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BBA APPROVAL INSPECTION TESTING CERTIFICATION
TECHNICAL APPROVALS FOR CONSTRUCTION

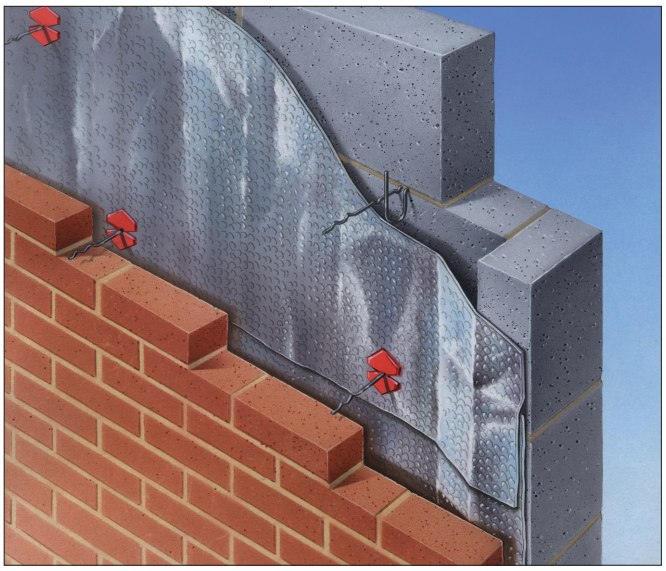
Agrément Certificate
93/2861
Product Sheet 1

ALREFLEX RANGE OF CAVITY WALL INSULATION AND CAVITY RAIN BARRIERS

ALREFLEX 2L2, ALREFLEX 2L1 AND ALREFLEX 2L2 SUPER 'R' CLASS 0

This Agrément Certificate Product Sheet(1) relates to Alreflex 2L2, Alreflex 2L1 and Alreflex 2L2 Super 'R' Class 0. Alreflex 2L2 is a two-layer polyethylene bubble sheet faced on both sides with a coated aluminium foil and Alreflex 2L1 and Alreflex 2L2 Super 'R' Class 0 are single-layer bubble sheets, faced on both sides with a coated aluminium foil, all being for use as thermal insulation and a rain barrier in masonry cavity walls in new domestic and non-domestic buildings with a nominal residual cavity of 50 mm and without height restriction.

(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 products have an emissivity of 0.03 for the outer foil and a thermal resistance of 0.09 $m^2 \cdot K \cdot W^{-1}$ for the bubble sheet for Alreflex 2L1 and Alreflex 2L2 Super 'R' Class 0, and of 0.19 $m^2 \cdot K \cdot W^{-1}$ for Alreflex 2L2 (see section 6).

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

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

Behaviour in relation to fire — the use of the products does not prejudice the fire resistance properties of the wall. Alreflex 2L2 and 2L1 are classified as Class 1 and Alreflex 2L2 Super "R" Class 0 is classified as Class 0/'low risk' regarding the reaction to fire performance (see section 9).

Durability — the products will have a life equivalent to that of the wall structure in which they are incorporated (see section 12).

The BBA has awarded this Certificate to the company named above for the products described herein. These products have been assessed by the BBA as being fit for their intended use provided they are installed, used and maintained as set out in this Certificate.

On behalf of the British Board of Agrément

Date of Second issue: 23 January 2015

Originally certificated on 27 November 2001

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 2L2, Alreflex 2L1 and Alreflex 2L2 Super 'R' Class 0, if installed, used and maintained in accordance with this Certificate, can 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 products can contribute to satisfying this Requirement. See sections 9.1 and 9.5 of this Certificate.
Requirement:	**C2(a)**	**Resistance to moisture**
Comment:		The products can contribute to satisfying this Requirement. See section 7.1 of this Certificate.
Requirement:	**C2(b)**	**Resistance to moisture**
Comment:		The products can contribute to satisfying this Requirement. See section 7.2 of this Certificate.
Requirement:	**C2(c)**	**Resistance to moisture**
Comment:		The products 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 products can contribute to satisfying this Requirement. See sections 6.1, 6.3 and 6.4 of this Certificate.
Regulation:	**7**	**Materials and workmanship**
Comment:		The products are 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 products can contribute to satisfying these Regulations although compensating fabric and/or services measures may need to be taken. See section 6.3 of this Certificate.

