

Warmfill Limited

Unit 5, Port of Larne Business Park
Redlands Road
Larne
BT40 1AX

Tel: 028 9042 8260 Fax: 028 9042 7641
e-mail: sales@warmfill.com
website: www.warmfill.com



Agrément Certificate
02/3938
Product Sheet 1

WARMFILL CAVITY WALL INSULATION

WARMFILL CAVITY WALL INSULATION FOR MASONRY CAVITY WALLS

PRODUCT SCOPE AND SUMMARY OF CERTIFICATE

This Certificate relates to Warmfill Cavity Wall Insulation for Masonry Cavity Walls, an expanded polystyrene material injected in bead form, with or without a bonding agent, for use in buildings up to and including 12 m in height. The product may also be used in buildings over 12 m in height where a height restriction waiver has been issued. It is used to reduce the thermal transmittance of completed, new or existing cavity walls with masonry inner and outer leaves.

AGRÉMENT 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

Practicability of installation — the product must only be installed by trained and approved operators (see section 4).

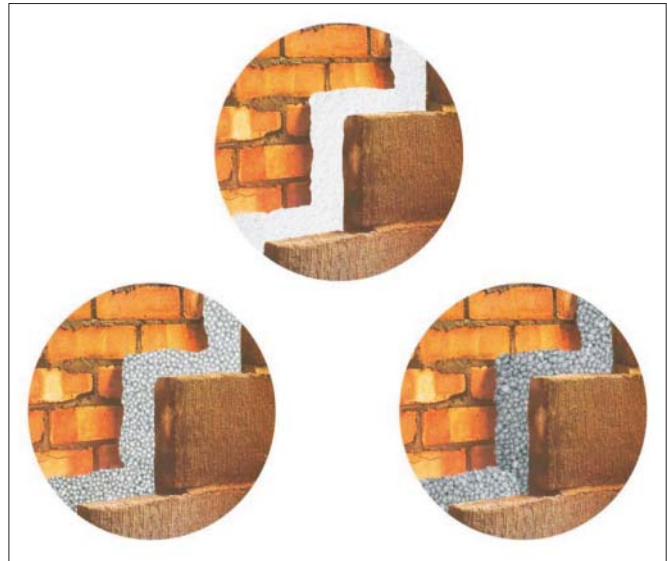
Thermal performance — the product has an estimated thermal conductivity of between $0.045 \text{ W}\cdot\text{m}^{-1}\cdot\text{K}^{-1}$ Warmfill (white bead) and $0.036 \text{ W}\cdot\text{m}^{-1}\cdot\text{K}^{-1}$ (Warmfill Super Silver) (see section 5).

Liquid water penetration — the product will not allow water to cross the wall construction via the insulation (see section 6).

Condensation risk — walls will limit the risk of condensation provided the conditions stated within this Certificate are met (see section 7).

Behaviour in relation to fire — use of the product does not prejudice the fire resistance properties of the wall (see section 8).

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



The BBA has awarded this Agrément 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

Chris Hunt
Head of Approvals — Physics

Greg Cooper
Chief Executive

Date of First issue: 12 October 2010

Originally certificated on 30 August 2002

Certificate amended on 07 August 2012 to include update of thermal conductivity values.

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.

British Board of Agrément
Bucknalls Lane
Garston, Watford
Herts WD25 9BA

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tel: 01923 665300
fax: 01923 665301
e-mail: mail@bba.star.co.uk
website: www.bbacerts.co.uk

Regulations

In the opinion of the BBA, Warmfill Cavity Wall Insulation for Masonry Cavity Walls, if used in accordance with the provisions of this Certificate, will meet or contribute to meeting the relevant requirements of the following Building Regulations:



The Building Regulations 2010 (England and Wales)

