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Agrément Certificate

95/3212

Product Sheet 1

KNAUF INSULATION

EARTHWOOL DRITHERM CAVITY SLAB

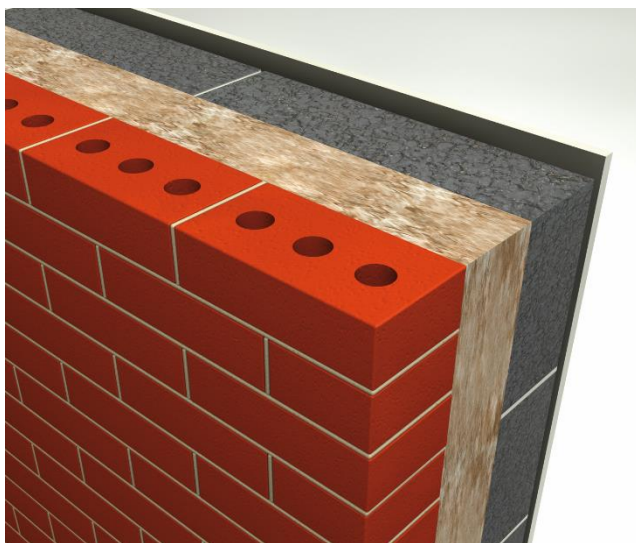
This Agrément Certificate Product Sheet⁽¹⁾ relates to Earthwool DriTherm⁽²⁾ Cavity Slab, a resin-bonded glass mineral wool insulating material in slab form, for use as full- and partial-fill insulation in new and existing domestic and non-domestic buildings. The product is for use in masonry cavity walls up to 25 metres in height (full-fill), or with no height restriction (partial-fill), with a residual cavity of 50 mm.

(1) Hereinafter referred to as 'Certificate'.

(2) Earthwool DriTherm is a registered trademark.

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 has a thermal conductivity (λ_D) of 0.032 to 0.037 W·m⁻¹·K⁻¹ depending on thicknesses and densities (see section 6).

Water resistance— the product will resist water transfer across the cavity (see section 7).

Condensation— the product will contribute to limiting the risk of condensation (see section 8).

Behaviour in relation to fire— the product has a reaction to fire classification of Class A1 in accordance with BS EN 13501-1 : 2007 (see section 9).

Durability— the product is durable, rot-proof, water resistant and sufficiently stable to remain effective as an insulation for the life of the building (see section 11).



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 Sixth issue: 13 December 2016

John Albon – Head of Approvals
Construction Products

Originally certificated on 14 February 1996

Claire Curtis-Thomas
Chief Executive

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 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, Earthwool DriTherm Cavity Slab, 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:	B3(4)	Internal fire spread (structure)
Comment:		The product is unrestricted by this Requirement. See section 9 of this Certificate.
Requirement:	C2(a)	Resistance to moisture
Comment:		The product can contribute to satisfying this Requirement. See section 7.1 of this Certificate.
Requirement:	C2(b)	Resistance to moisture
Comment:		The product can contribute to satisfying this Requirement. See section 7.2 of this Certificate.
Requirement:	C2(c)	Resistance to moisture
Comment:		The product can contribute to satisfying this Requirement. See sections 8.1 and 8.3 of this Certificate.
Requirement:	L1(a)(i)	Conservation of fuel and power
Comment:		The product can contribute to satisfying this Requirement. See section 6 of this Certificate.
Regulation:	7	Materials and workmanship
Comment:		The product is acceptable. See section 11 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 (application to Wales only)
Regulation:	26B	Fabric performance values for new dwellings (applicable to Wales only)
Comment:		The product can contribute to satisfying these Regulations; however, compensating fabric/services measures may need to be taken. 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 section 11 and the <i>Installation</i> part of this Certificate.
Regulation:	9	Building standards applicable to construction
Standard:	2.4	Cavities
Comment:		The product can contribute to satisfying this Standard, with reference to clause 2.2.4 ⁽¹⁾⁽²⁾ . See section 9 of this Certificate.
Standard:	2.6	Spread to neighbouring buildings
Comment:		The product is not non-combustible and its use is unrestricted by this Standard, with reference to clauses 2.6.5 ⁽¹⁾ and 2.6.6 ⁽²⁾ . See section 9 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 ⁽¹⁾⁽²⁾ and 3.4.5 ⁽¹⁾⁽²⁾ . See section 7.1 of this Certificate.
Standard:	3.10	Precipitation
Comment:		The product can contribute to satisfying this Standard, with reference to clauses 3.10.1 ⁽¹⁾⁽²⁾ and 3.10.3 ⁽¹⁾⁽²⁾ . See section 7.2 of this Certificate.

Standard:	3.15	Condensation
Comment:		The product can contribute to satisfying this Standard, with reference to clauses 3.15.1 ⁽¹⁾⁽²⁾ , 3.15.4 ⁽¹⁾⁽²⁾ and 3.15.5 ⁽¹⁾⁽²⁾ . See sections 8.1 and 8.4 of this Certificate.
Standard:	6.1(a)	Carbon dioxide emissions
Standard:	6.2	Building insulation envelope
Comment:		The product can contribute to satisfying clauses, or parts of clauses, 6.1.1 ⁽¹⁾ , 6.1.2 ⁽²⁾ , 6.1.6 ⁽¹⁾ , 6.2.1 ⁽¹⁾⁽²⁾ , 6.2.3 ⁽¹⁾ , 6.2.4 ⁽²⁾ , 6.2.5 ⁽²⁾ , 6.2.9 ⁽¹⁾ , 6.2.10 ⁽¹⁾⁽²⁾ , 6.2.11 ⁽¹⁾⁽²⁾ and 6.2.13 ⁽²⁾ . See section 6 of this Certificate.
Standard:	7.1(a)(b)	Statement of sustainability
Comment:		The product can contribute to satisfying the relevant requirements of Regulation 9, Standards 1 to 6, and therefore will contribute to a construction meeting a bronze level of sustainability as defined in this Standard. In addition, the product can contribute to a construction meeting a higher level of sustainability as defined in this Standard, with reference to clauses 7.1.4 ⁽¹⁾⁽²⁾ [Aspects 1 ⁽¹⁾⁽²⁾ and 2 ⁽¹⁾], 7.1.6 ⁽¹⁾⁽²⁾ [Aspects 1 ⁽¹⁾⁽²⁾ and 2 ⁽¹⁾] and 7.1.7 ⁽¹⁾⁽²⁾ [Aspect 1 ⁽¹⁾⁽²⁾]. See section 6 of this Certificate.
Regulation:	12	Building standards applicable to conversions
Comment:		All comments given for the product under Regulation 9, Standards 1 to 6 also apply to this Regulation, with reference to clause 0.12.1 ⁽¹⁾⁽²⁾ and Schedule 6 ⁽¹⁾⁽²⁾ .

