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Agrément Certificate  
**14/5111**  
Product Sheet 1

## PITTSBURGH CORNING (UK) – PERINSUL HL

### PERINSUL HL

This Agrément Certificate Product Sheet<sup>(1)</sup> 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

**Thermal performance** — the product will reduce linear heat loss  $\psi$ -values (psi) at floor/external wall junctions. The product has a thermal conductivity ( $\lambda_D$ ) of  $0.058 \text{ W}\cdot\text{m}^{-1}\cdot\text{K}^{-1}$  (see section 6).

**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 7).

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

**Behaviour in relation to fire** — the core of the product has a Class A1 rating to EN 13501-1 : 2007 (see section 10).

**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

A handwritten signature in black ink, appearing to read 'John Albon'.

Date of Second issue: 21 September 2016

John Albon — Head of Approvals  
Construction Products

A handwritten signature in black ink, appearing to read 'Claire Curtis-Thomas'.

Claire Curtis-Thomas  
Chief Executive

Originally certificated on 21 February 2015

*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](http://www.bbacerts.co.uk)*

*Readers are advised to check the validity and latest issue number of this Agrément Certificate by either referring to the BBA website or contacting the BBA direct.*

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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 7 of this Certificate.   |
| Requirement: | C2(c)    | Resistance to moisture  |
| Comment:     |          | The product can contribute to satisfying this Requirement. See section 8 of this Certificate.   |
| Requirement: | L1(a)(i) | Conservation of fuel and power  |
| Comment:     |          | The product reduces junction psi values. See section 6 of this Certificate.   |
| Regulation:  | 7        | Materials and workmanship   |
| Comment:     |          | The product is an acceptable material. It should be specified and installed in accordance with section 12 and the <i>Installation</i> part of this Certificate. |
| Regulation:  | 26       | CO <sub>2</sub> 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 in Wales only)   |
| Regulation:  | 26B      | Fabric performance values for new dwellings (applicable in Wales only)  |
| Comment:     |          | The product can contribute to satisfying these Regulations. See section 6 of this Certificate.  |



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

|             |           |  |
|-------------|-----------|--|
| Regulation: | 8(1)      | 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 <sup>(1)(2)</sup> and 1.1.3 <sup>(1)(2)</sup> . See section 7 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)</sup> and 3.15.5 <sup>(1)(2)</sup> . See section 8 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 <sup>(1)</sup> , 6.1.3 <sup>(2)</sup> , 6.1.6 <sup>(1)</sup> , 6.2.1 <sup>(1)(2)</sup> , 6.2.3 <sup>(1)</sup> and 6.2.5 <sup>(2)</sup> , provided the construction is in accordance with a solution detailed in section 6 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 <sup>(1)(2)</sup> and Schedule 6 <sup>(1)(2)</sup> .<br>(1) Technical Handbook (Domestic).<br>(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: | 29       | Condensation  |
| Comment:    |          | The product can contribute to satisfying this Regulation. See section 8 of this Certificate.    |
| Regulation: | 30(a)    | Stability   |
| Comment:    |          | The product can contribute to satisfying this Regulation. See section 7 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 6 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) to address their obligations under these Regulations.



## 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 Thermal performance



6.1 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 ( $\lambda_D$ )\* of  $0.058 \text{ W}\cdot\text{m}^{-1}\cdot\text{K}^{-1}$  in accordance with EN 1745 : 2002.

6.2 The  $\psi$ -value (psi) of any junction incorporating the product will vary depending on the construction. See Tables 2, 3 and 4 for example constructions and  $\psi$ -values.

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

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

(1) Floor value between  $0.12 \text{ W}\cdot\text{m}^{-2}\cdot\text{K}^{-1}$  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 mm 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<br>( $\text{m}\cdot\text{m}^{-2}$ )                 | 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<br>( $\text{W}\cdot\text{m}^{-2}\cdot\text{K}^{-1}$ ) | 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  $\psi$ -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<br>( $\text{W}\cdot\text{m}^{-1}\cdot\text{K}^{-1}$ ) | Wall U <sup>(1)</sup> value less than or equal to $0.20 \text{ W}\cdot\text{m}^{-2}\cdot\text{K}^{-1}$ |                    |
|---|--|--------------------|
|   | $\psi$ -value ( $\text{W}\cdot\text{m}^{-1}\cdot\text{K}^{-1}$ )                                       | 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<sup>(1)</sup>/timber wall junction psi value<sup>(3)(4)</sup>

| Wall U value of 0.25 W·m <sup>-2</sup> ·K <sup>-1</sup> |                    |
|---|--------------------|
| ψ-value<br>(W·m <sup>-1</sup> ·K <sup>-1</sup> )        | Temperature factor |
| 0.070   | 0.79               |

