



Lite Pac Limited

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**Agrément
Certificate
No 95/3205/C**
Second issue*

Designated by Government
to issue
European Technical
Approvals

LITE PAC CAVITY WALL INSULATION

Isolant en polystyrène expansé pour murs creux
Kerndämmung

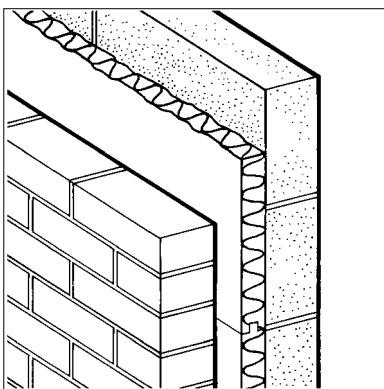
Product

• THIS CERTIFICATE OF CONFIRMATION RELATES TO LITE PAC CAVITY WALL INSULATION, AN EXPANDED POLYSTYRENE BOARD FOR CAVITY WALL INSULATION.

• The product is for use in buildings up to 12 metres in height, and in buildings over 12 metres and up to 25 metres in height, subject to the conditions contained in the Design Data part of this Certificate.

• The product is installed during construction and is for use as a partial fill board to reduce the thermal transmittance of cavity walls with masonry inner and outer leaves.

• It is essential that the walls are built in accordance with the conditions set out in the Design Data and Installation parts of this Certificate.



Confirmation of an Agrément Certificate issued by the Irish Agrément Board, FORBAIRT, Glasnevin, Dublin 9, Ireland.

Building Regulations

1 The Building Regulations 1991 (as amended 1994) (England and Wales)

The Secretary of State has agreed with the British Board of Agrément the aspects of performance to be used by the BBA in assessing the compliance of cavity wall insulation with the Building Regulations. In the opinion of the BBA, Lite Pac Cavity Wall Insulation, if used in accordance with the provisions of this Certificate, will meet or contribute to meeting the relevant requirements.

Requirement: B3(4)

Internal fire spread (structure)

Comment:

Walls constructed using the product meet this Requirement provided the completed walls comply with the conditions set out in sections 7.1 and 7.2 of this Certificate.

Requirement: C4

Resistance to weather and ground moisture

Comment:

Data obtained by the BBA indicate that a wall incorporating the product meets this Requirement, provided the completed wall complies with the conditions set out in sections 6.2 and 6.4 to 6.6 of this Certificate. The product does not absorb water by capillary action and therefore may be used in situations where it bridges the dpc of the inner or outer leaf. See sections 9.3 and 9.4 of this Certificate.

Requirement: L1

Conservation of fuel and power

Comment:

It can be shown from example calculations that the masonry cavity wall construction with plaster, Example 7 in Appendix A of Approved Document L, will achieve a U value of $0.45 \text{ Wm}^{-2}\text{K}^{-1}$, and satisfy this Requirement, where a minimum 48 mm thickness of SD grade board is used. See sections 11.2 to 11.4 of this Certificate.

Requirement: Regulation 7

Materials and workmanship

Comment:

The product is acceptable. See section 12 of this Certificate.

2 The Building Standards (Scotland) Regulations 1990 (as amended)

In the opinion of the BBA, Lite Pac Cavity Wall Insulation, if used in accordance with the provisions of this Certificate, will satisfy or contribute to satisfying the various Regulations and Technical Standards as listed below.

Regulation: 10

Fitness of materials

Standard: B2.1

Selection and use of materials and components

Comment:

The product is an acceptable material.

Regulation: 12

Structural fire precautions

Standard: D2.3

Non-combustibility

Comment:

The product is combustible and its use is restricted by this Standard in buildings other than dwellings or shared accommodation. However, in the opinion of the BBA, the product is suitable for use in all purpose groups provided it is installed in accordance with this Certificate. See section 7.1 of this Certificate.

Standards: D2.19-D2.21

Cavity barriers

Comment:

A wall containing the product must comply with these Standards. See section 7.3 of this Certificate.

