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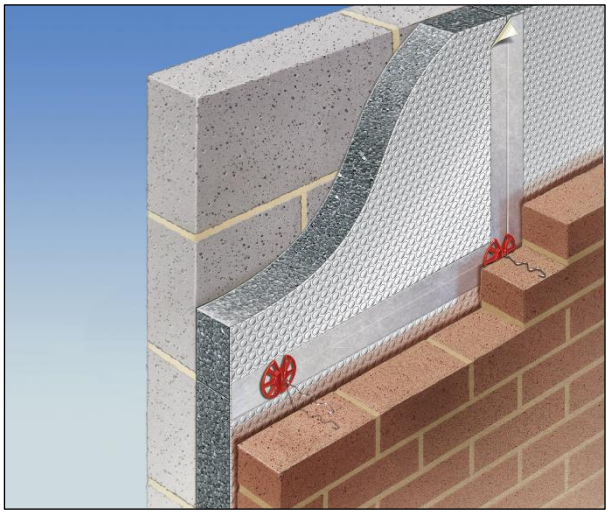
Agrément Certificate
93/2861
Product Sheet 8

ALREFLEX RANGE OF CAVITY WALL INSULATION AND CAVITY RAIN BARRIERS

ALREFLEX FULLFILL CAVITY INSULATION BOARD

Agrément Certificate Product Sheet(1) relates to Alreflex Fullfill Cavity Insulation Board, a single-layer polyethylene bubble sheet faced on one side with aluminium foil and attached to a rigid expanded polystyrene insulation board, for use as full fill thermal insulation (with a 10 mm residual cavity) and a rain barrier in masonry cavity walls in new domestic and non-domestic buildings up to 25 metres in height; additional requirements apply for buildings above 12 metres in height. The product is installed during construction.

(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 has a declared thermal conductivity (λ_D) of 0.030 $W \cdot m^{-1} \cdot K^{-1}$ for the insulation board, a thermal resistance of 0.10 $m^2 \cdot K \cdot W^{-1}$ for the bubble sheet and an emissivity of 0.03 for the foil (see section 6).

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

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

Behaviour in relation to fire — the product has a Class 1 surface spread of flame classification when tested to BS 476-7 : 1997 (see section 9).

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 First issue: 22 August 2017

John Albon – Head of Approvals Construction Products

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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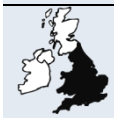
Regulations

In the opinion of the BBA, Alreflex Fullfill Cavity Insulation Board, 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 can contribute to satisfying this Requirement. See sections 9.1 and 9.5 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 12 and the *Installation* part of this Certificate.
Regulation:	**26**	**CO_2 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 although compensating fabric and/or services measures may need to be taken. See section 6.2 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 12 and the *Installation* part of this Certificate.
Regulation:	**9**	**Building standards applicable to construction**
Standard:	2.6	Spread to neighbouring buildings
Comment:		The product is not non-combustible but may be used in walls of buildings in accordance with the exceptions permitted in this Standard, with reference to clauses 2.6.5(1) and 2.6.6(2). See sections 9.1 and 9.5 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 8.2 and 8.3 of this Certificate.
Standard:	6.1(b)	Carbon dioxide emissions
Standard:	6.2	Building insulation envelope
Comment:		The product can contribute to satisfying this Standard with reference to 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)], 6.2.5[(2)], 6.2.9[(1)], 6.2.10[(1)], 6.2.11[(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 6.1 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 *Installation* 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 8.3 of this Certificate.
Regulation:	**35(4)**	**Internal fire spread — Structure**
Comment:		The product can contribute to satisfying this Regulation. See sections 9.1 and 9.5 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.

Additional Information

NHBC Standards 2017

In the opinion of the BBA, Alreflex Fullfill Cavity Insulation Board (other than in very severe exposure locations with fair-faced masonry), if installed, used and maintained in accordance with this Certificate, can satisfy or contribute to satisfying the relevant requirements in relation to *NHBC Standards*, Chapter 6.1 *External masonry walls*.