The Building (Scotland) Regulations 2004 (as amended)

Regulation:	**8(1)**	**Durability, Workmanship and Fitness of materials**
Comment:		The products are 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 products are 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 products 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 products 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 products 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 products 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 sections 6.1, 6.3 and 6.4 of this Certificate.
Standard:	7.1(a)(b)	Statement of sustainability
Comment:		The products 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 products 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 these products 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

Regulation:	**23**	**Fitness of materials and workmanship**
Comment:		The products are acceptable. See section 12 and the *Installation* part of this Certificate.

Regulation:	28(a)	Resistance to moisture and weather
Comment:		The products can contribute to satisfying this Regulation. See section 7.1 of this Certificate.
Regulation:	28(b)	Resistance to moisture and weather
Comment:		The products can contribute to satisfying this Regulation. See section 7.2 of this Certificate.
Regulation:	29	Condensation
Comment:		The products can contribute to satisfying this Regulation. See section 8.3 of this Certificate.
Regulation:	35(4)	Internal fire spread — Structure
Comment:		The products 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 products can contribute to satisfying these Regulations. See sections 6.1, 6.3 and 6.4 of this Certificate.

Construction (Design and Management) Regulations 2007

Construction (Design and Management) Regulations (Northern Ireland) 2007

In the opinion of the BBA, there is no information in this Certificate which relates to the obligations of the client, CDM co-ordinator, designer and contractors under these Regulations.

Additional Information

NHBC Standards 2014

In the opinion of the BBA, and subject to a 50 mm minimum residual cavity being maintained, NHBC accepts the use of the Alreflex 2L2, Alreflex 2L1 and Alreflex 2L2 Super 'R' Class 0, as insulation for partial fill cavity walls, provided they are installed, used and maintained in accordance with this Certificate, in relation to *NHBC Standards*, Chapter 6.1 *External masonry walls*.

Technical Specification

1 Description

1.1 Alreflex 2L2 consists of two layers of polyethylene bubble sheet manufactured with a coated aluminium foil-lining on both sides.

1.2 Alreflex 2L1 and Alreflex 2L2 Super 'R' Class 0 consists of one layer of polyethylene bubble sheet manufactured with a coated aluminium foil-lining on both sides.

1.3 The nominal characteristics of the products are given in Table 1.

Table 1 Nominal characteristics

Product	Length (m)	Width (m)	Thickness (mm)	Closing tape colour
2L2	25	1.05 1.2 1.5	6.5	red
2L2 Super 'R' Class 0	50	1.05 1.2	3.0	green
2L1	50	1.05 1.2 1.5	3.25	yellow

2 Manufacture

2.1 Aluminium foil is laminated to the back of the polyethylene bubble sheet(s), and at a preset point, a third layer of the low density material is laminated and a flat surface is given to both sides.

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 products are delivered to site in rolls. Each roll is sealed with adhesive tape bearing the manufacturer's name, basic application details and the BBA identification mark incorporating the number of this Certificate. Within each wall-tie box there is a leaflet giving basic installation instructions.

3.2 The products should be stored off the ground and under cover to protect them from precipitation and in clean and dry conditions. Damaged products should be discarded.

Assessment and Technical Investigations

The following is a summary of the assessment and technical investigations carried out on Alreflex 2L2, Alreflex 2L1 and Alreflex 2L2 Super 'R' Class 0.

Design Considerations

4 General

4.1 Alreflex 2L2, Alreflex 2L1 and Alreflex 2L2 Super 'R' Class 0 are used to reduce the thermal transmittance (U value) and provides a rain barrier 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). It is essential that such walls are designed and constructed to incorporate the normal precautions to prevent moisture penetration. The product can be installed in such a way that it sits within the nominal residual 50 mm cavity.