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<p>Regulation: 17 Standard: G2.6 Comment:</p>	<p>Preparation of sites and resistance to moisture Resistance to moisture from the ground The product does not absorb water by capillary action and therefore may be used where it bridges the dpc of the inner or outer leaf. See section 9.6 of this Certificate.</p>
<p>Standard: G3.1 Comment:</p>	<p>Resistance to precipitation Data obtained by the BBA indicate that a wall incorporating the product can satisfy this Regulation provided it complies with sections 6.2 and 6.4 to 6.6 of this Certificate. See also sections 9.3 and 9.5.</p>
<p>Regulation: 22 Standard: J2.2 Comment:</p>	<p>Conservation of fuel and power Performance standards It can be shown from example calculations that any masonry cavity wall construction described in the table to wall type 2C in the deemed-to-satisfy provisions for Part J will achieve a U value of $0.45 \text{ Wm}^{-2}\text{K}^{-1}$, and satisfy this Standard, where a minimum 61 mm thickness of SD grade board is used. See sections 11.2 and 11.3 of this Certificate.</p>

3 The Building Regulations (Northern Ireland) 1994 (as amended 1995)



In the opinion of the BBA, Lite Pac Cavity Wall Insulation, if used in accordance with the provisions of this Certificate, will satisfy or contribute to satisfying the various Building Regulations as listed below.

<p>Regulation: B2 Comment:</p>	<p>Fitness of materials and workmanship The product is acceptable. See section 12 of this Certificate.</p>
<p>Regulation: C5 Comment:</p>	<p>Resistance to ground moisture and weather Data obtained by the BBA indicate that a wall incorporating the product can satisfy this Regulation provided it complies with sections 6.2 and 6.4 to 6.6 of this Certificate. See also sections 9.3 and 9.5. The system does not absorb water by capillary action and therefore may be used where it bridges the dpc of the inner or outer leaf. See section 9.6 of this Certificate.</p>
<p>Regulation: E6 Comment:</p>	<p>Internal fire spread — Structure The product may be used in buildings where compliance with Diagram 3.5 in Technical Booklet E is achieved. See sections 7.1 and 7.2 of this Certificate.</p>
<p>Regulation: F2 Comment:</p>	<p>Conservation of fuel and power It can be shown from example calculations that any cavity masonry construction, Wall Type 2C described in Technical Booklet F, will achieve a U value of $0.45 \text{ Wm}^{-2}\text{K}^{-1}$, and satisfy this Regulation, where a minimum 64 mm thickness of SD grade board is used. See sections 11.2 and 11.3 of this Certificate.</p>

Technical Specification

4 Description

4.1 Lite Pac Cavity Wall Insulation boards are manufactured from expandable polystyrene boards. Each board incorporates a tongue on one long edge and a groove on the other. The short edges are also formed in this way, enabling the boards to interlock when installed.

4.2 The boards are manufactured to sizes and grades as follows:

length (mm)	1200
width (mm)	400, 450
thickness (mm)	40, 50, 60, 75 and 100
grade	SD A or N HD A or N EHD A or N UHD A or N

4.3 Tests on the finished product include:

- density
- dimensional accuracy
- dimensional stability
- compressive strength
- thermal conductivity.

4.4 Only insulation retaining fixings approved by the BBA should be used with this system. Names and addresses of suppliers of approved fixings are available from Lite Pac Limited or the BBA.

4.5 It should be noted that while approved ties are suitable for use for insulation retaining purposes, additional vertical twist ties to BS 1243 : 1978 may be required for structural stability in accordance with BS 5628 : Part 3 : 1985 where the overall cavity width exceeds 75 mm.

5 Delivery and site handling

5.1 The boards are delivered to site in packs of 18 wrapped in polythene. Each board bears the manufacturer's name and product description and each pack carries a label with instructions on storage and installation and the BBA identification mark incorporating the number of this Certificate.

5.2 The boards must be protected from prolonged exposure to sunlight and should be stored either under cover or protected with opaque polythene. Care must be taken to avoid contact with solvents and with materials containing volatile organic components such as coal tar, pitch, timber newly treated with creosote, etc.