CE marking

The Certificate holder has taken the responsibility of CE marking the product in accordance with harmonised European Standard BS EN 13163 : 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 Alreflex Fullfill Cavity Insulation Board consists of a polyethylene bubble sheet faced on one side with aluminium foil attached to a rigid expanded polystyrene insulation board. Once installed, the joints between two boards are sealed by TE Alreflex breathable tape.

1.2 The nominal characteristics are given in Table 1.

Table 1 Nominal characteristics

Length (mm)	1200
Width (mm	450
Thickness of the bubble film (mm)	3
Thickness of the rigid board (mm)	Starting from 25 mm, increasing in 5 mm increments
Edge detail	Square edged

1.3 Ancillary items outside the scope of this Certificate:

- TE Alreflex breathable tape
- TE aluminium tape.

2 Manufacture

2.1 Aluminium foil is laminated to the outside of the polyethylene bubble sheet and, at a preset point, a third layer of low density material is laminated and a flat surface is given to both sides. The product is then sent to another location where it is bonded to the expanded polystyrene insulation.

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 : 2008 and/or BS EN ISO 14001 : 2004 by BSI (Certificate MF82602).

3 Delivery and site handling

3.1 The product is delivered to site wrapped in polythene, with the production code printed on each board. Each pallet carries a label bearing the production date, and board size and thickness.

3.2 The product should be stored off the ground and under cover to protect it from precipitation, and in clean and dry conditions. Damaged or wet products should be discarded.

Assessment and Technical Investigations

The following is a summary of the assessment and technical investigations carried out on Alreflex Fullfill Cavity Insulation Board.

Design Considerations

4 General

4.1 Alreflex Fullfill Cavity Insulation Board is satisfactory for use as full fill cavity wall insulation (with a 10 mm residual cavity) in new cavity walls with masonry inner and outer leaves (where masonry includes clay and calcium silicate bricks, concrete blocks and natural and reconstituted stone blocks) and is effective in reducing the thermal transmittance (U value), and providing a rain barrier. It is essential that such walls are designed and constructed to incorporate the normal precautions to prevent moisture penetration.

4.2 This Certificate covers the use of the product in any exposure zone. However, 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 application would be normal practice.

4.3 As with other forms of cavity wall insulation, where buildings need to comply with the latest NHBC Standards, specifiers should observe the requirements of that document.

4.4 New buildings subject to the national Building Regulations should be designed and constructed in accordance with the relevant recommendations of:

- 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 and BS 8000-3 : 2001.

4.5 New buildings not subject to these Regulations should also be built in accordance with the Standards listed in section 4.3 of this Certificate.

4.6 Cavity wall ties with insulation-retaining fixings and, if required, any additional ties to BS EN 845-1 : 2013 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. The Certificate holder can advise on suitable insulation-retaining fixings and compatible wall ties for use with the product. These items are outside the scope of this Certificate.

4.7 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 (dpc's)
- 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.

4.8 The use of cavity battens or boards is strongly recommended to prevent thermal bridging by mortar droppings.

4.9 It is recommended that installation is carried out to the highest level on each wall, or that the top edge of the insulation is protected by a cavity tray.

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

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

- from ground level, the maximum height of continuous cavity must not exceed 12 metres. Above 12 metres, the maximum height of continuous cavity must not exceed 7 metres
- the area to be insulated must not be an infill panel in a framed structure
- the Certificate holder in association with the architect must 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.

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 the thermal transmittance (U value) of specific external wall constructions should be carried out in accordance with BS EN ISO 6946 : 2007 and BRE Report BR 443 : 2006, using the declared thermal conductivity (λ_D) value* of 0.030 $W \cdot m^{-1} \cdot K^{-1}$ for the expanded polystyrene insulation and the following data for the product:

0.03	outer surface emissivity of the product
0.10(1) $m^2 \cdot K \cdot W^{-1}$	core *R* value of the bubble wrap
0.38(1)(2) $m^2 \cdot K \cdot W^{-1}$	*R* value of an air cavity adjacent to the product ≥20 mm thick (horizontal heat flow).