4.2 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.

4.3 Other new buildings not subject to these Regulations should also be built in accordance with the Standards listed in section 4.2 of this Certificate.

4.4 The Certificate holder can advise on suitable insulation retaining fixings and compatible wall ties for use with the products. These items are outside the scope of this Certificate.

4.5 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 and their respective National Annex's.

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

4.7 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 up to and including 12 metres in height

4.8 The residual cavity width (between the outer face of the products and the external leaf) to be maintained during construction must be a minimum of 50 mm. To achieve this requirement, a greater nominal residual cavity width may need to be specified at the design stage to allow for inaccuracies inherent in the building process. The specifier must:

- design a nominal residual cavity width of 50 mm (a residual cavity nominally at least 50 mm wide will be required by the NHBC), or
- design a cavity width which takes into account the dimensional tolerances of the components which make up the wall (by reference to the British Standards relating to the bricks, blocks and boards, or by using the data from their respective manufacturers). Allowances may need to be made for the quality of building operatives and the degree of site supervision or control available. The limitations in respect of exposure of the proposed building as set out in Table 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 : 2005) • slate hanging • timber, plastic or metal weatherboarding or cladding	No restriction
One or more external masonry walls constructed from facing clay brickwork or natural stone, the porosity of which exceeds 20% by volume. Mortar joints must be flush pointed or weatherstruck	100
One or more external masonry walls constructed from calcium silicate bricks, concrete blocks, reconstituted stone, or natural stone the porosity of which is less than 20% by volume, or any material with raked mortar joints	88

(1) Based upon the approach in BS 5618 : 1985.

Buildings over 12 metres in height

4.9 The width of the residual clear cavity to be achieved is to be in excess of 50 mm, and the following requirements apply:

- from ground level the maximum height of continuous cavity walls must not exceed 12 metres; above 12 metres the maximum height of continuous cavity walls must not exceed 7 metres. 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 products
- where, for structural reasons, the cavity width is reduced, eg by the intrusion of ring beams, a minimum residual cavity width of 25 mm must be maintained and extra care must be taken with fixings and weatherproofing, eg the inclusion of cavity trays with weepholes.

5 Practicability of installation

The products are designed to be installed by a competent general builder, or a contractor, experienced with these types of products.

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 following data:

- 0.03 outer surface emissivity of the products
- 0.19[1] $m^2 \cdot K \cdot W^{-1}$ core *R* value of the bubble wrap for 2L2
- 0.09[1] $m^2 \cdot K \cdot W^{-1}$ core *R* value of the bubble wrap for 2L1 and 2L2 Super 'R' Class 0.
- 0.71[1][2] $m^2 \cdot K \cdot W^{-1}$ *R* value of an air cavity adjacent to the products ≥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 the BBA Information Bulletin No 3.

6.2 For certain constructions, in order to meet the limiting fabric parameters of the national Building Regulations, it will be necessary to incorporate additional insulation material in the wall construction. The U value of a completed wall will then depend on the selected additional insulation thickness, number and type of fixings, the insulating value of the substrate masonry and its internal finish.

6.3 Some calculated U values for example constructions without additional insulation, are given in Table 3.

Table 3 Typical cavity wall U[1] values ($W \cdot m^{-2} \cdot K^{-1}$)

Product	Aerated concrete Block λ = 0.12 ($W \cdot m^{-1} \cdot K^{-1}$) density = 400 $kg \cdot m^{-3}$	Medium concrete block λ = 0.32 ($W \cdot m^{-1} \cdot K^{-1}$) density = 1300 $kg \cdot m^{-3}$	Dense concrete block λ = 1.13 ($W \cdot m^{-1} \cdot K^{-1}$) density = 1800 $kg \cdot m^{-3}$
Alreflex 2L1/2L2 Super 'R'	0.40	0.47	0.52
Alreflex 2L2	0.38	0.45	0.49