5.3 The boards must not be exposed to open flame or other ignition sources.

Design Data

6 General

6.1 When installed in accordance with this Certificate, Lite Pac Cavity Wall Insulation will be effective in reducing the U value (thermal transmittance) of new external cavity walls with masonry inner and outer leaves (where masonry includes clay and calcium silicate bricks, concrete blocks⁽¹⁾, natural and reconstituted stone blocks). It is essential that such walls are designed and constructed to incorporate the precautions given in this Certificate to prevent moisture penetration.

(1) includes aircrete blocks.



6.2 Buildings subject to the Building Regulations defined in sections 1 to 3 should be constructed in accordance with the relevant recommendations of BS 5628 : Part 3 : 1985. In particular clause 21 of the Code of practice should be followed in that the designer should select a construction appropriate to the local wind-driven rain index paying due regard to the design detailing, workmanship and materials to be used. The relevant recommendations of Section 3 of BS 5390 : 1976(1984) should be followed where the wall incorporates stone or cast stone.

6.3 Other buildings not subject to any of these regulations should also be built in accordance with BS 5628 : Part 3 : 1985 and/or BS 5390 : 1976(1984).



6.4 Where a residual cavity width of 50 mm or greater is maintained the boards can be used in any exposure zone. However, use of the system 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.

6.5 Where the walls of a building are to be 12 metres high or less, the minimum residual cavity width to be maintained during construction must be 25 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 may either:

(1) design a cavity width by consideration of 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 use the data from their respective manufacturers. In addition, allowance may need to be made for the quality of available building operatives and the degree of site supervision or control; or

(2) design a nominal residual cavity width of 50 mm (a residual cavity nominally 50 mm wide will be required by the NHBC, etc where normal standards of tolerance and workmanship are adopted).

6.6 The size of residual cavity obtained in the processes described in section 6.5 is also subject to the following limitations given in section 6.7 regarding exposure of the proposed building as set out in Table 1 (see also section 9.1 for guidance on how exposure factor E is determined).

6.7 Where the walls of a building are between 12 and 25 metres high the width of residual clear cavity to be achieved is to be in excess of 50 mm, and the following requirements apply:

(1) 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.

(2) The specifier must take care when detailing to ensure that the introduction of the insulation does not affect the weather resistance of the wall. More than average site supervision is recommended during the installation of the product.

(3) The exposure factor does not exceed 120.

(4) 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 inclusion of a cavity tray.

Table 1 Maximum allowable total exposure factors of different constructions

Construction	Maximum allowable exposure factor E
All external masonry walls protected by: rendering (to BS 5262 : 1991) tile hanging 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% volume, or any material with raked mortar joints.	88

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

6.9 As with all cavity wall insulation, the construction detailing should comply with good practice as described in the BBA joint publication *Cavity Insulation of Masonry Walls — Dampness Risks and How to Minimise Them*.

7 Behaviour in relation to fire



7.1 Use of the boards does not prejudice the fire resistance properties of the wall. They are unlikely to become ignited within the cavity when used in the context of this Certificate. 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.



7.2 When using the boards, the requirements of the Building Regulations 1991 (as amended 1994) (England and Wales) and the Building Regulations (Northern Ireland) 1994 (as amended 1995) relating to fire spread in cavity walls can be met in all purpose groups without the need for cavity barriers provided the walls are constructed in accordance with the following provisions (based on Approved Document B, Diagram 28 and Technical Booklet E, Diagram 3.5, respectively, and the note to those diagrams):

- (1) the wall must consist of masonry inner and outer leaves, each at least 75 mm thick
- (2) the cavity must not be more than 100 mm wide
- (3) the cavity must be closed at the top of the wall and at the top of any opening
- (4) in addition to the insulation only the following combustible materials should be placed in, or exposed to, the cavity:
 - (a) timber lintels, window or door frames, or the end of timber joists
 - (b) pipe, conduit or cable
 - (c) dpc, flashing, cavity closer or wall tie
 - (d) domestic meter cupboard provided there are not more than two cupboards to a dwelling, the opening in the outer leaf is not more than 800 mm by 500 mm for each cupboard, and the inner leaf is not penetrated except by a sleeve not more than 80 mm by 80 mm, which is fire-stopped.