- (1) Slab on ground floor U Value of 0.25 W·m<sup>-2</sup>·K<sup>-1</sup> 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<sup>-2</sup>·K<sup>-1</sup> 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 mm by 140 mm by 450 mm, on a 140 mm 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.

## 7 Strength and stability



7.1 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.

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

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

7.4 The characteristic compressive strength\* of the masonry with the product included<sup>(1)</sup> is  $\geq 1.5 \text{ N}\cdot\text{mm}^{-2}$  when tested in accordance with EN 1052-1 : 2009.

7.5 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 EN 1606 : 1996.

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

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

7.7 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  $80 \text{ kN}\cdot\text{m}^{-1}$ ).

## 8 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.

## 9 Resistance to moisture

9.1 The product should be used in conjunction with a conventional dpc in accordance with CP 102 : 1973 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 EN 12087 : 2013.

9.3 The water vapour resistance of the product when tested in accordance with EN 12086 : 2013 has a factor ( $\mu$ ) 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 Behaviour in relation to fire

The core material is cellular glass with a fire classification of Class A1 to EN 13501-1 : 2007.

## 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.

## 13 General

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

## 14 Procedure

14.1 The 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

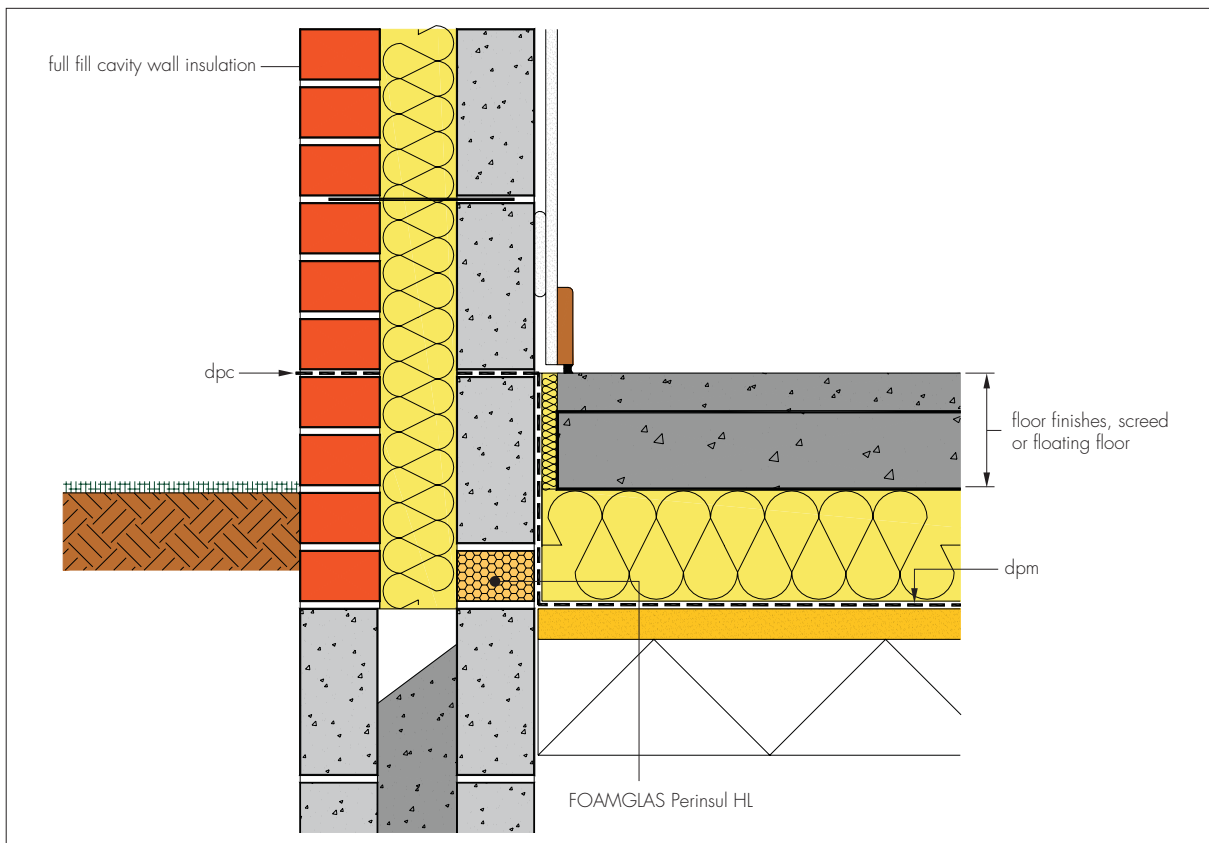
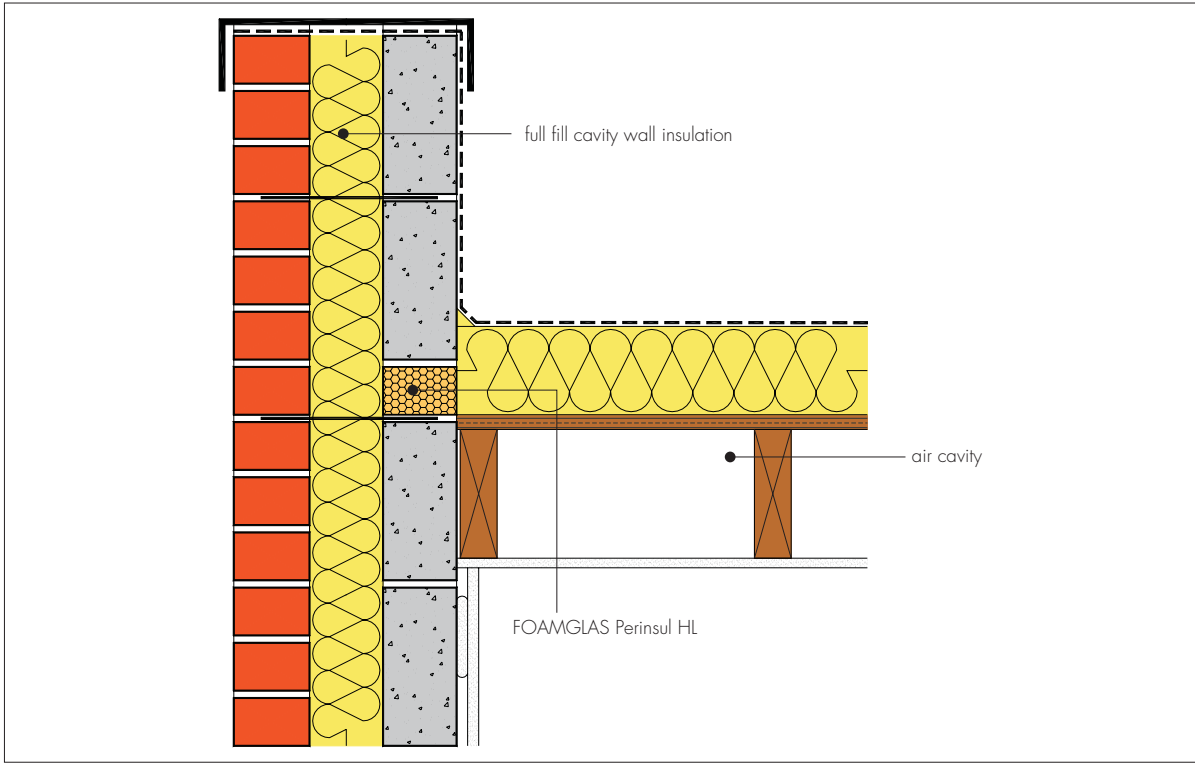