(1) The above U value calculations are based on the following:
— cavity wall ties — mild steel, 2.5 per m^2, 3.30 mm^2 cross-section
— 102 mm brick with conductivity 0.77 ($W \cdot m^{-1} \cdot K^{-1}$)
— 50 mm low emissivity cavity facing the inner surface of the external leaf
— 22 mm low emissivity cavity facing the inner surface of the internal leaf
— 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 ($W \cdot m^{-1} \cdot K^{-1}$)
— 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 ($W \cdot m^{-1} \cdot K^{-1}$).

6.4 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 products are used in situations where they bridge 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:

England and Wales — Approved Document C, section 5

Scotland — Mandatory Standard 3.4, clauses 3.4.1[1][2] and 3.4.5[1][2]

(1) Technical Handbook (Domestic).

(2) Technical Handbook (Non-Domestic).

Northern Ireland — Technical Booklet C, Sections 6.3 to 6.6.

7.2 Constructions incorporating the products, 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:

England and Wales — Approved Document C, section 5

Scotland — Mandatory Standard 3.10, clauses 3.10.1[1][2] and 3.10.3[1][2]

(1) Technical Handbook (Domestic).

(2) Technical Handbook (Non-Domestic).

Northern Ireland — Technical Booklet C, section 6.

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

- cavity wall ties are installed correctly and 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
- any additional 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.

8 Condensation

Surface condensation

8.1 Walls incorporating the products 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 6.4 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 6.4 of this Certificate.

Interstitial condensation

8.3 Walls incorporating the products 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 bubble sheet has a nominal vapour resistance exceeding 125 $MN \cdot s \cdot g^{-1}$ and hence providing a significant resistance to water vapour transmission.

8.5 If the products are 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.

9 Behaviour in relation to fire

9.1 The products have the following reaction to fire classifications when tested on the foil-face:

- Alreflex 2L2: Class 1
- Alreflex 2L1: Class 1
- Alreflex 2L2 Super 'R' Class 0: Class 0/'low risk'.

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 products are 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 they are 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 products 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 products 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 products are confined within the wall cavity and have suitable durability (see section 12), maintenance is not required.

12 Durability

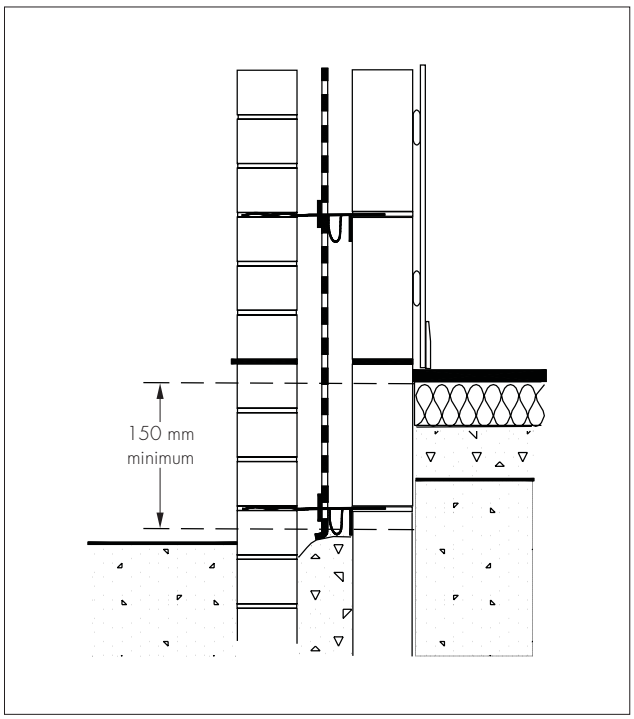
The products are unaffected by the normal conditions found in a wall construction, and they are durable, rot-proof, water resistant and sufficiently stable to remain effective as insulation for the life of the building.