7.3 For those constructions subject to the Building Standards (Scotland) Regulations 1990 (as amended), no cavity barriers are required provided the wall complies with the provisions of Technical Standard D2.19 for compliance with these Regulations.

8 Proximity of flues and appliances

When the product is installed in close proximity to certain flue pipes and/or heat-producing appliances, the following provisions should be met:

(1) In buildings subject to the Building Regulations 1991 (as amended 1994) (England and Wales), the relevant clauses in Approved Document J.

(2) In buildings subject to the Building Standards (Scotland) Regulations 1990 (as amended) the relevant Technical Standards within Part F for compliance with these Regulations.

(3) In buildings subject to the Building Regulations (Northern Ireland) 1994 (as amended 1995) the requirements of Regulation L2. Guidance is given in Technical Booklet L on ways in which this Regulation may be satisfied.

9 Liquid water penetration

9.1 The requirements to resist rain penetration in terms of exposure are defined in section 6 of this Certificate. The exposure factor E is determined using BBA Information Sheet No 10 *Methods of Assessing the Exposure of Buildings for Cavity Wall Insulation* in conjunction with BRE Report *Driving Rain Index* by R E Lacy, 1976. These calculations, procedure and data are also reproduced in BS 5618 : 1985.

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

- (1) wall ties and fixings are installed correctly and are thoroughly clean
- (2) excess mortar is cleaned from the cavity face of the leading leaf and any debris removed from the cavity
- (3) mortar droppings are cleaned from the exposed edges of installed boards.
- (4) Installation is carried out to the highest level on each wall or the top edge of the insulation is protected by a cavity tray.



9.3 Data obtained by the BBA confirm that a masonry wall incorporating the product, built to the requirements of BS 5628 : Part 3 : 1985, will not transmit water to the inner leaf.



9.4 Data obtained by the BBA also demonstrate that the boards do not absorb water by capillary action; when the boards are used in situations where they bridge the dpc in walls, dampness from the ground will not pass through provided the wall is detailed in accordance with the Technical Solution shown in 4.4(c) of Approved Document C of the Building Regulations 1991 (as amended 1994) (England and Wales).



9.5 Data obtained by the BBA confirm that provided the wall incorporating the product is built in accordance with BS 5628 : Part 3 : 1985, it can satisfy Technical Standard G3.1 for compliance with the Building Standards (Scotland) Regulations 1990 (as amended) and Regulation C5 of the Building Regulations (Northern Ireland) 1994 (as amended 1995).

9.6 Data obtained also show that the product will satisfy Technical Standard G2.6 for compliance with

the Building Standards (Scotland) Regulations 1990 (as amended) and Regulation C5 of the Building Regulations (Northern Ireland) 1994 (as amended 1995) where the boards bridge the damp-proof course in the inner or outer leaf.

10 Water vapour penetration

10.1 The boards have a vapour resistivity in excess of $145 \text{ MNsg}^{-1}\text{m}^{-1}$ and will therefore provide a significant resistance to the passage of water vapour, and would be considered a vapour control layer as defined in Section 1 of BS 5250 : 1989(1995).

10.2 If the boards are to be used in the external walls of rooms expected to have high humidities, care must be taken to provide adequate permanent ventilation to avoid possible problems from the formation of interstitial condensation in the internal wall leaf.

11 Thermal insulation

11.1 For the purpose of U value calculations to determine if the requirements of the Building (or other statutory) Regulations are met, the thermal conductivity (λ value) of the boards should be taken as follows:

Grade	Thermal conductivity ($\text{Wm}^{-1}\text{K}^{-1}$)
SD	0.037
HD	0.035
EHD	0.033
UHD	0.033

11.2 The requirement for limiting the heat loss through the building fabric can be satisfied if the U values of the building elements do not exceed the maximum values in the relevant Elemental Approach given in:

- (a) Approved Document L of the Building Regulations 1991 (as amended 1994) (England and Wales), or
- (b) Part J of the Technical Standards for compliance with the Building Standards (Scotland) Regulations 1990 (as amended), or
- (c) Technical Booklet F to the Building Regulations (Northern Ireland) 1994 (as amended 1995).