(1) Technical Handbook (Domestic).
(2) Technical Handbook (Non-Domestic).



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

Regulation:	23	Fitness of materials and workmanship
Comment:		The product is acceptable. See section 11 and the <i>Installation</i> part of this Certificate.
Regulation:	28(a)	Resistance to moisture and weather
Comment:		The product can contribute to satisfying this Regulation. See section 7.1 of this Certificate.
Regulation:	28(b)	Resistance to moisture and weather
Comment:		The product can contribute to satisfying this Regulation. See section 7.2 of this Certificate.
Regulation:	29	Condensation
Comment:		The product can contribute to satisfying this Regulation. See section 8.1 of this Certificate.
Regulation:	35(4)	Internal fire spread — structure
Comment:		The product is unrestricted by this Regulation. See section 9 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

Information in this Certificate may assist the client, designer (including Principal Designer) and contractor (including Principal Contractor) to address their obligations under these Regulations.

See section: **3 Delivery and site handling (3.4)** of this Certificate.

Additional Information

NHBC Standards 2016

NHBC accepts the use of Earthwool DriTherm Cavity Slab (where used as full-fill) other than in very severe exposure locations with fair-faced masonry, provided it is installed, used and maintained in accordance with this Certificate, in relation to *NHBC Standards*, Chapter 6.1, *External masonry walls*.

Where used as a partial-fill, and subject to a 50 mm minimum residual cavity being maintained, NHBC accepts the use of Earthwool DriTherm Cavity Slab, provided it is installed, used and maintained in accordance with this Certificate, in relation to *NHBC Standards*, Chapter 6.1, *External masonry walls*.

CE marking

The Certificate holder has taken the responsibility of CE marking the Earthwool DriTherm Cavity Slab in accordance with harmonised European Standard BS EN 13162 : 2012. An asterisk (*) appearing in this Certificate indicates that data shown are given in the manufacturer's Declaration of Performance.

Technical Specification

1 Description

1.1 Earthwool DriTherm Cavity Wall Slab consists of layers of resin-bonded, water-repellent-treated glass mineral wool formed into slabs. They are available in a range of thermal conductivities (see section 6 of this Certificate).

1.2 The product has the nominal characteristics shown in Table 1.

Table 1 Slab characteristics

Length (mm)	1200
Width (mm)	455
Thickness* (mm)	50, 65, 75, 85, 100, 125 and 150

2 Manufacture

2.1 The raw materials are melted in an induction furnace, and the composition of the melted glass maintained at a prescribed chemical composition. The product is produced using Knauf fiberising ECOSE Technology, whereby rapidly-renewable bio-based materials replace the petroleum-based chemicals and eliminate phenol and formaldehyde from the manufacturing process.

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 being operated by the manufacturer are being maintained.

2.3 The management system of Knauf Insulation Ltd has been assessed and registered as meeting the requirements of BS EN ISO 9001 : 2008 by Bureau Veritas Certification (Certificate BE001519-1).

3 Delivery and site handling

3.1 The product is delivered to site in polythene-wrapped packs. Each pack of slabs contains a label with the manufacturer's name, board dimensions and the BBA logo incorporating the number of this Certificate.

3.2 The product must be protected from prolonged exposure to sunlight, and stored dry, flat and raised above ground level (to avoid contact with ground moisture). Where possible, packs should be stored inside. If stored outside, they should be under cover, or protected with opaque polythene sheeting.

3.3 The product is light and easy to handle; care should be exercised to avoid crushing the edges or corners. If damaged, the product should be discarded.

3.4 It is recommended that dust masks, gloves and long-sleeved clothing should be worn during cutting and handling of the product.

3.5 Damaged, contaminated or wet product must not be used.

Assessment and Technical Investigations

The following is a summary of the assessment and technical investigations carried out on Earthwool DriTherm Cavity Slab.

Design Considerations

4 General

4.1 Earthwool DriTherm Cavity Slab is satisfactory for use as partial- and full-fill cavity wall insulation and is effective in reducing the thermal transmittance (U value) of cavity walls with masonry inner and outer leaves (as shown in Figure 1), where masonry includes clay and calcium silicate bricks, concrete blocks, and natural and reconstituted stone blocks.

4.2 The product is for use in new and existing domestic and non-domestic buildings, without height restriction for partial-fill and up to 25 m for full-fill. (For both partial- and full-fill applications, additional requirements apply above 12 m.) It is essential that walls are designed and constructed to incorporate the precautions given in this Certificate to prevent moisture penetration.

4.3 Buildings subject to the national Building Regulations should be constructed in accordance with the relevant recommendations of:

- BS 8000-3 : 2001
- BS EN 1996-1-1 : 2005, BS EN 1996-1-2 : 2005, BS EN 1996-2 : 2006 and BS EN 1996-3 : 2006 and their respective UK National Annexes
- BS EN 845-1 : 2013.

4.4 Other buildings not subject to these Regulations should also be built in accordance with the Standards given in section 4.3 of this Certificate.

4.5 The use of cavity battens and/or boards during construction is strongly recommended to prevent bridging by mortar droppings.