Figure 2 Flat roof with parapet and warmdeck — insulation above joists



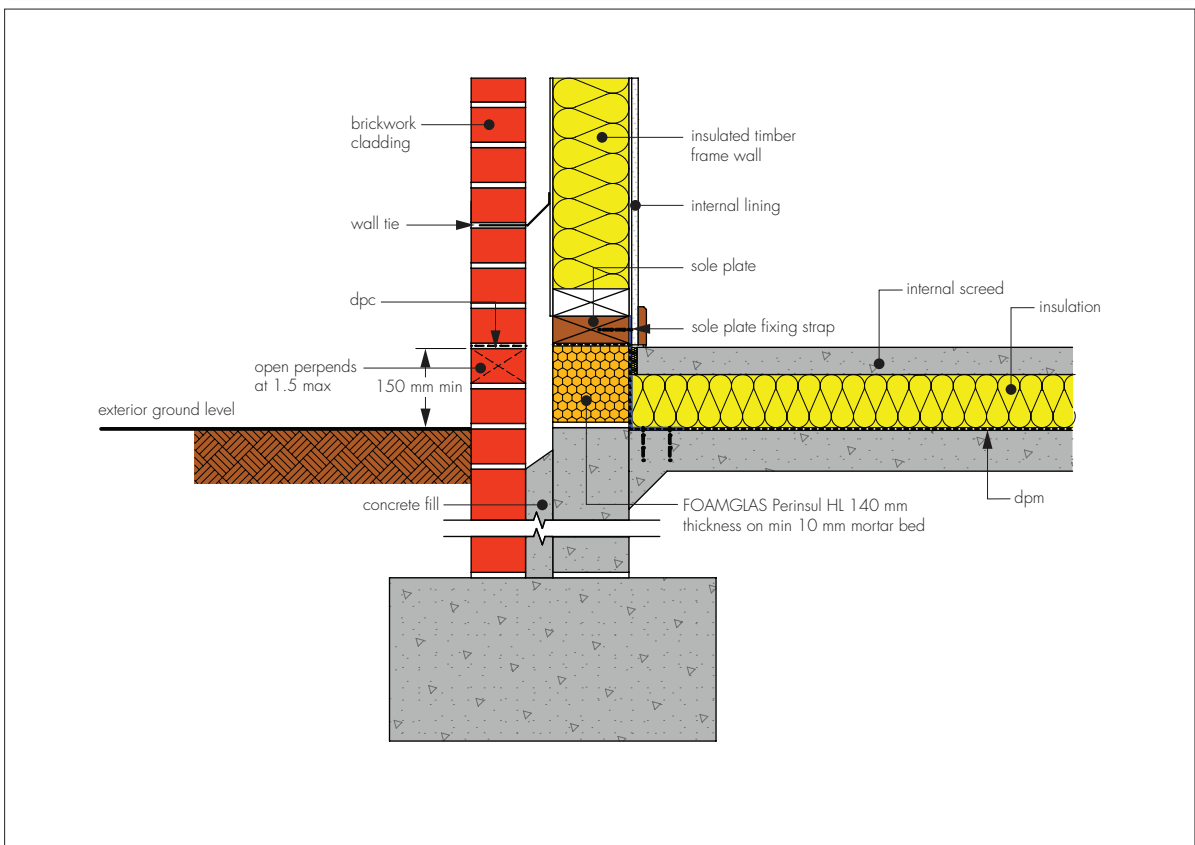
### Timber frame walls

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 datum 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) is to be used over the product in order to prevent point loads. A full mortar bed is to 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
- dimensional stability
- resistance to mould
- compressive strength
- shear strength
- resistance to vermin
- water absorption
- loading behaviour
- resistance to fire.

## Bibliography

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 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 ISO 9001 : 2008 *Quality management systems — Requirements*

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

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*

CP 102 : 1973 *Code of practice for protection of buildings against water from the ground*

CUAP 12.01/40 *Thermal Break made of Cellular Glass, with a bitumen/PE-Liner for masonry walls*

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

EN 1606 : 1996 *Thermal Insulating Products for Building Applications — Determination of Compressive Creep*

EN 1052-1 : 2009 *Methods of Test for Masonry — Determination of Compressive Strength*

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

EN 1745 : 2002 *Masonry and masonry products — Methods for determining thermal properties*

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

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

EN 13501-1 : 2007 *Fire classification of construction products and building elements — Classification using data from reaction to fire tests*



## 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.