11.3 These documents also give guidance on selecting the thickness of insulation required to enable a wall to achieve the desired U value. Alternative approaches are also described which allow for some flexibility in design of U values for individual constructional elements.

11.4 For constructions subject to the Building Regulations 1991 (as amended 1994) (England and Wales) the effect of thermal bridging should be taken into account in any U value calculations.

12 Durability

The boards are stable, rot-proof and durable, and will remain effective as an insulation system for the life of the building, providing they are installed in accordance with this Certificate.

Installation

13 General

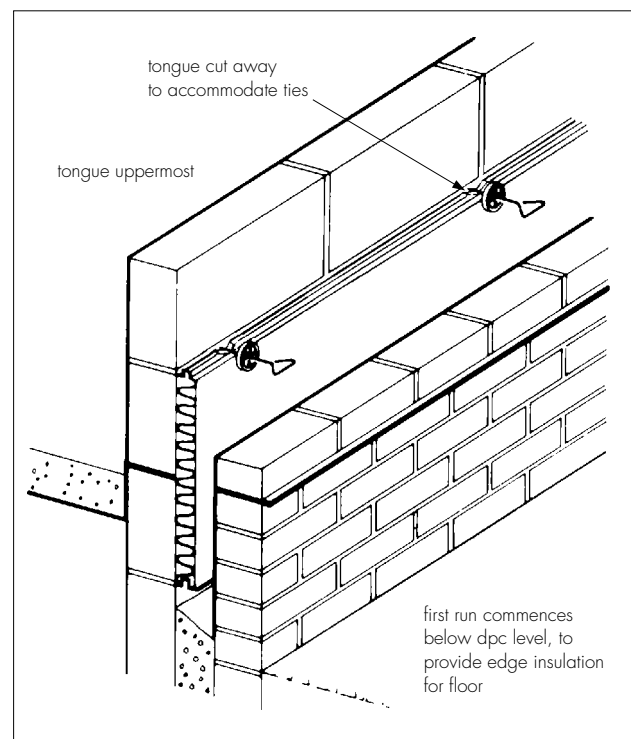
The walls are constructed leading with either the inner or outer leaf. It is recommended that the inner leaf is constructed ahead of the outer leaf, as Lite Pac Cavity Wall Insulation fastened to the cavity face of the inner leaf gives a slightly enhanced thermal performance.

14 Procedure

14.1 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. It is recommended that the wall ties are not placed directly on the damp-proof course. The first run of boards may commence below damp-proof course level to provide some edge insulation for the floor (see Figure 1).

14.2 The leading leaf is built up to a height of 450 mm. Excess mortar is cleaned from the cavity face of the leading leaf, and the boards are placed on the wall ties. The boards are placed with the tongue edge uppermost, for interlocking with the groove edges of the next run of boards. The boards should be carefully notched with a sharp knife or fine-toothed saw to accommodate the wall ties (see Figure 1).