Requirement: B3(4)	Internal fire spread (Structure)
Comment:	Walls filled with the product meets this Requirement provided the wall complies with the conditions set out in sections 8.2 to 8.4 of this Certificate.
Requirement: C2(a)	Resistance to moisture
Comment:	The product does not absorb water by capillary action and may therefore be used in situations where it bridges the damp proof course (dpc) of the inner and outer leaf. See section 6.2 of this Certificate.
Requirement: C2(b)	Resistance to moisture
Comment:	Tests by the BBA indicate that a wall incorporating the product can resist rain penetration and satisfy this Requirement. See sections 3.6, 3.8, 6.2 and 6.3 of this Certificate.
Requirement: C2(c)	Resistance to moisture
Comment:	The product can contribute to satisfying this Requirement. See sections 7.1 and 7.3 of this Certificate.
Requirement: L1(a)(i)	Conservation of fuel and power
Comment:	The product can contribute to meeting this Requirement. See sections 5.2 to 5.3 of this Certificate.
Requirement: Regulation 7	Materials and workmanship
Comment:	The product is an acceptable material. See section 11 and the <i>Installation</i> part of this Certificate.



The Building (Scotland) Regulations 2004 (as amended)

Regulation: 8(1)	Fitness and durability of materials and workmanship
Comment:	The product can contribute to a construction satisfying this Regulation. See section 11 and the <i>Installation</i> part of this Certificate.
Regulation: 9	Building Standards – construction
Standard: 2.6	Spread to neighbouring buildings
Comment:	The product is combustible but it 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 8.4 and 8.5 of this Certificate.
Standard: 3.4	Moisture from the ground
Comment:	The product can contribute to a construction satisfying this standard with reference to clause 3.4.1 ⁽¹⁾⁽²⁾ . The product can be used in situations where it bridges the dpc of the inner and outer leaf. See section 6.2 of this Certificate.
Standard: 3.10	Precipitation
Comment:	The product will contribute to satisfying this standard with reference to clause 3.10.1 ⁽¹⁾ provided it complies with the conditions set out in sections 3.6 and 3.8 of this certificate. See also section 6.3 of this Certificate.
Standard: 3.15	Condensation
Comment:	The product can contribute to satisfying this standard, with reference to clauses 3.15.1 ⁽¹⁾ , 3.15.3 ⁽¹⁾ and 3.15.4 ⁽¹⁾ . See section 7.2 and 7.3 of this Certificate.
Standard: 6.1(b)	Carbon dioxide emissions
Standard: 6.2	Building insulation envelope
Comment:	The product can contribute to satisfying clauses 6.1.1 ⁽¹⁾ , 6.1.2 ⁽²⁾ , 6.1.6 ⁽¹⁾ , 6.2.1 ⁽¹⁾⁽²⁾ , 6.2.3 ⁽¹⁾ , 6.2.9 ⁽¹⁾ , 6.2.10 ⁽²⁾ and 6.2.11 ⁽¹⁾ . See sections 5.2 to 5.3 of this Certificate. (1) Technical Handbook (Domestic). (2) Technical Handbook (Non-Domestic).



The Building Regulations (Northern Ireland) 2000 (as amended)

Regulation: B2	Fitness of materials and workmanship
Comment:	The product is an acceptable material. See section 11 and the <i>Installation</i> part of this Certificate.
Regulation: C4(a)(b)	Resistance to ground moisture and weather
Comment:	Tests by the BBA indicate that a wall incorporating this product can satisfy this Regulation. See sections 3.6 and 3.8 of this certificate. The product does not absorb water by capillary action and may therefore be used in situations where it bridges the dpc of the inner and outer leaf. See sections 6.2 and 6.3 of this Certificate.
Regulation: C5	Condensation
Comment:	Walls incorporating the product can meet this regulation. See sections 7.1 and 7.3 of this Certificate.
Regulation: E4(1)	Internal fire spread – Structure
Comment:	The product may be used in buildings of purpose group 1 where compliance with paragraph 3.27 of Technical Booklet E is achieved. See sections 8.2 to 8.4 of this Certificate.

Regulation:	F2(a)(i)	Building fabric
Regulation:	F3(2)	Target carbon dioxide Emission Rate
Comment:	The product can satisfy or contribute to satisfying this Regulation. See sections 5.2 to 5.3 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.