Installation

13 General

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 this will ensure the laps are weathered to the outside (see Figure 1).

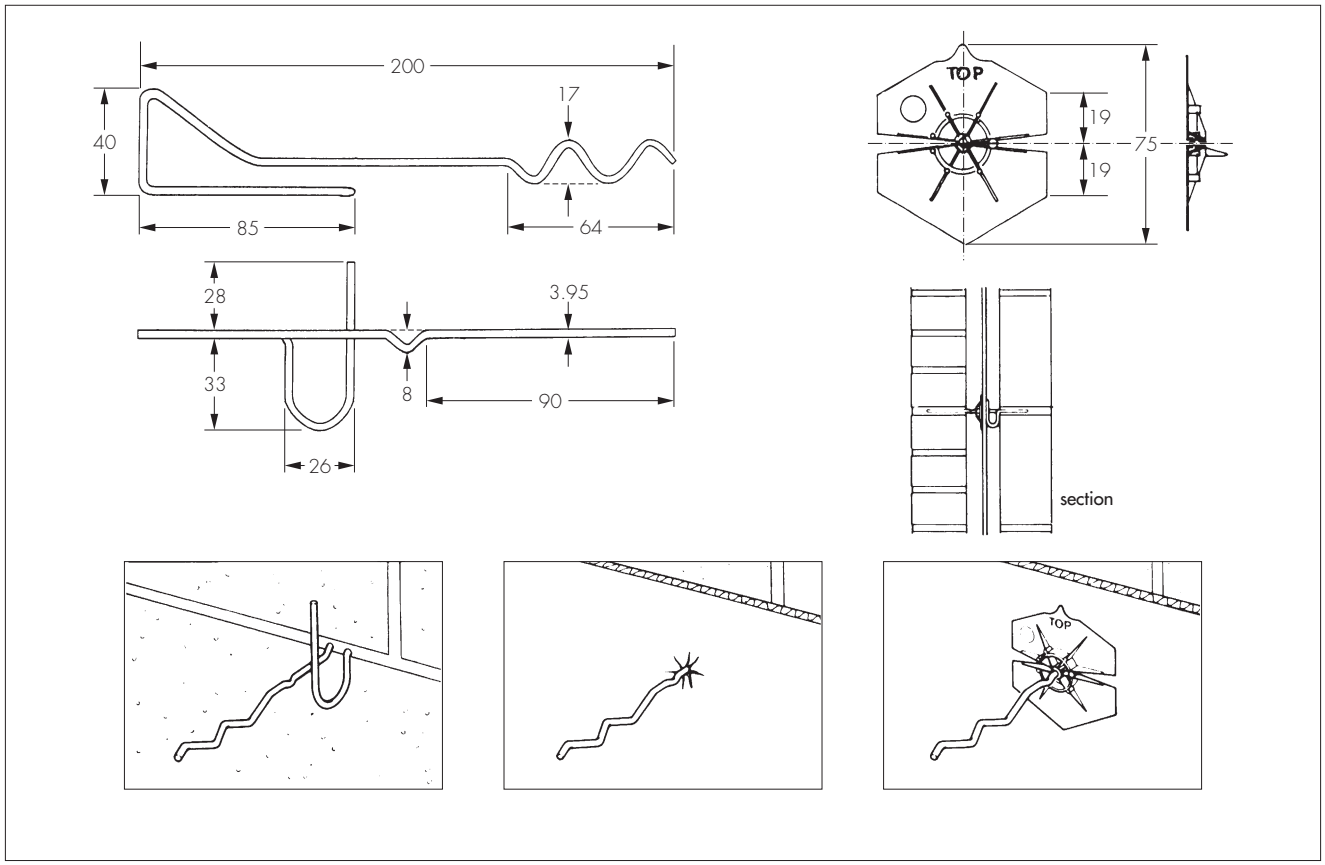
Figure 1 Typical installation detail



14 Procedure

14.1 Walls are constructed in the conventional manner with the first run of wall ties as near as possible to, though not directly on, the dpc. A section of the inner leaf of the wall is built up using wall ties (see Figure 1) to a height of approximately 1.5 metre to accommodate an initial run of products of the appropriate width. For this initial run (lane), wall ties should be installed in the first, third, fourth and sixth block bed joint at 900 mm horizontal centres. The ties are installed with the triangular end embedded in the mortar and the downstand loop butted against the cavity face of the leaf. Any mortar extrusions must be removed before setting. The leaf should be left for a minimum of eight hours so that, when the products are pushed over the ties, sufficient strength has developed to prevent disturbance of the ties and damage to the walls.

Figure 2 Cavity wall tie and clip for use with Alreflex (all dimensions in mm)



14.2 The time required to develop adequate strength will vary depending on several factors, such as type of masonry, mortar, or weather conditions.