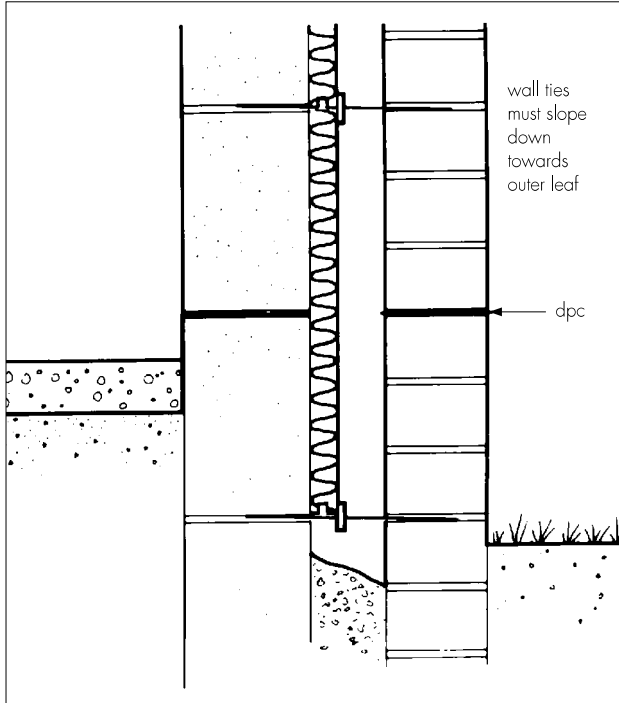
Figure 1 Lite Pac installed below dpc level to provide edge insulation for floor



14.3 The second row of wall ties is placed, sloping 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. Additional ties may be required to satisfy the structural

requirements of BS 5628 : Part 3 : 1985, and/or to ensure adequate retention of boards or cut pieces.

Figure 2 Installation of wall ties



14.4 The other leaf is built up to the level of the top of the boards.

Mortar droppings

14.5 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 board, before installation of the next run of boards. Use of a cavity board is recommended to protect board edges and make cleaning easier. Also, a cavity batten will protect the installed boards and help to keep the cavity clean as the following leaf is built (see Figures 3 and 4).

Figure 3 Use of cavity batten

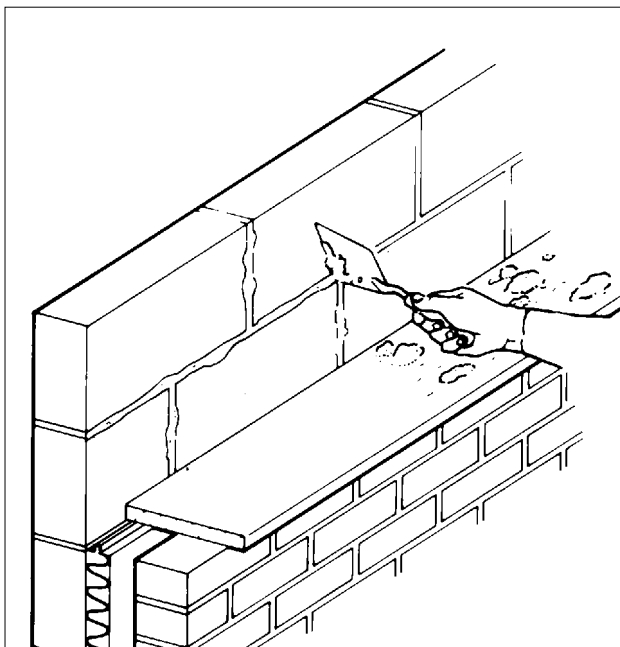
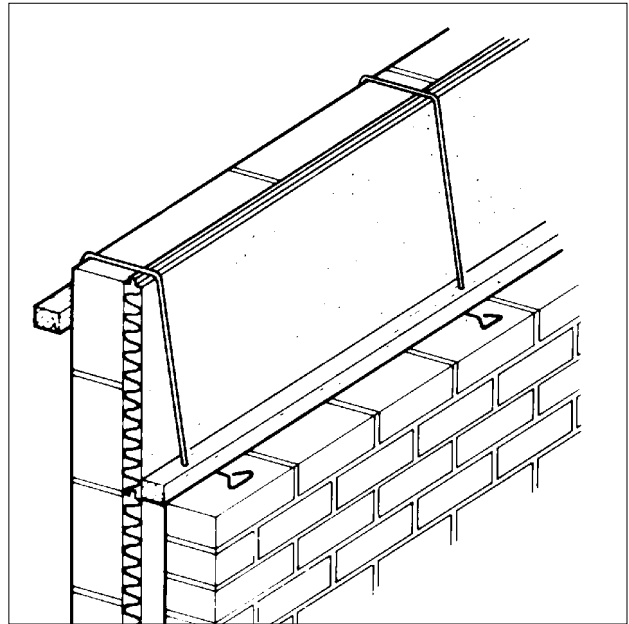


Figure 4 Use of cavity board



Cut pieces

14.6 The boards can be cut using a sharp knife or fine-toothed saw, to fit around windows, doors, air bricks, etc. 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

14.7 All building involving the system, particularly interrupted work, must conform to BS 5628 : Part 3 : 1985, Sections 4.30 *Storage on site*, 4.35 *Protection against damage*, and 4.36 *Supervision*.