4.6 It is recommended that installation is continuous up to the highest level on each wall. If it is terminated at any other level, the top edge of the insulation must be protected by a cavity tray with stopends and weepholes at alternate perpend (full-fill). The cavity must be capped in brick, block or suitable board material (partial-fill).

4.7 With the exception of NHBC's restrictions relating to usage in very severe exposure locations with fair-faced masonry (for partial-fill) and subject to the conditions set out in this Certificate being met, the product is for use in any exposure zone. However, the use of the product does not preclude the need to apply any external render coat or other suitable finish in severe exposure zones where such applications would be normal practice.

4.8 Cavity wall ties with insulation-retaining fixings and, if required, any additional ties to BS EN 845-1 : 2013 and PD 6697 : 2010 should 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.

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

- cavity wall ties are installed correctly, are thoroughly clean and slope downwards towards the outer face of the construction
- 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 slabs
- insulation slabs are properly installed and butt-jointed
- installation is carried out to the highest level on each wall, or the top edge of the insulation is protected by a cavity tray
- at lintel level, a cavity tray, stopends and weepholes are provided
- cavity battens and/or boards are used during construction to prevent bridging by mortar droppings
- damp-proof course (dpc) membranes at ground level do 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.

Full-fill use

Buildings up to and including 12 m in height

4.10 The design conditions to be followed are:

- that the insulation completely fills the cavity
- that the insulation thickness should remain constant where possible. Should any change in vertical thickness occur, a horizontal damp-proof cavity tray should separate each thickness change
- that a minimum thickness of 50 mm be maintained where possible. Where, for structural reasons, the insulation thickness is reduced, eg by the intrusion of ring beams, a minimum thickness of 25 mm insulation should be maintained and the manufacturer's advice on fixing and weatherproofing sought.

Buildings over 12 m high and up to and including 25 m high

4.11 Where the walls of a building are between 12 and 25 m high, the following requirements also apply:

- from ground level, the maximum height of continuous cavity must not exceed 12 m. Above 12 m, the maximum height of continuous cavity must not exceed 7 m
- the area to be insulated must not be an infill panel in a framed structure
- the Certificate holder, in association with the architect, shall carry out a detailed programme of assessment of the project including an examination of the quality of installation as work progresses. Above average site supervision is recommended during installation
- Certification relates only to buildings where the Certificate holder has given written approval for use of the product on the specified building.

Partial-fill use

Buildings up to and including 12 m high

4.12 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 50 mm residual cavity width is required by the NHBC). 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 slabs), 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, or the limitations in respect of exposure of the proposed building as set out in Table 2 must also be observed.

Table 2 Maximum allowable total exposure factors of different constructions

Construction	Maximum allowable exposure factor E ⁽¹⁾
All external masonry walls protected by rendering (to BS EN 13914-1); 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 weather struck	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.

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

Buildings over 12 m in height

4.14 Where the walls of the building are above 12 m in height, the following requirements also apply:

- 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
- the specifier must take extra care when detailing to ensure that the introduction of the insulation does not affect the weather resistance of the wall. Above average site supervision is recommended during installation of the product
- where, for structural reasons, the cavity width is reduced, extra care must be taken with fixings and weatherproofing (eg the inclusion of cavity trays with weepholes).

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 Calculations of thermal transmittance (U value) should be carried out in accordance with BS EN ISO 6946 : 2007 and BRE Report BR 443 : 2006, using the thermal conductivities (λ_D value) from Table 3.

Table 3 Declared thermal conductivity

Product	Thickness (mm)	Declared thermal conductivity W·m ⁻¹ ·K ⁻¹
Earthwool DriTherm Cavity Slab 37 Standard	75-150	0.037
	65	0.036
	50	0.035
Earthwool DriTherm Cavity Slab 34 Super	75-150	0.034
Earthwool DriTherm Cavity Slab 32 Ultimate	75-150	0.032

6.2 The U value of a typical brick and block cavity wall construction will depend on the cavity width and the insulating value of the internal block leaf finish. Calculated U values for sample constructions are given in Tables 4 and 5 of this Certificate.

Table 4 Example cavity wall U values⁽¹⁾ — full-fill construction

U value requirement ($W \cdot m^{-2} \cdot K^{-1}$) ⁽¹⁾	Insulation thickness (mm) ⁽²⁾					
	13 mm dense plaster ⁽³⁾ 100 mm dense block ⁽⁵⁾			Plasterboard on dabs ⁽⁴⁾ 100 mm AAC block ⁽⁶⁾		
	$\lambda_D = 0.037$ $W \cdot m^{-1} \cdot K^{-1}$	$\lambda_D = 0.034$ $W \cdot m^{-1} \cdot K^{-1}$	$\lambda_D = 0.032$ $W \cdot m^{-1} \cdot K^{-1}$	$\lambda_D = 0.037$ $W \cdot m^{-1} \cdot K^{-1}$	$\lambda_D = 0.034$ $W \cdot m^{-1} \cdot K^{-1}$	$\lambda_D = 0.032$ $W \cdot m^{-1} \cdot K^{-1}$
0.18	—	—	170 ⁽⁷⁾	160 ⁽⁷⁾	150	150
0.19	185 ⁽⁷⁾	175 ⁽⁷⁾	160 ⁽⁷⁾	150	150	150
0.25	140 ⁽⁷⁾	125	125	115 ⁽⁷⁾	100	—
0.26	130 ⁽⁷⁾	125	125	100	—	85
0.27	125	125	125	—	85	85
0.30	115 ⁽⁷⁾	125	100	85	75	75
0.35	—	85	85	65	75	75

- (1) Assumes 102 mm thick brick outer leaf and mild steel double-triangle ties (12.5 mm²) at 2.5 m⁻².
 (2) Based upon incremental insulation thickness range in Tables 1 and 3.
 (3) Dense plaster 0.57 W·m⁻¹·K⁻¹.
 (4) 20% dabs at 0.43 W·m⁻¹·K⁻¹.
 (5) Dense block at 1.13 W·m⁻¹·K⁻¹.
 (6) AAC block at 0.12 W·m⁻¹·K⁻¹ and 6.7% mortar (0.88 W·m⁻¹·K⁻¹) bridging inner block leaf.
 (7) Thickness achieved with two layers of insulation.