(1) Unventilated cavity with a width and length at least 10 times the thickness and one high-emissivity surface.
(2) For guidance on U value calculations, refer to BBA Information Bulletin No 3.

6.2 The U value of a completed wall will depend on the selected insulation thickness, number and type of fixings, the insulating value of the substrate masonry and its internal finish. Calculated U values for example constructions are given in Table 2.

Table 2 Typical cavity wall U(1) values ($W \cdot m^{-2} \cdot K^{-1}$)

U values ($W \cdot m^{-2} \cdot K^{-1}$)	EPS board thickness (mm)	
	Aerated concrete block	Dense concrete block
	λ = 0.12 ($W \cdot m^{-1} \cdot K^{-1}$) density = 400 $kg \cdot m^{-3}$	λ = 1.13 ($W \cdot m^{-1} \cdot K^{-1}$) density = 1800 $kg \cdot m^{-3}$
0.35	40	65
0.30	50	80
0.28	60	85
0.27	65	90
0.25	70	100
0.19	105	135
0.18	120	145

(1) The above U value calculations are based on the following:
— 5 mm increments of product thickness, rounded upwards
— cavity wall ties — mild steel, 2.5 per m^2, 12.5 mm^2 cross-section
— 102 mm brick with conductivity 0.77 $W \cdot m^{-1} \cdot K^{-1}$
— 10 mm low emissivity cavity
— 100 mm dense block with conductivity 1.13 $W \cdot m^{-1} \cdot K^{-1}$ or
— 100 mm AAC block with conductivity 0.12 $W \cdot m^{-1} \cdot K^{-1}$ bridged by mortar (6.7%) with conductivity 0.88 $\cdot m^{-1} \cdot K^{-1}$
— 13 mm dense plaster with conductivity 0.57 $W \cdot m^{-1} \cdot K^{-1}$ or
— 12.5 mm plasterboard with conductivity 0.21 $W \cdot m^{-1} \cdot K^{-1}$, on 15 mm dabs (20%) with conductivity 0.43 $W \cdot m^{-1} \cdot K^{-1}$.

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 Where the product is 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.

7.2 Constructions incorporating the product and built in accordance with the Standards listed in section 4.3, will resist the transfer of precipitation to the inner leaf and satisfy the national Building Regulations.

7.3 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 external face of the instruction
- 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 boards 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, stop ends and weep holes must be provided
- cavity battens and/or boards are used during construction to prevent bridging by mortar droppings.
- dpc's at ground level do not project into the cavity as they can form a trap for mortar bridging
- raked or recessed mortar joints should be avoided in very severe exposure areas.

7.4 Window and door opening reveals should be constructed incorporating a cavity barrier/closer/dpc as required.

7.5 Wall corners are to be constructed incorporating a vertical dpc.

8 Condensation

Surface condensation

8.1 Walls incorporating the product will adequately limit the risk of surface condensation when the thermal transmittance (U value) does not exceed 0.7 $W \cdot m^{-2} \cdot K^{-1}$ at any point, and the junctions with other elements are designed in accordance with the guidance referred to in section 6.3 of this Certificate.

8.2 For buildings in Scotland, wall constructions will be acceptable when the thermal transmittance (U value) does not exceed 1.2 $W \cdot m^{-2} \cdot K^{-1}$ 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.

Interstitial condensation

8.3 Walls incorporating the product 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.

8.4 The rigid board has a nominal vapour resistivity of 60 $MN \cdot s \cdot g^{-1} \cdot m^{-1}$, the bubble film has a vapour resistance exceeding 125 $MN \cdot s \cdot g^{-1}$ and the foil on the PUR board has a water vapour resistance value of 111 $MN \cdot s \cdot g^{-1}$. Joints between boards will facilitate the passage of water vapour under normal conditions of temperature and humidity.

8.5 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 in the internal wall leaf.

8.6 Where calculations to Annex D of BS 5250 : 2011 indicate a risk of persistent condensation, a site specific dynamic analysis to BS EN 15026 : 2007 should be considered.