14.3 When the first leaf has developed sufficient strength the products are fixed in a horizontal lane. The top edge of the foil should be aligned 75 mm above the top row of wall ties to create a weathered lap. The products should be fixed at one end and then stretched out along the wall and pushed over the wall ties.

14.4 It is preferable for two people to carry out this operation; one to maintain tension and the other to push the products over the ties.

14.5 The products are held in position against the loops in the wall ties by the plastic clips pushed onto the ties (see Figure 2). A check should be made to ensure that the gap between the material and the inner leaf is maintained.

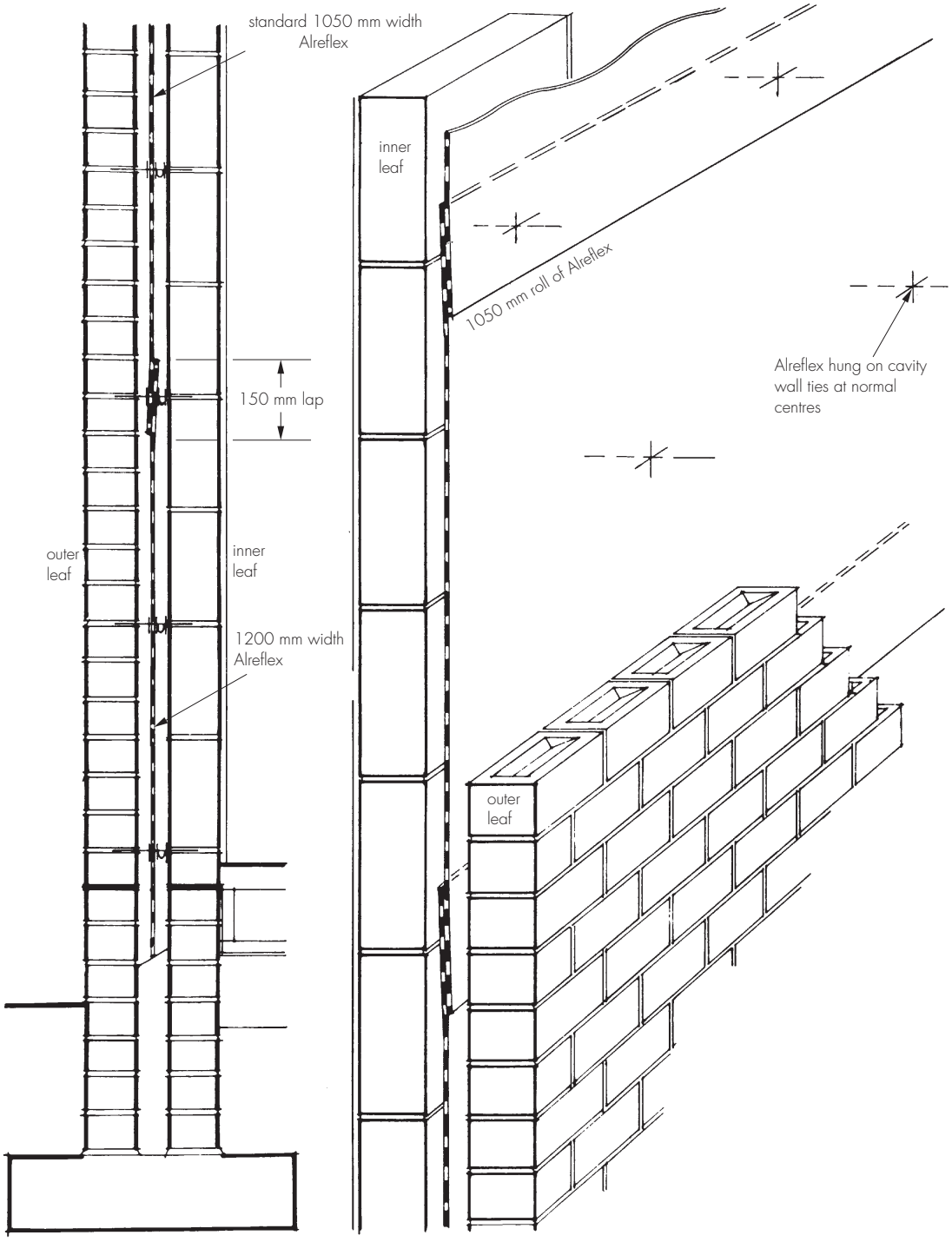
14.6 After the initial run of the products have been installed, the second leaf is built up to one course below the uppermost row of wall ties leaving room for the installation of the following run. The first leaf is raised by approximately 1.2 metres to accommodate the next run of the products. The wall ties are installed at 450 mm vertical centres and 900 mm horizontal centres. The products are installed applying the same techniques as for the initial run. The construction sequence incorporating the appropriate widths of the products is repeated up to the required height.