Table 5 Example cavity wall U values⁽¹⁾ — partial fill construction

U value requirement ($W \cdot m^{-2} \cdot K^{-1}$) ⁽¹⁾	Insulation thickness (mm) ⁽²⁾					
	13 mm dense plaster ⁽³⁾ 100 mm dense block ⁽⁵⁾			Plasterboard on dabs ⁽⁴⁾ 100 mm AAC block ⁽⁶⁾		
	$\lambda_D = 0.037$ $W \cdot m^{-1} \cdot K^{-1}$	$\lambda_D = 0.034$ $W \cdot m^{-1} \cdot K^{-1}$	$\lambda_D = 0.032$ $W \cdot m^{-1} \cdot K^{-1}$	$\lambda_D = 0.037$ $W \cdot m^{-1} \cdot K^{-1}$	$\lambda_D = 0.034$ $W \cdot m^{-1} \cdot K^{-1}$	$\lambda_D = 0.032$ $W \cdot m^{-1} \cdot K^{-1}$
0.18	190 ⁽⁷⁾	175 ⁽⁷⁾	170 ⁽⁷⁾	—	150	150
0.19	—	175 ⁽⁷⁾	160 ⁽⁷⁾	150	150	150
0.25	130 ⁽⁷⁾	125	125	100	—	85
0.26	125 ⁽⁷⁾	125	125	—	85	85
0.27	—	125	125	—	85	85
0.30	115 ⁽⁷⁾	100	—	75	75	75
0.35	—	85	85	65	75	75

- (1) Assumes 102 mm thick brick outer leaf and mild steel double-triangle ties (12.5 mm²) at 2.5 m⁻².
 (2) Based upon incremental insulation thickness range in Table 1 and Table 3.
 (3) Dense plaster 0.57 W·m⁻¹·K⁻¹.
 (4) 20% dabs at 0.43 W·m⁻¹·K⁻¹.
 (5) Dense block at 1.13 W·m⁻¹·K⁻¹.
 (6) AAC block at 0.12 W·m⁻¹·K⁻¹ and 6.7% mortar (0.88 W·m⁻¹·K⁻¹) bridging inner block leaf.
 (7) Thickness achieved with two layers of insulation.

6.3 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.

7 Water resistance



7.1 The product can be used in situations where it bridges the 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.

7.2 Constructions incorporating the product, and built in accordance with the Standards listed in section 4.2, will resist the transfer of precipitation to the inner leaf and satisfy the national Building Regulations.

8 Condensation

Interstitial condensation



8.1 Walls will adequately limit the risk of interstitial condensation when they are designed and constructed in accordance with BS 5250 : 2011, Annexes D and G, and the relevant guidance.

8.2 For the purposes of assessing the risk of interstitial condensation, the resin-bonded glass mineral wool vapour resistivity may be taken as approximately $5 \text{ MN}\cdot\text{s}\cdot\text{g}^{-1}\cdot\text{m}^{-1}$.

Surface condensation



8.3 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 junctions with other elements are designed in accordance with the guidance referred to in section 6.3 of this Certificate.



8.4 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 : 2011, Annex G. Further guidance may be obtained from BRE Report BR 262 : 2002 and section 6.3 of this Certificate.

9 Behaviour in relation to fire



The product is classified as Class A1* in accordance with BS EN 13501-1 : 2007 and is therefore non-combustible.

10 Maintenance

As the product is confined within the wall cavity and has suitable durability, maintenance is not required (see section 11).

11 Durability



The product is unaffected by the normal conditions in a wall construction, and is durable, rot proof, water resistant and sufficiently stable to remain effective as insulation for the life of the building.

Installation

12 General

12.1 The walls are constructed leading with either the inner or outer leaf, with Earthwool DriTherm Cavity Slab fixed to the cavity face of the leading leaf. In partial-fill use, it is recommended that the inner leaf is constructed ahead of the outer leaf and the slab fastened to the cavity face of the inner leaf. In full-fill use, it is recommended that the external leaf is constructed ahead of the internal leaf so that any mortar protruding into the cavity space from the back of the external leaf can be cleaned off before installing the slab.

Supervision requirements for buildings over 12 m in height and up to 25 m in height — Full-fill

12.2 To comply with this Certificate, the Certificate holder's installation and site practice specialists will attend the site to provide demonstrations to ensure correct installation from the outset.

12.3 Adequate supervision of the installation must be maintained and the Certificate holder's specialists must have right of access to the site.

13 Procedure

Partial-fill

13.1 The procedure for installing the product using conventional insulation wall ties is as follows:

- a section of the leading leaf is built with the first row of wall ties, at approximately 600 mm horizontal spacing, where the insulation is to begin. The first run of slabs may commence below the dpc level to provide some edge insulation for the floor (see Figure 1)
- the leading leaf is then built up to a minimum height of 675 mm, with a second row of wall ties at 450 mm vertical spacings. It is essential that all wall ties slope downwards towards the outer leaf. The slabs are then compressed slightly between the upper and lower wall ties, behind the retaining clips or wheels to form a closely butt-jointed run (see Figure 1).

13.2 The horizontal spacings of the wall ties is determined as follows:

- where insulation-retaining ties/clips are sufficient for structural purposes, horizontal spacings should be 450 mm or 600 mm (depending on the thickness of the thinner leaf)
- where additional vertical twist ties are required, insulation-retaining ties/clips should be spaced at 600 mm horizontal centres to give adequate retention of the slabs: the additional ties are spaced in accordance with BS EN 845-1 : 2013. PD 6697 : 2010 should 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 (see Figure 1).