9 Behaviour in relation to fire

9.1 The insulation core of the product has a reaction to fire classification* of Class F to BS EN 13501-1 : 2007. The product has a surface spread of flame classification of Class 1 when tested to BS 476-7 : 1997.

9.2 The requirements of the national Building Regulations relating to fire spread in cavity walls can be met in buildings of all-purpose groups without the need for cavity barriers, provided the construction complies with the provisions detailed in:

England and Wales — Approved Document B, Volume 1, Diagram 13, and Volume 2, Diagram 34
Northern Ireland — Technical Booklet E, Diagram 4.5.

9.3 For buildings subject to the Building Standards in Scotland, cavity barriers are not required to limit the area of a cavity or at junctions with other wall cavities. Cavity barriers are required around openings, penetrations and junctions with roof or floor cavities, with reference to clauses 2.4.1[(1)(2)], 2.4.2[(1)(2)], 2.6.5[(1)] and 2.6.6[(2)].

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

9.4 For constructions not covered by sections 9.2 and 9.3, cavity barriers must be provided to comply with:

England and Wales — Approved Document B, Volume 1, Section 6, and Volume 2, Section 9
Scotland — Mandatory Standard 2.4, clauses 2.4.1[(1)(2)], 2.4.2[(1)(2)], 2.4.7[(1)] and 2.4.9[(2)]

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

Northern Ireland — Technical Booklet E, Paragraphs 4.36 to 4.39.

9.5 The product is not classified as 'non-combustible' or of 'limited combustibility', but may be used without height restriction in a wall on, or less than 1 metre from, a relevant boundary provided it is installed in a cavity that is between two leaves of masonry at least 75 mm thick, and which has a cavity barrier around all openings in the wall and at the top of the wall head. The use of the product in constructions not meeting this specification is limited to 18 metres in height.

9.6 Cavity walls should always have a cavity closer at the top of the cavity and around openings. The materials must not be taken past fire stops. If fire does penetrate into an unventilated cavity, the amount of air present will be insufficient to support combustion and flame spread will be minimal.

10 Proximity of flues and appliances

When installing the product in close proximity to certain flue pipes and/or heat-producing appliances, the relevant provisions of the national Building Regulations are applicable:

England and Wales — Approved Document J, sections 1 to 4
Scotland — Mandatory Standard 3.19, clauses 3.19.1[(1)(2)] to 3.19.9[(1)(2)]

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

Northern Ireland — Technical Booklet L, section 2.

11 Maintenance

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

12 Durability

The product is unaffected by the normal conditions found 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

13 General

13.1 The walls are constructed leading with either the inner or outer leaf. It is recommended that the inner leaf be constructed ahead of the outer leaf as, fastened to the cavity face of the inner leaf, the product gives a slightly enhanced thermal performance. 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 two points.

13.2 All joints must be taped over with the TE Alreflex breathable tape.

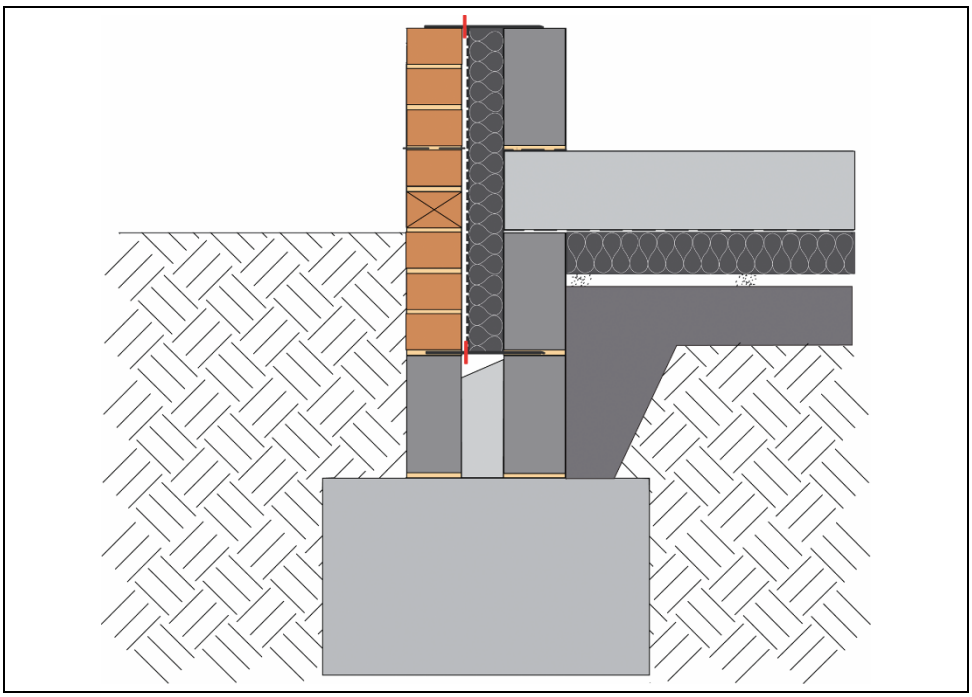
13.3 The corners of the boards must be taped with the TE aluminium tape.