Non-regulatory Information

NHBC Standards 2010

NHBC accepts the use of Warmfill Cavity Wall Insulation for Masonry Cavity Walls, when installed and used in accordance with this Certificate, in relation to *NHBC Standards*, Chapter 6.1, *External masonry walls*.

General

It is essential that new and existing walls comply with the conditions set out in the design data and installation parts of the certificate. Installation must be carried out under the BBA Surveillance

Scheme for cavity wall installation by installers trained by the Certificate holder and approved jointly by the Certificate holder and the BBA.

Technical Specification

1 Description

1.1 Warmfill Cavity Wall Insulation for Masonry Walls is either white or silver polystyrene bead material for use as an insulation within the cavity of masonry brick and block cavity walls. An air drying adhesive is used as a bonding agent to provide long term stability to the insulant.

1.2 The target mean density for the product when installed with the bonding agent is $12 \text{ kg}\cdot\text{m}^{-3}$ and local areas within the wall when sampled over an area of 0.5 m^2 may have density variations of $\pm 2 \text{ kg}\cdot\text{m}^{-3}$.

2 Delivery and site handling

2.1 The product is delivered to site in polythene sacks or bulk containers marked with the BBA identification mark incorporating the number of this Certificate. The material has an indefinite storage life and should be kept dry.

2.2 Quotations, tenders and invoices may incorporate the number of this Certificate.

2.3 The bonding agent is delivered to site in containers marked with the BBA identification mark incorporating the number of this Certificate and must not be allowed to freeze.

Assessment and Technical Investigations

The following is a summary of the assessment and technical investigations carried out on Warmfill Cavity Wall Insulation for Masonry Walls.

Design Considerations

3 Use

3.1 Warmfill Cavity Wall Insulation for Masonry Cavity Walls is effective in reducing the thermal transmittance (U value) of external cavity walls, with masonry inner and outer leaves (masonry includes clay and calcium silicate bricks, concrete blocks, natural and reconstituted stone blocks). It is essential that such walls are designed and constructed so as to incorporate the normal precautions to prevent moisture penetration (see section 3.10).

3.2 This Certificate covers the use of the product in any exposure zone, subject to the following conditions being met.

3.3 The following design conditions have been taken from the BBA joint publication *Cavity Insulation of Masonry Walls — Dampness Risks and How to Minimise Them*. They are particularly important in areas subject to severe or very severe driving rain:

- the cavity width to be filled must be a nominal minimum of 50 mm
- walls must be in a good state of repair and must show no evidence of frost damage
- mortar joints must not show evidence of more than hairline cracking. Raked or recessed mortar joints should be avoided in high exposure areas.

Partial filling

3.4 Partial filling of the gable apex (ie limiting the fill to several brickwork courses above ceiling level) is permitted provided the top of the wall is protected by the roof and:

- the roof void is not an occupied space
- where the loft insulation is at ceiling level.

3.5 Other situations where partial filling is allowed are:

- when separately insulating semi-detached or terraced properties; the type of cavity barriers used for this purpose must be as defined in section 14.2
- up to the underside of a horizontal boundary, other than the roof, where that horizontal boundary is protected by a cavity tray or similar waterproof barrier
- where filling is carried out above a horizontal boundary
- when treating properties where the wall to be insulated is below a waterproof cladding (eg tile hung) and this cladding either extends up to the roof or is protected at the top by other means (eg window sills).

Existing buildings



3.6 Existing buildings subject to the national Building Regulations and Standards should be suitable when assessed in accordance with the relevant clauses of BS 8208-1 : 1985.

3.7 The product may not be installed if there are signs of dampness on the inner face of the cavity wall (other than those caused solely by condensation).

New buildings



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

- BS 5628-3 : 2005. In particular, Clause 5.5 of the Code of practice *Exclusion of water*
- BS 8000-3 : 2001
- BS EN 1996-1-1 : 2005, BS EN 1996-1-2 : 2005, BS EN 1996-2 : 2006 and BS EN 1996-3 : 2006.