13.3 The other leaf is then built up to the level of the top of the slabs.

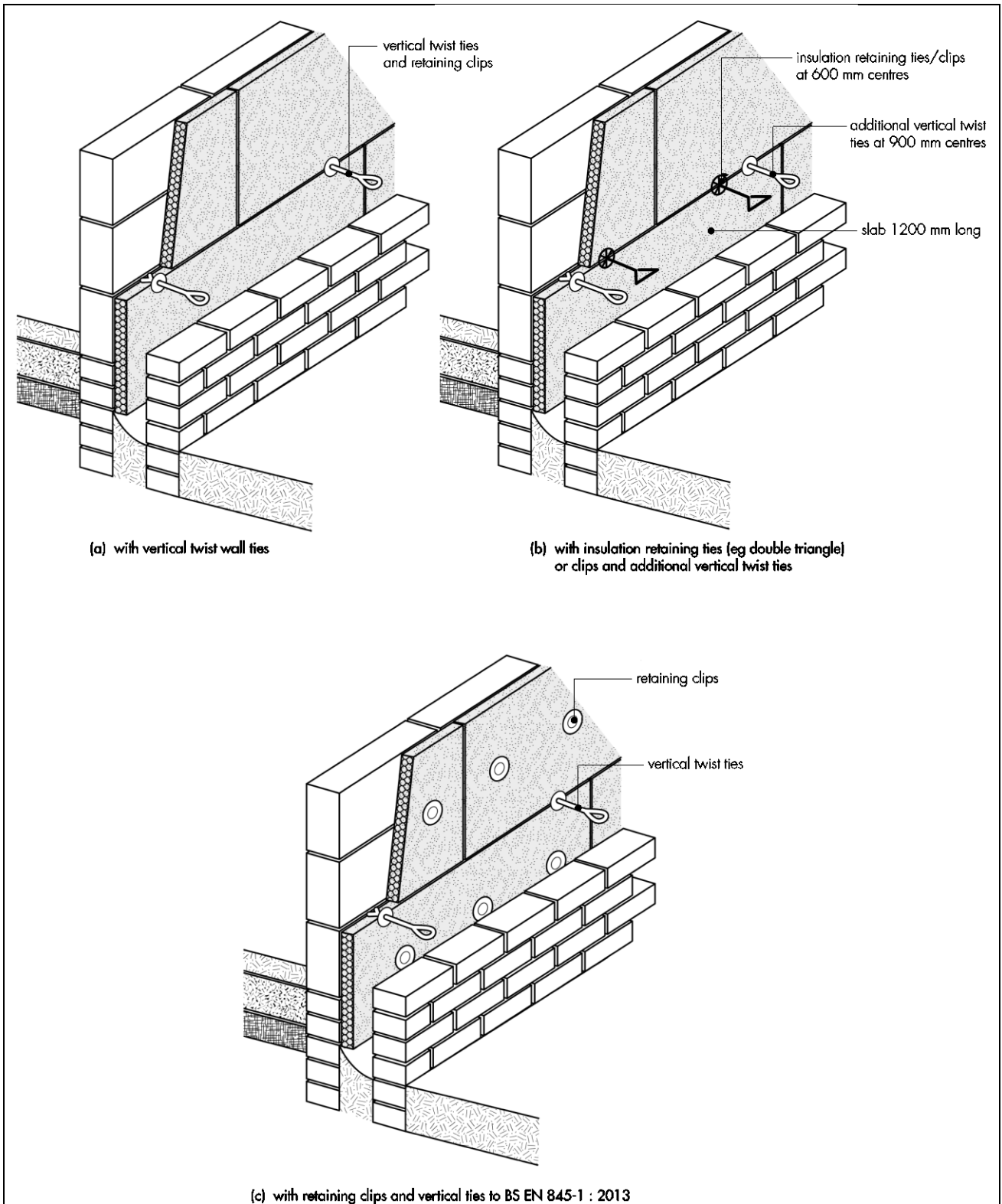
13.4 Successive sections of wall (incorporating approved wall ties) are constructed and the product installed.

13.5 The procedure for installing the product using the penetration clip-retaining system is as follows:

- a section of the leading leaf is built with the first row of wall ties, at approximately 600 mm horizontal spacing, where the insulation is to begin. The first run of slabs may commence below the dpc level to provide some edge insulation for the floor (see Figure 1)
- the leading leaf is built up to a minimum a height of 675 mm, with a second row of wall ties at 450 mm vertical spacing. The ties are positioned at 450 or 900 mm horizontal spacings (depending on the thickness of the thinner leaf). The slabs are compressed slightly between the upper and lower wall ties to form a closely butt-jointed run. The slabs are then retained against the leading leaf by the insulation-retaining clips (see Figure 1), which are pressed lightly through the insulation and located in the 'green mortar' bed joint, except at dpc level where the clips may be located in the perpend joints. It is important that the mortar should have the correct consistency; it should be stiff enough to retain the clip yet soft enough to avoid any hammering into place. Three clips per slab are required at approximately 400 mm centres.

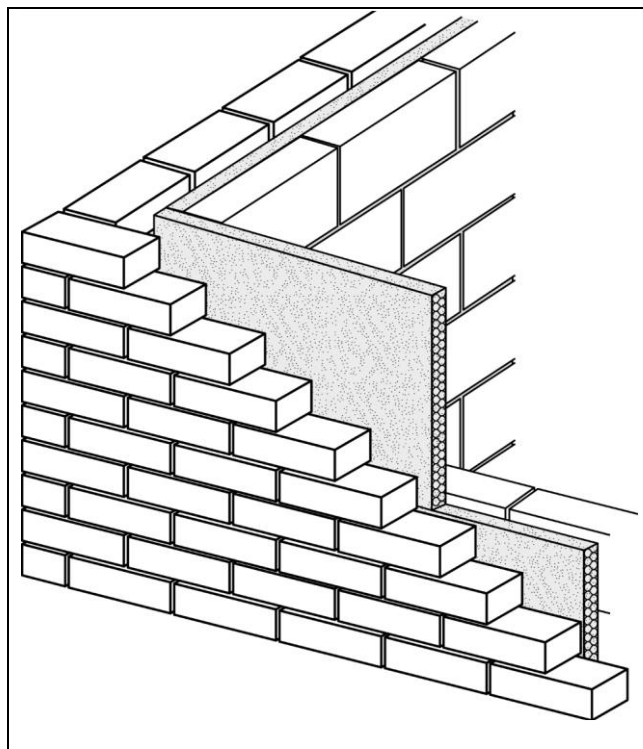
13.6 Where additional ties are required at less than 450 mm vertical spacing, the slabs must be cut and neatly fitted around them. Under no circumstances should they be impaled over ties.