14 Procedure

14.1 A section of the inner leaf is built with the first row of wall ties, at approximately 600 mm horizontal spacings, where the insulation is to begin. It is recommended that the wall ties are not placed directly on the dpc. The first run of the product may commence below dpc level(1)(2) to provide some edge insulation for the floor (see Figure 1).

(1) at least 150 mm.
(2) or 200 mm for suspended timber floors.

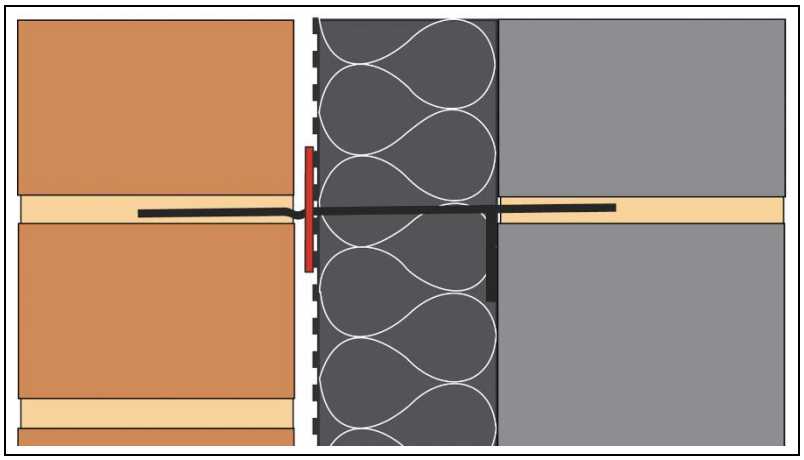
Figure 1 Typical installation detail including wall ties



14.2 The leading leaf is built up to the required height, with wall ties placed at a vertical height of 450 mm, ensuring the drip of the tie is located halfway across the residual cavity width. Excess mortar is cleaned from the cavity face of the leading leaf, and the product placed on the wall ties, behind the retaining clips, to form a closely butt-jointed run. The product must be fitted with the foil surface facing towards the outer leaf.

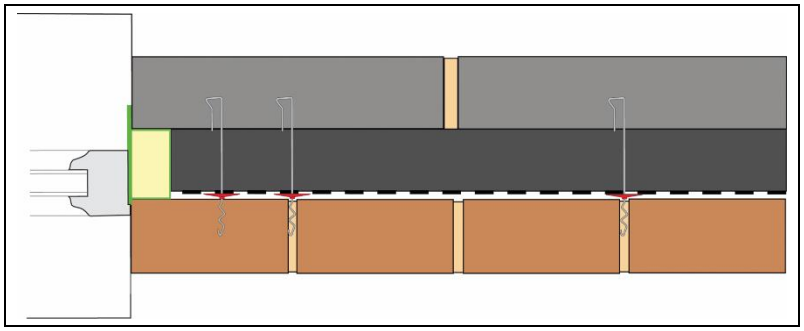
14.3 The second row of wall ties is fitted to retain the tops of the product. It is essential that all wall ties slope downwards towards the outer leaf (see Figure 2) and at centres not exceeding 900 mm to ensure that each board is secured at a minimum of three points.