14.7 A lap of 150 mm, weathered to the outside, must be incorporated on the wall ties between successive lanes. The correct weathering will occur automatically if the inner leaf is built up first. If for other reasons it is essential to build the outer leaf first, then the top of the products should not be clipped but folded back. After the lane above is clipped in position, it can be straightened and clipped over the bottom edge of the upper lane, creating a weathered lap. Close supervision of this installation method should be observed.

14.8 Localised contact with one leaf is permitted but must be kept to a minimum.

14.9 The lowest lane of foil may be allowed to protrude below dpc level to provide some edge insulation for the floor. Where two lanes abut, they must be fixed with an overlap of 150 mm and the ties pushed through the core of the overlap (see Figure 3).

Figure 3 Alreflex installed in cavity

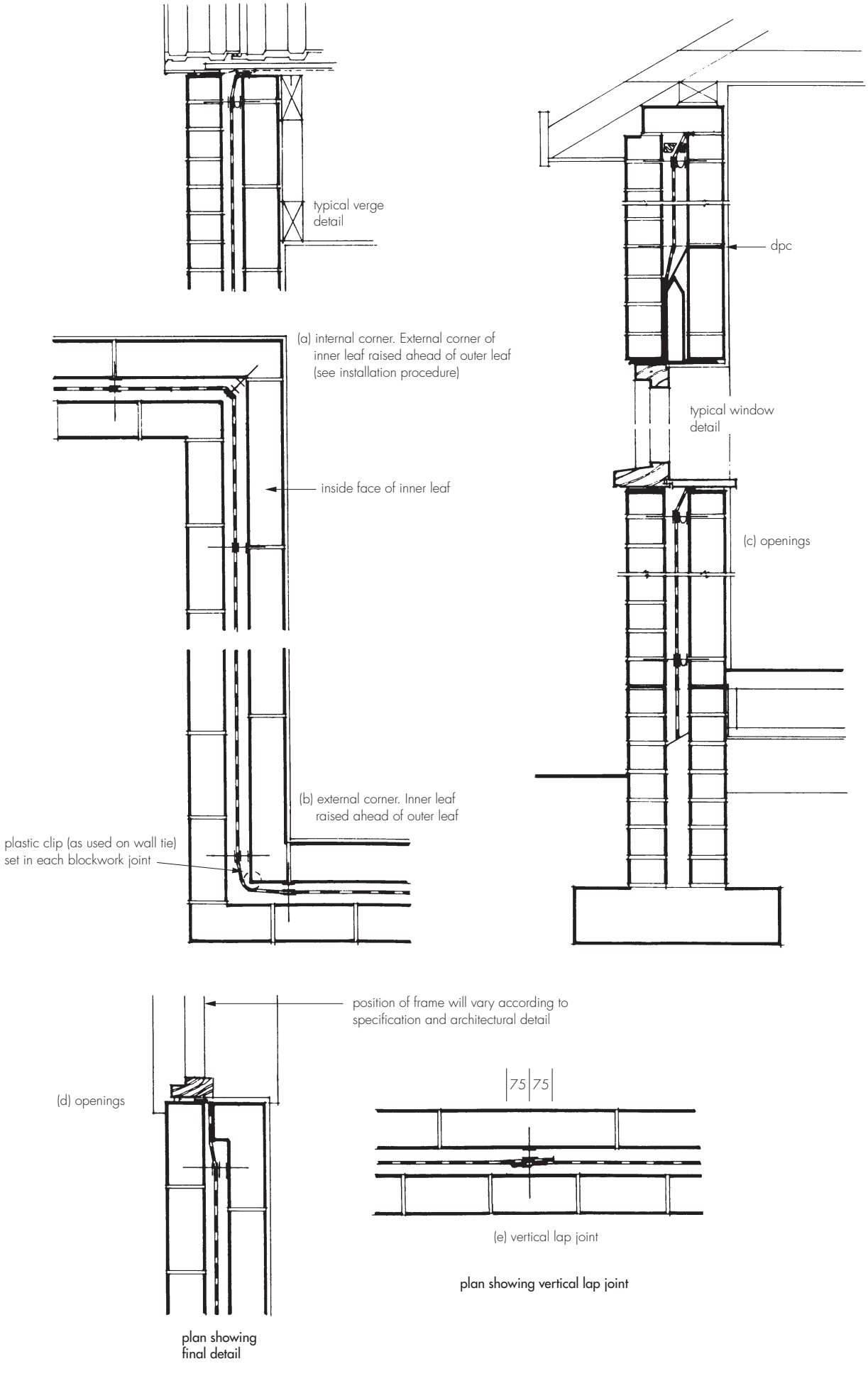


Note:
These details outline the installation procedure only and should not be read as implying that the inner leaf has to be built first. Construction can also begin with the outer leaf although care must be taken to lap the Alreflex to the outside of the building as shown.

14.10 At external corners, the products are spaced away from the inner leaf by bedding the plastic clips, at regular intervals, into the mortar. At internal corners, special ties, formed by cutting 95 mm from the 'free' end of standard ties, are used to hold the products in position [see Figures 4(a) and 4(b)].

14.11 The foil can be easily cut with a sharp knife or scissors to fit windows, doors and apertures. Where the foil meets a window or door frame it should be fixed to the jambs and cut off (see Figure 4). The products may be used to provide some insulation at joints (see section 6.4). Care should be taken to avoid bringing the foil into contact with the inner leaf (see section 14.7). Fixing at the tops of walls depends on the method used to seal the cavity; the material can be dressed under the cavity closer (see Figure 4c) or, where appropriate, weathered to a cavity tray. Where vertical joints occur in the material, they should be formed on wall ties with a 150 mm vertical lap (see Figure 4).

Figure 4 Fixing details (dimensions in mm)



15 Investigations

15.1 Tests and assessment were carried out Alreflex 2L2, Alreflex 2L1 and Alreflex 2L2 Super 'R' Class 0 to determine:

- polymer characteristics
- ageing characteristics
- emissivity
- thermal resistance.

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

Bibliography

BS 5250 : 2011 *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*

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16 Conditions

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- 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
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