Figure 1 Partial-fill fixing systems



13.7 The slabs should be close-butted at corners (see Figure 2). It is recommended that whole slabs should be used at corners, but if this is not possible the edge butting faces should be factory cut.

Figure 2 Slabs butted at corners



Full-fill

13.8 Walls are constructed in the conventional manner, with the first row of wall ties where the insulation is to begin, but not on the dpc, and at approximately 600 mm horizontal spacing. The first run of slabs may commence below the dpc level to provide some edge insulation for the floor (see Figure 4).

13.9 A section of the wall leaf is built up to a course above the next row of wall ties which are placed at the usual spacing of 450 mm vertically and not more than 900 mm horizontally.

13.10 The slabs are compressed slightly and placed between the upper and lower wall ties to form a closely butt-jointed run (see Figure 4).

13.11 The drip on each of the upper wall ties is inserted into the top of the slabs. This is important to ensure that it functions correctly (see Figure 5).

13.12 The other leaf is built up to the same level as the slabs, with its inner face in contact with the slabs (see Figure 5).

13.13 Successive sections of wall, incorporating wall ties, are constructed and the slabs installed as work proceeds up to the required height.

13.14 After each section of the wall leaf is built, excess mortar should be removed and mortar droppings cleaned from exposed edges of the installed slab (see Figure 3a) before installation of the next section of slabs.

13.15 It is recommended that 50 to 75 mm thick slabs are bent around corners (see Figure 6). Thicker slabs should be close butted to avoid cold bridges.

13.16 Where openings such as doors and windows are in close proximity, it is recommended that a continuous lintel is used. Individual lintels should have stopends.

13.17 The slabs can be cut with a sharp knife to fit features such as windows, doors, apertures and air bricks.

13.18 It is essential that cut pieces completely fill the spaces for which they are intended and no gaps are left in the insulation (see Figure 7).

13.19 Small pieces must be fitted with the fibre layer parallel to the plane of the wall.

13.20 The slabs should always be installed to the highest level of each wall.

13.21 If installation of slabs is terminated at any other levels, the top edge of the insulation must be protected by a cavity tray and alternate perpend joints raked out (to provide adequate drainage of water from the cavity tray).

13.22 The two-layer insulation is identical to the single-layer insulation, but the vertical joints in the second layer must not be coincident with the vertical joints in the first layer.

Mortar droppings

13.23 After each section of the leading leaf is built, excess mortar should be removed from the cavity face and mortar droppings cleaned from exposed edges of the installed slabs before installation of the next run of the product. Use of a cavity board or cavity batten is recommended to protect slab edges and make cleaning easier (see Figure 3).

Cut pieces

13.24 The slabs can be cut using a sharp knife, to fit around features such as windows, doors and air bricks. It is essential that cut pieces completely fill the spaces for which they are intended and that no gaps are left in the insulation.

Protection

13.25 Exposed areas of slabs should always be covered at the end of a day's work or in driving rain.

13.26 All building involving the products, particularly interrupted work, must conform to BS EN 1996-2 : 2006, Sections 3.2 *Acceptance, handling and storage of materials* and 3.6 *Curing and protective procedures during execution*.