Technical Investigations

The following is a summary of the technical investigations carried out on Lite Pac Cavity Wall Insulation.

15 Tests

As part of the assessment by the Irish Agrément Board, tests and assessments were carried out to determine:

- density
- dimensional accuracy
- water vapour resistance
- water absorption
- compressive strength
- cross-breaking strength
- dimensional stability
- thermal conductivity
- efficiency of the construction process
- manufacturing and quality control procedures.

16 Other investigations

The technical data in the Agrément issued by the Irish Agrément Board were evaluated in the context of UK practice, conditions and Building Regulations.

Additional Information

The management systems of Lite Pac Limited have been assessed and registered as meeting the requirements of I.S. EN ISO 9002 : 1994, by the National Standards Authority of Ireland (Certificate No M310).

Bibliography

- BS 1243 : 1978 *Specification for metal ties for cavity wall construction*
- BS 5250 : 1989(1995) *Code of practice for control of condensation in buildings*
- BS 5262 : 1991 *Code of practice for external renderings*
- BS 5390 : 1976(1984) *Code of practice for stone masonry*
- 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 5628 *Code of practice for use of masonry*
Part 3 : 1985 *Materials and components, design and workmanship*
- I.S. EN ISO 9002 : 1994 *Quality systems — Model for quality assurance in production, installation and servicing*

Conditions of Certification

17 Conditions

17.1 Where reference is made in this Certificate to any Act of Parliament, Regulation made thereunder, Statutory Instrument, Code of Practice, British Standard, manufacturer's instruction or similar publication, it shall be construed as reference to such publication in the form in which it is in force at the date of this Certificate.

17.2 The quality of materials and the method of manufacture have been examined and found satisfactory by the BBA and must be maintained to this standard during the period of validity of this Certificate. This Certificate will remain valid for an unlimited period provided:

- (a) the specification of the product is unchanged; and
- (b) the product remains the subject of a valid Irish Agrément Certificate issued by the IAB.

17.3 This Certificate will apply only to the product that is installed, used and maintained as set out in this Certificate.

17.4 In granting this Certificate, the BBA makes no representation as to:

- (a) the presence or absence of patent or similar rights subsisting in the product; and
- (b) the legal right of the Certificate holder to market, install or maintain the product; and
- (c) the nature of individual installations of the product, including methods and workmanship.

17.5 It should be noted that any recommendations relating to the safe use of this product which are contained or referred to in this Certificate are the minimum standards required to be met when the product is used. They do not purport in any way to restate the requirements of the Health & Safety at Work etc Act 1974, or of any other statutory or Common Law duties of care, or of any duty of care which exist at the date of this Certificate or in the future; nor is conformity with such recommendations to be taken as satisfying the requirements of the 1974 Act or of any present or future statutory or Common Law duties of care. In granting this Certificate, the BBA does not accept responsibility to any person or body for any loss or damage, including personal injury, arising as a direct or indirect result of the use of this product.



In the opinion of the British Board of Agrément, Lite Pac Cavity Wall Insulation is fit for its intended use provided it is installed, used and maintained as set out in this Certificate. Certificate No 95/3205/C is accordingly awarded to Lite Pac Limited.

On behalf of the British Board of Agrément

A handwritten signature in black ink, appearing to read 'P. Q. Newman', is written over a light grey background.

Date of Second issue: 15th November 1996

Director

*Original Certificate issued 22nd January 1996. This amended version includes references to the revised Building Regulations and associated text (in particular section 7).

