wall



Window and door sills

14.6 When the product is to be installed under windows or door seals, a separate supporting board (eg fibre cement board) must be used over the product in order to prevent point loads. A full mortar bed must be used when placing window and door sills on the supporting board.

Technical Investigations

15 Investigations

15.1 The manufacturing process was evaluated, including the methods adopted for quality control, and details were obtained of the quality and composition of materials used.

15.2 An examination of data was made relating to:

- thermal resistance
- compressive strength
- water absorption
- dimensional stability
- shear strength
- loading behaviour
- resistance to mould
- resistance to vermin
- resistance to fire.

Bibliography

BRE Report BR 497 : 2007 *Conventions for calculating linear thermal transmittance and temperature factors*

BRE Information Paper IP 1/06 *Assessing the effects of thermal bridging at junctions and around openings*

BS 8215 : 1991 *Code of practice for design and installation of damp-proof courses in masonry construction*

BS 8000-3 : 2001 *Workmanship on building sites — Code of practice for masonry*

BS 8000-4 : 1989 *Workmanship on building sites — Code of practice for waterproofing*

BS 8103-2 : 2013 *Structural design of low-rise buildings — Code of practice for masonry walls for housing*

BS EN 772-1 : 2011 + A1 : 2015 *Methods of test for masonry units — Determination of compressive strength*

BS EN 1052-1 : 1999 *Methods of test for masonry — Determination of compressive strength*

BS EN 1052-3 : 2002 *Methods of test for masonry — Determination of initial shear strength*

BS EN 1606 : 2013 *Thermal Insulating Products for Building Applications — Determination of Compressive Creep*

BS EN 1745 : 2012 *Masonry and masonry products — Methods for determining thermal properties*

BS EN 1996-1-1 : 2005 *Eurocode 6 : Design of masonry structures — General rules for reinforced and unreinforced masonry structures*

BS EN 1996-2 : 2006 *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*

BS EN 10211 : 2013 *Chemical analysis of ferrous materials — Determination of titanium in steels and cast irons — Flame atomic absorption spectrometric method*

BS EN 12086 : 2013 *Thermal Insulating Products for Building Applications — Determination of Water Vapour Transmission Properties*

BS EN 12087 : 2013 *Thermal insulating products for building applications — Determination of long term water absorption by immersion*

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

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

EAD 170018-00-0305 *Thermally-insulating and loadbearing units made of cellular glass*

16 Conditions

16.1 This Certificate:

- relates only to the product/system that is named and described on the front page
- is issued only to the company, firm, organisation or person named on the front page – no other company, firm, organisation or person may hold 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.

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

16.3 This Certificate will remain valid for an unlimited period provided that the product/system and its manufacture and/or fabrication, including all related and relevant parts and processes thereof:

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

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

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

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

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