Figure 3 Removal of excess mortar

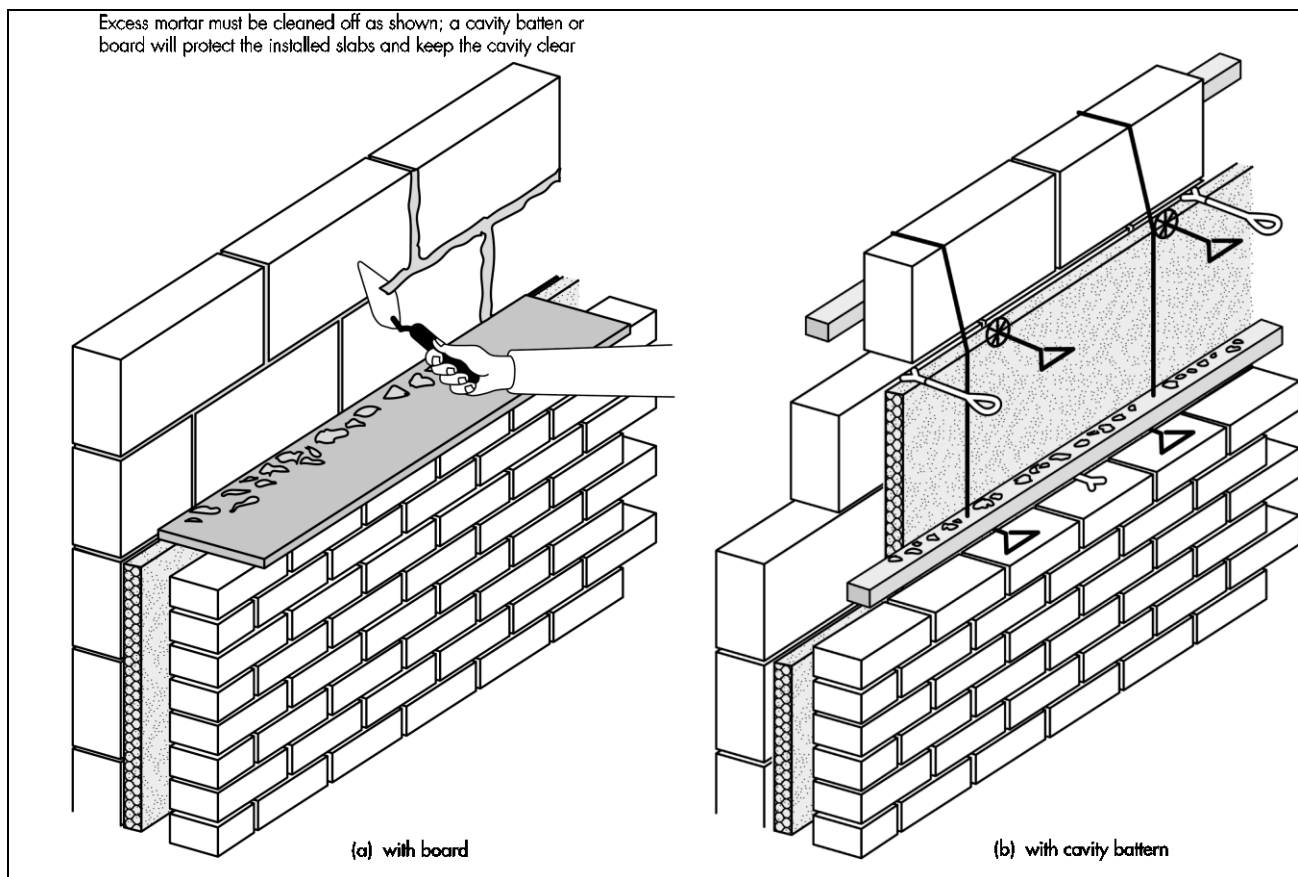


Figure 4 Building in the first row of slabs

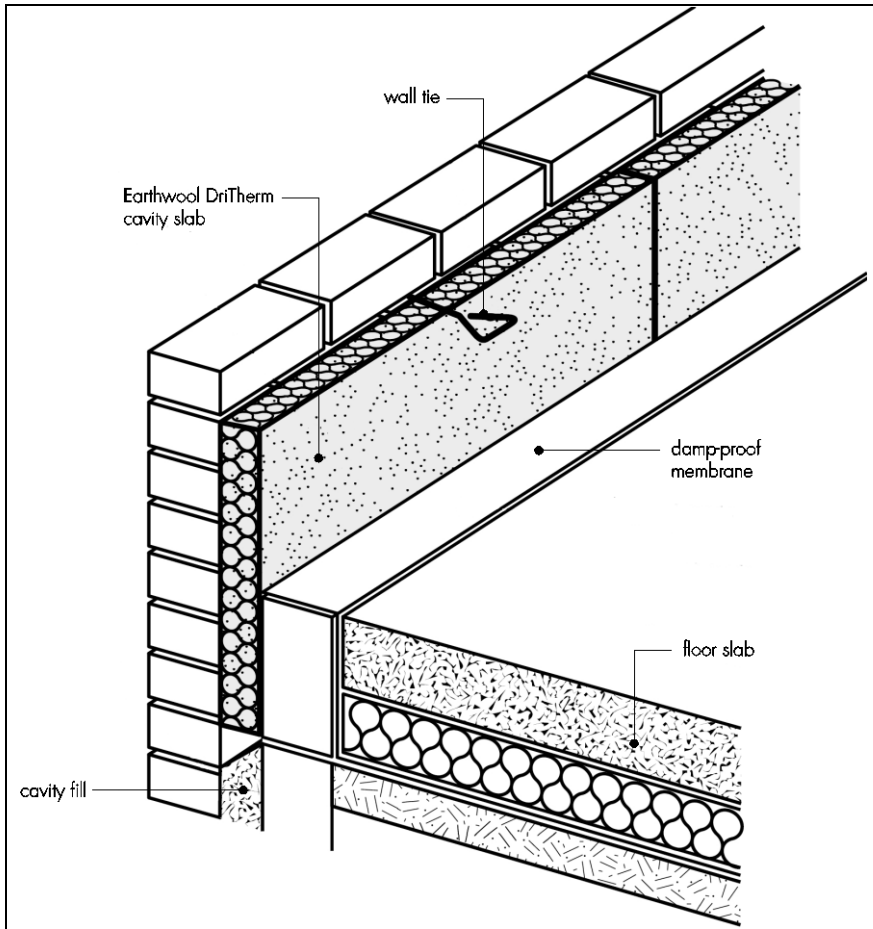


Figure 5 Wall tie drips positioned in centre of slabs

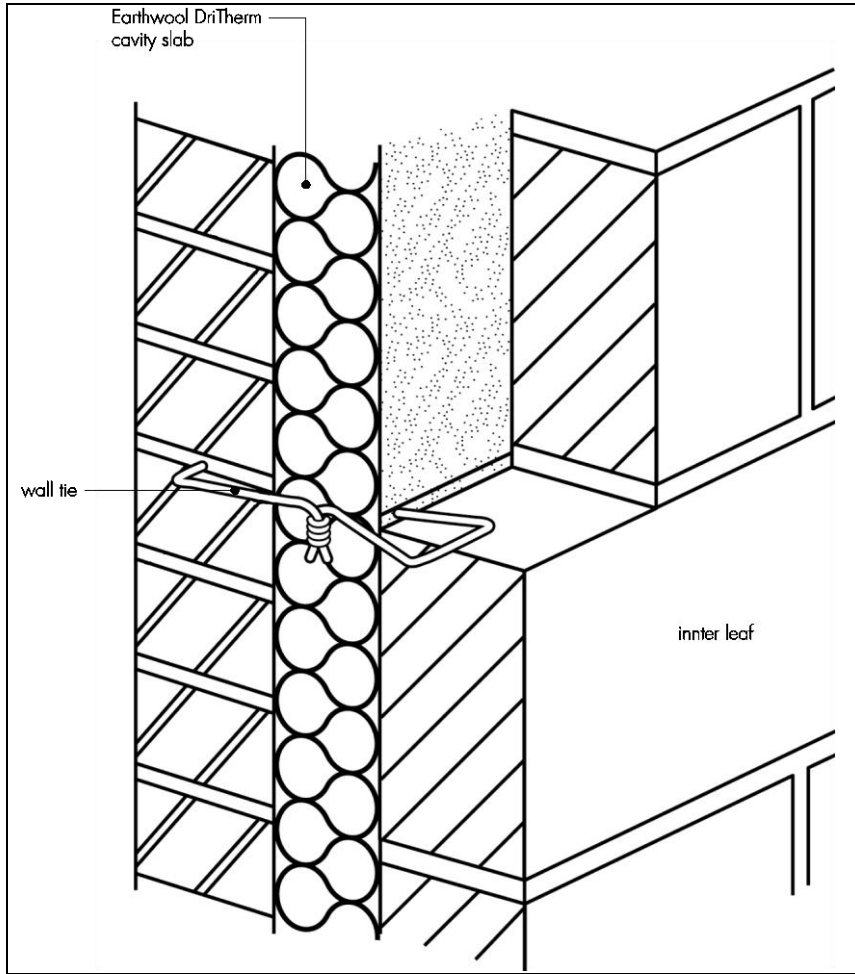
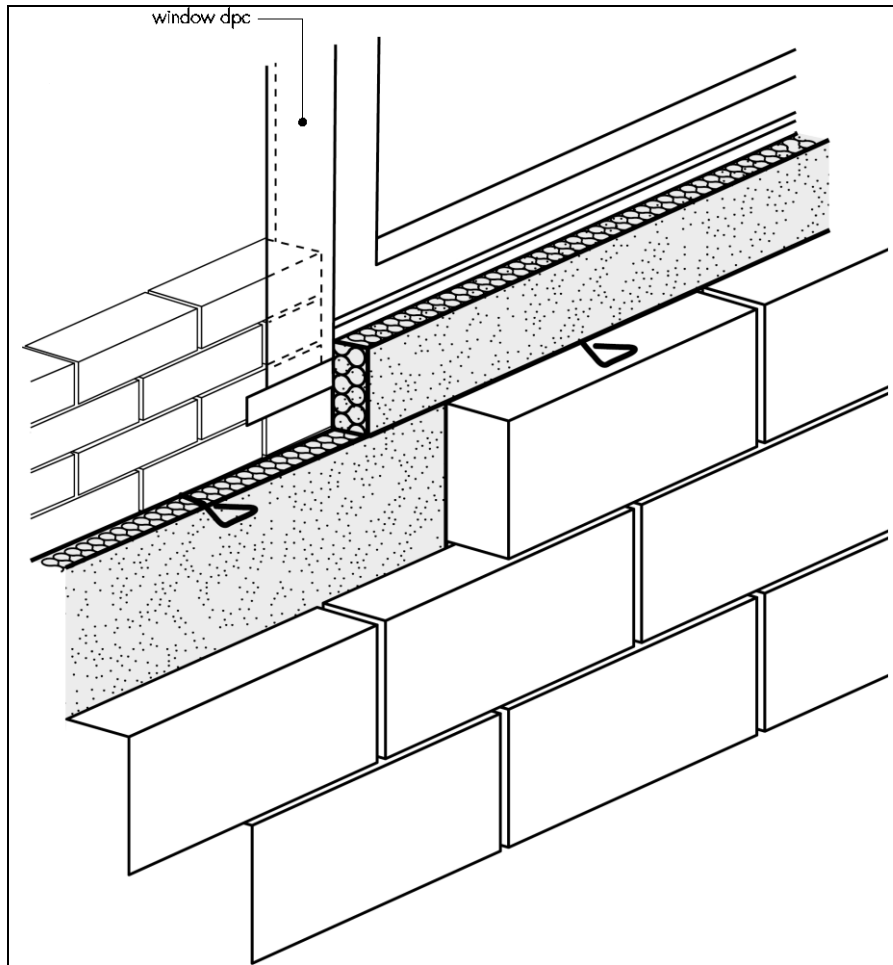


Figure 6 Use of cut pieces in/around gaps



Technical Investigations

14 Tests

Tests were carried out and the results assessed to determine:

- density
- resistance to water penetration
- water uptake at saturation
- water absorption at high relative humidity
- dimensional accuracy
- efficiency of fixing the system
- effect on the water resistance of the cavity wall with the slabs installed (full-fill).

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 the materials used.

15.2 An examination was made of quality control data relating to Earthwool DriTherm Cavity Slab.

15.3 The company's design and installation instructions were examined.

15.4 An assessment of the risk of interstitial and surface condensation was made.

15.5 U values were calculated for typical wall constructions.

Bibliography

- BS 5250 : 2011 + A1 : 2016 *Code of practice for control of condensation in buildings*
- 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 : 2001 *Workmanship on building sites — Code of practice for masonry*
- BS EN 845-1 : 2013 + A1 : 2016 *Specification for ancillary components for masonry — Wall ties, tension straps, hangers and brackets*
- 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*
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- BS EN 1996-2 : 2006 *Eurocode 6 : Design of masonry structures — Design considerations, selection of materials and execution of masonry*
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- BS EN 1996-3 : 2006 *Eurocode 6 : Design of masonry structures : Simplified calculation methods for unreinforced masonry structures*
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- BS EN 13162 : 2012 + A1 : 2015 *Thermal insulation products for buildings - Factory made mineral wool (MW) 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*
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- BS EN ISO 9001 : 2008 *Quality management products — Requirements*
- BRE Report BR 262 : 2010 *Thermal insulation : avoiding risks*
- BRE Report BR 443 : 2006 *Conventions for U-value calculations*
- PD 6697 : 2010 *Recommendations for the design of masonry structures to BS EN 1996-1-1 and BS EN 1996-2*

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 claim that this Certificate has been issued to them
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- is subject to English Law.

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- 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.

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- 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.

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