Figure 2 Installation of wall ties



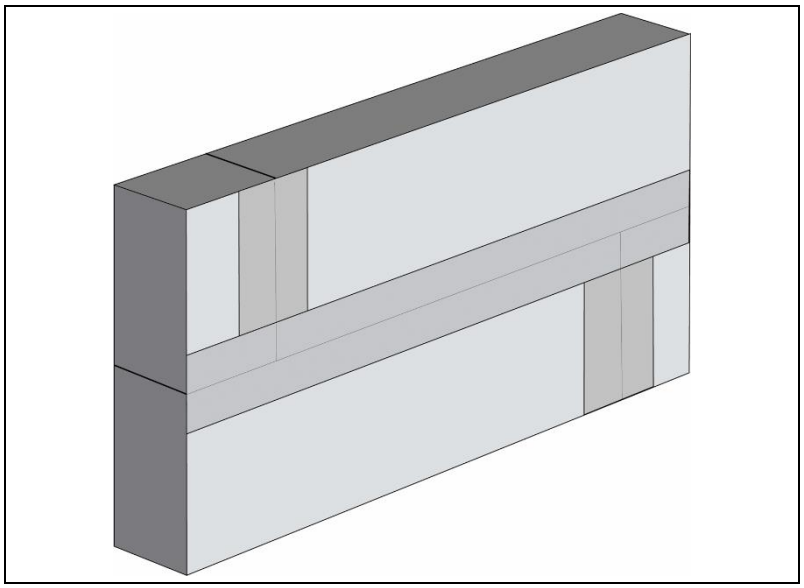
14.4 Additional wall ties at 300 mm vertical centres of all openings are recommended in BS EN 845-1 : 2013, BS EN 1996-1-1 : 2005, BS EN 1996-1-2 : 2005 and BS EN 1996-3 : 2006. For this product, this would involve piercing the boards and may introduce an unacceptable risk of water penetration. Therefore, it is recommended that an additional wall tie is included within 225 mm of the opening on each board course level to satisfy the structural requirements of the wall. See Figure 3.

Figure 3 Additional wall ties



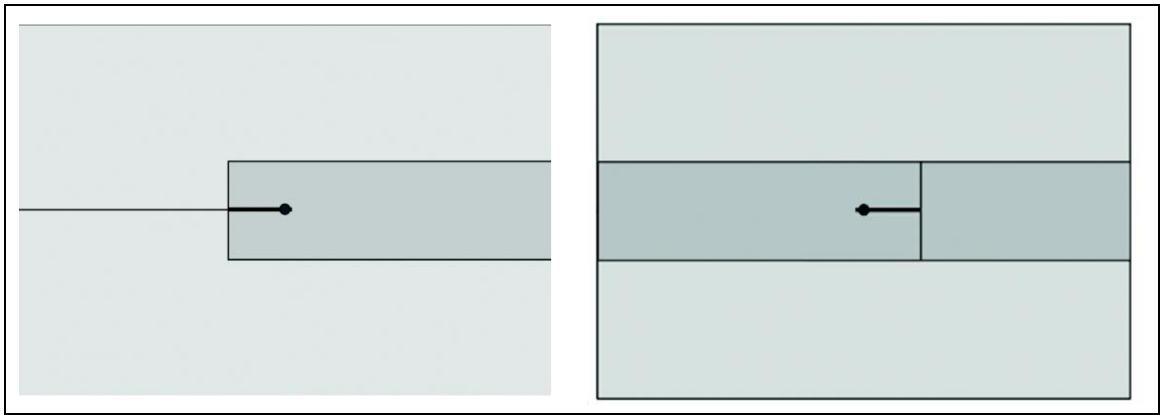
14.5 All joints should be sealed with self-adhesive Alreflex breathable tape, ensuring that the board joint is positioned centrally on the tape and that the tape is fully adhered across its entire surface and is not wrinkled or creased. Where necessary, additional layers may be used to ensure joints are sealed – see Figure 4.