3.9 Where the product is to be installed, injection of the insulant material must be left until the cavity is sealed from the weather, i.e. the roof is in place and the window and door openings are sealed.

3.10 Other new buildings not subject to regulatory requirements should also be built in accordance with the Standards identified in section 3.8.

4 Practicability of installation

The product must be installed by operatives trained and approved by the Certificate holder.

The Certificate holder operates an Approved Installer Scheme⁽¹⁾ for these systems under which the installers are approved, registered and regularly reviewed by the Certificate holder to demonstrate that they are competent to carry out installations of the systems in accordance with this Certificate. Details of Approved Installers are available from the Certificate holder. Approved Installers are responsible for each installation of the product that they undertake.

(1) The Certificate holder's records relating to their Approved Installer Scheme will be audited annually by the BBA as part of its programme of surveillance.

5 Thermal performance

5.1 Calculations of the thermal transmittance (U value) of specific external wall constructions should be carried out in accordance with BS EN ISO 6946 : 1997 and BRE Report (BR 443 : 2006) *Conventions for U-value calculations*. The thermal conductivity may be taken (estimated $\lambda_{90/90}$ value) as $0.045 \text{ W}\cdot\text{m}^{-1}\cdot\text{K}^{-1}$, $0.038 \text{ W}\cdot\text{m}^{-1}\cdot\text{K}^{-1}$ for Warmfill Silver and $0.036 \text{ W}\cdot\text{m}^{-1}\cdot\text{K}^{-1}$ for Warmfill Super Silver. The U value of a typical brick and block cavity wall construction will depend on the cavity width and the insulating value of the internal block leaf and finish. Example U values are given in Table 1.

Note: An estimated figure has been provided in the absence of an actual figure based upon the mean figure plus a correction factor of $0.005 \text{ W}\cdot\text{m}^{-1}\cdot\text{K}^{-1}$.

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

Cavity width	13 mm dense plaster, 100 mm dense block ⁽²⁾			Plasterboard on dabs, 100 mm AAC block ⁽³⁾		
	Warmfill White	Warmfill Silver	Warmfill Super Silver	Warmfill White	Warmfill Silver	Warmfill Super Silver
75	0.48	0.42	0.40	0.36	0.32	0.31
100	0.38	0.33	0.32	0.30	0.26	0.25
125	0.31	0.27	0.27	0.25	0.23	0.22

(1) Assumes fixings correction $\Delta U_f < 3\%$ of nominal U value and 102 mm thick brick outer leaf.

(2) Block and plaster thermal conductivity $1.13 W \cdot m^{-1} \cdot K^{-1}$ and $0.57 W \cdot m^{-1} \cdot K^{-1}$ respectively.

(3) Block and mortar thermal conductivity $0.12 W \cdot m^{-1} \cdot K^{-1}$ and $0.88 W \cdot m^{-1} \cdot K^{-1}$ respectively.



5.2 When considering insulation requirements, designers should refer to the detailed guidance contained in the documents supporting the national Building Regulations. The U values shown in Tables 2 to 4 indicate that the product can enable or contribute to enable, a wall to achieve typical design U values referred to in those supporting documents.

Table 2 Mean design wall U values — England and Wales⁽¹⁾

Construction	U value ($W \cdot m^{-2} \cdot K^{-1}$)
Notional non-domestic building	0.26
Existing building — new and replaced wall	0.28
Dwelling new-build limit	0.30
Existing building — renovated or retained walls	0.30
Notional dwelling	0.35
Non-domestic new-build limit	0.35

(1) Flexible approaches on existing buildings are given in the Approved Documents.