Figure 4 Taped joint



14.6 To seal around wall ties, a 50 mm cut should be made down the centre of the tape so that it can be fitted around the tie as per Figure 5 (left image).The same process should be carried out on the next piece of tape as per Figure 5 (right image).

Figure 5 Tape round wall ties



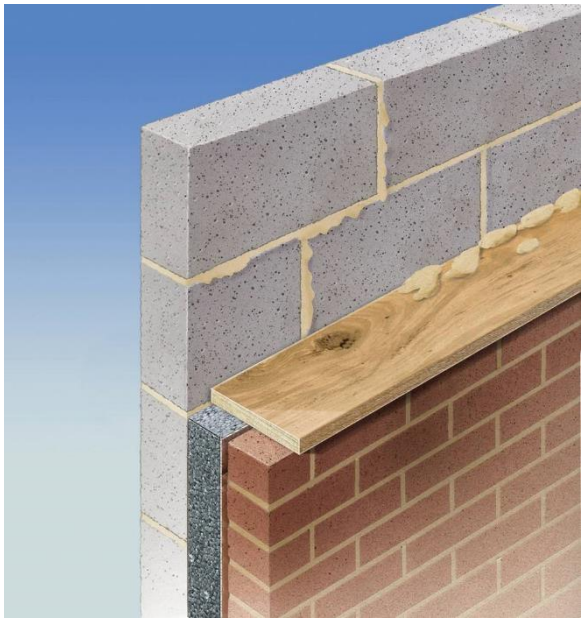
14.7 The external leaf is built up to the same level as the insulation boards; a 10 mm residual cavity should be maintained to aid insulation and accommodate mortar squeeze.

14.8 The product should be butted with vertical joints staggered. Insulation boards and wall ties should be staggered as construction proceeds and carried up to the highest level of wall, except where protected by a cavity tray.

Mortar droppings

14.9 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 product, before installation of the next run. Use of a cavity board or a cavity batten will protect the installed product and help keep the cavity clean as the following leaf is built (see Figure 6).

Figure 6 Use of a cavity board



Wall openings

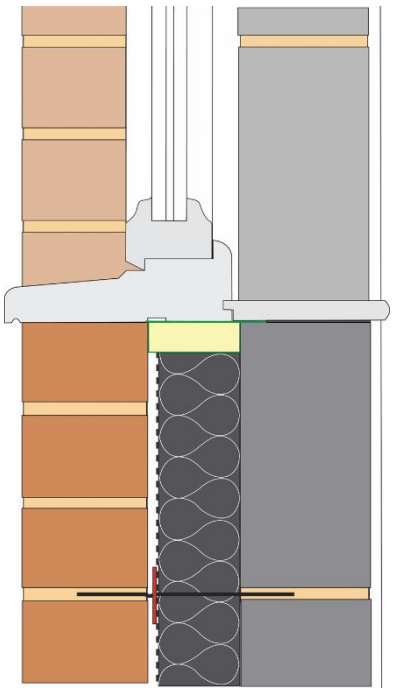
14.10 Where openings such as doors and windows are in close proximity, it is recommended that a continuous lintel or cavity tray is used. Individual lintels or cavity trays should have stop ends and be adequately drained.

Cut pieces

14.11 The product can be cut, using a sharp knife or fine-toothed saw, to fit around windows, doors or air bricks. It is essential that cut pieces completely fill the spaces for which they are intended and are adequately secured — gaps should not be left in the insulation.