Table 3 Mean design wall U values — Scotland⁽¹⁾

Construction	U value ($W \cdot m^{-2} \cdot K^{-1}$)
Notional dwelling	0.19
New dwelling simplified method	0.19
Conversion unheated building (into dwellings)	0.19
Extension to dwelling	0.19
Alterations and reconstructions to a dwelling	0.22
Stand-alone building $< 50 m^2$ to a dwelling	0.22
New non-dwellings limit for shell and fit out	0.23
New dwelling limit	0.25
Conversion of unheated building	0.25
Non-domestic extension, alteration and reconstructions	0.25
New non-domestic limit	0.27
Conversion of heated building	0.30
Notional non-dwelling	0.30

(1) Flexible approaches on existing buildings are given in the Technical Handbooks.

Table 4 Mean design wall U values — Northern Ireland⁽¹⁾

Construction	U value ($W \cdot m^{-2} \cdot K^{-1}$)
Existing building — new wall	0.30
Notional dwelling	0.35
Notional non-domestic building	0.35
Building new-build limit	0.35
Existing building — replaced, renovated and retained wall	0.35

(1) Flexible approaches on existing buildings are given in the Technical Booklets.

5.3 The product can maintain, or contribute to maintaining, continuity of thermal insulation at junctions between elements. For Accredited Construction Details the corresponding psi values in BRE Information Paper IP1/06 *Assessing the effects of thermal bridging at junctions and around openings*, Table 3 may be used in carbon emission calculations in Scotland and Northern Ireland. Detailed guidance for other junctions and on limiting heat loss by air infiltration can be found in:

England and Wales — Approved Documents to Part L and for new thermal elements to existing buildings, Accredited Construction Details (version 1.0). See also SAP 2009 Appendix K and the *iSBEM User Manual* for new-build.

Scotland — Accredited Construction Details (Scotland)

Northern Ireland — Accredited Construction Details (version 1.0).

6 Liquid water penetration

6.1 The product will not allow water to cross the wall construction via the insulation. Water which penetrates the outer leaf of the wall will drain down the cavity face of the outer leaf.



6.2 Tests by the BBA demonstrate that when the product is used in situations where they bridge the dpc in walls, dampness from the ground will not pass through to the inner leaf provided the wall is detailed in accordance with the requirements and provisions of the national Building Regulations:

England and Wales — Approved Document C2(a)

Scotland — Mandatory Standard 3.4, clause 3.4.1⁽¹⁾

(1) Technical Handbook (Domestic).

Northern Ireland — Technical Booklet C, Section 1.6.

6.3 Tests by the BBA confirm that constructions built in accordance with BS 5628-3 : 2005, will resist the transfer of precipitation to the inner leaf and satisfy the national Building Regulations:

England and Wales — Requirement C2(b)

Scotland — Mandatory Standard 3.10, clause 3.10.1⁽¹⁾

(1) Technical Handbook (Domestic).

Northern Ireland — Regulation C4.

7 Condensation risk

Surface condensation



7.1 Walls will limit the risk of surface condensation adequately when the thermal transmittance (U value) does not exceed $0.7 \text{ W}\cdot\text{m}^{-2}\cdot\text{K}^{-1}$ at any point, and the junctions with floors, roofs and openings are designed in accordance with *Limiting thermal bridging and air leakage : Robust construction details for dwellings and similar buildings* TSO 2002 or BRE Information Paper IP 1/06.



7.2 For buildings in Scotland, other constructions will also be acceptable where the thermal transmittance (U value) of the wall does not exceed $1.2 \text{ W}\cdot\text{m}^{-2}\cdot\text{K}^{-1}$ at any point and openings and junctions with other elements comply with the guidance given in Section 8 of BS 5250 : 2002, BRE report (BR 262 : 2002) *Thermal insulation: avoiding risks* or Technical Booklet, Annex 6D, of the Scottish Building Regulations.

Interstitial condensation



7.3 Walls will limit the risk of interstitial condensation adequately when they are designed and constructed in accordance with BS 5250 : 2002 (Section 8 and Annex D).

8 Behaviour in relation to fire

8.1 The use of the product does not prejudice the fire-resistance properties of the wall. It is unlikely to become ignited within the cavity when used in the context of this Certificate. If fire does penetrate into the cavity, the amount of air present will be insufficient to support combustion. However, the instructions contained in this Certificate relating to the sealing of an uncapped cavity (see section 13.3) and removing insulant present in the loft space (see section 17.4) must be carefully followed.