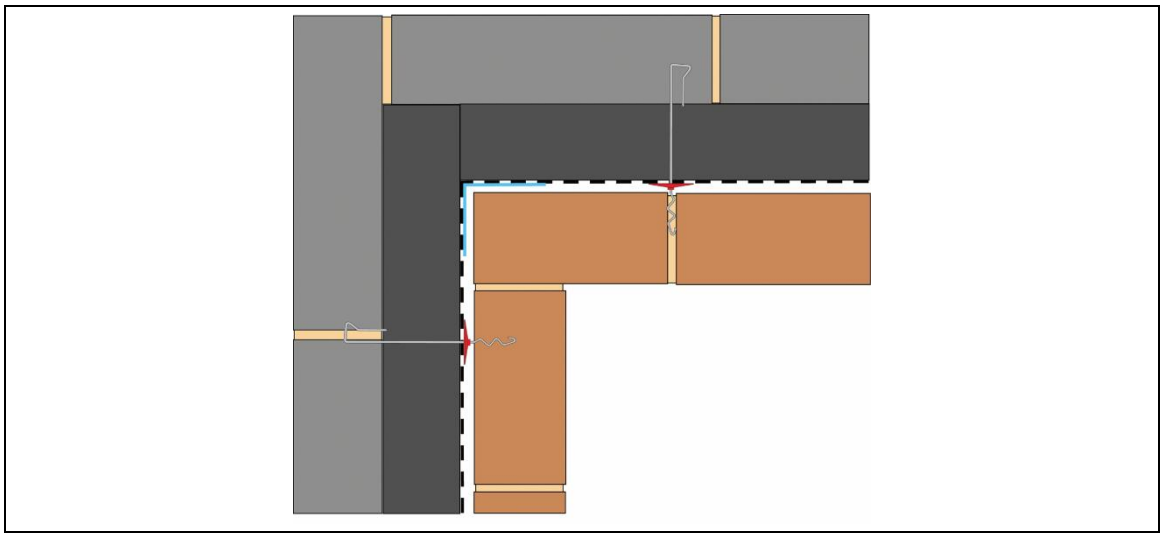
14.12 Proprietary cavity barriers/closers must be correctly installed at window and door reveals. See Figure 7.

Figure 7 Details around window and door reveals



14.13 Corner joints should be block bonded and taped with TE aluminium tape, ensuring that all edges are completely covered – see Figure 8.

Figure 8 Corner details



14.14 All building involving the produce, 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*.

Technical Investigations

15 Investigations

15.1 Tests and assessment were carried out on Alreflex Fullfill Cavity Insulation Board to determine:

For the whole product in its application:

- resistance to rain penetration test at a residual cavity of 10 mm.

For the board:

- water vapour resistance
- density
- compressive strength at 10% strain
- water absorption
- thermal conductivity (fresh and aged)
- dimension accuracy
- closed-cell count
- dimensional stability with temperature and humidity
- cross-breaking strength
- fire behaviour.

For the bubble sheet:

- emissivity.

For the whole product:

- laminated bond strength.

15.2 A condensation risk analysis was carried out.

15.3 A series of U value calculations were carried out.

Bibliography

BS 476-7 : 1997 *Fire Tests on Building Materials and Structures — Method of Test to Determine the Classification of the Surface Spread of Flame of Products*

BS 5250 : 2011 *Code of practice for control of condensation in buildings*

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

BS EN 845-1 : 2013 *Specification for ancillary components for masonry — Ties, tension straps, hangers and brackets*

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

BS EN 1996-1-2 : 2005 *Eurocode 6 : Design of masonry structures — General rules — Structural fire design*
NA to BS EN 1996-1-2 : 2005 UK National Annex to *Eurocode 6 : Design of masonry structures — General rules — Structural fire design*
BS EN 1996-2 : 2006 *Eurocode 6 : Design of masonry structures — Design considerations, selection of materials and execution of masonry*
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BS EN 13163 : 2012 *Thermal insulation products for buildings — Factory made expanded polystyrene (EPS) products — Specification*

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

BS EN ISO 6946 : 2007 *Building components and building elements — Thermal resistance and thermal transmittance — Calculation method*

BS EN ISO 9001 : 2008 *Quality management systems — Requirements*

BS EN ISO 14001 : 2004 *Environmental Management systems — Requirements with guidance for use*

BBA Information Bulletin No 3 *Reflective foil insulation — Conventions for U value calculations*

BRE Report (BR 262 : 2002) *Thermal insulation: avoiding risks*

BRE Report (BR 443 : 2006) *Conventions for U-value calculations*

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
- 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
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- 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:

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- any works and constructions in which the product/system is installed, including their nature, design, methods, performance, workmanship and maintenance
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- 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.

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