8.2 The requirements of the 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, Diagram 13

Northern Ireland — Technical Booklet E, Diagram 3.5.

8.3 A summary of these provisions is given here:

England and Wales and Northern Ireland

- the wall must consist of masonry inner and outer leaves, each at least 75 mm thick

- the cavity must not be more than 300 mm (Northern Ireland only)
- the cavity must be closed at the top of the wall and at the top of any opening
- in addition to the insulation only the following combustible materials shall be placed in, or exposed to, the cavity:
 - timber lintels, window or door frames, or end of timber joists
 - pipe, conduit or cable
 - dpc, flashing, cavity closer or wall tie
 - domestic meter cupboard, provided that 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.



8.4 For constructions not covered by sections 8.2 and 8.3 cavity barriers must be provided to comply with:

England and Wales — Approved Document B, Section 6

Scotland — Mandatory Standard 2.4, clauses 2.4.1⁽¹⁾ and 2.4.2⁽¹⁾

(1) Technical Handbook (Domestic).

Northern Ireland — Technical Booklet E, Paragraphs 3.35 to 3.38.



8.5 The product is combustible but it may be used in a wall on or less than one metre from a relevant boundary, where no storey is at a height of more than 18 m above ground.

9 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

Scotland — Mandatory Standard 3.19, clause 3.19.1⁽¹⁾

(1) Technical Handbook (Domestic).

Northern Ireland — Technical Booklet L.

10 Maintenance

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

10.2 Should it for any reason become necessary, the product can be evacuated from the cavity void.

11 Durability



The product is durable, rot-proof, water resistant and sufficiently stable to remain effective as an insulation for the life of the building.

Installation

12 Site assessment

An assessment is carried out prior to installation of Warmfill Cavity Wall Insulation for Masonry Cavity Walls by a trained assessor (who may also be the installing technician), to ascertain the suitability of the property or properties. An assessment report is prepared and held at the installer's offices. Particular problems are specifically identified and any reasons for rejection noted. Care should be taken at this stage by the assessor and the party commissioning the work, to identify and agree in writing as appropriate, any areas of the wall that will not be filled (see section 17.6) and any special requirements for making good (see section 17.5).

13 Site preparation

13.1 The installing technician ensures that the property has been correctly assessed and is suitable for insulation. Any problems encountered during drilling which prevent compliance with this Certificate are referred to the installation company before proceeding.

13.2 Essential ventilation openings, such as those providing combustion air or underfloor ventilation, and all flues in the cavity wall are checked. If adequate sleeving or other cavity closures are not present, installation must not proceed until these openings have been sleeved or otherwise modified to prevent blockage by the insulant.

13.3 All uncapped cavity walls should be sealed prior to installation.

14 Approved installers

Installation of the product is carried out by the Certificate holder, or an approved installer, being a company which:

- is required to satisfy an initial site installation check by the BBA prior to approval by the Certificate holder and is subject to the BBA Surveillance Scheme
- is approved by the Certificate holder and the BBA to install the product
- has undertaken to comply with the Certificate holder's installation procedure
- is employing technicians who have been issued with appropriate identity cards by the Certificate holder; at least one member of each installation team must carry a card
- is subject to supervision by the Certificate holder, including unannounced site inspections
- the system supplier oversees the activities of a selection of approved installers operating under the BBA Surveillance Scheme for Cavity Wall Insulation. It is a requirement that the system supplier undertakes a minimum of four inspections per annum to each installer using their product and maintains records.

15 Supervision

15.1 Installation should be carried out in accordance with this Certificate, the supplier's manual and the BBA Surveillance Scheme.

15.2 During installation, as an aid to determining that the installation conforms to the certificated method, checks can be made to ensure that:

- pattern of holes complies with the description given in section 17 and Figure 1 (see section 17.1)
- injection of the material takes place at each hole to complete the filling of the cavity space.

16 General

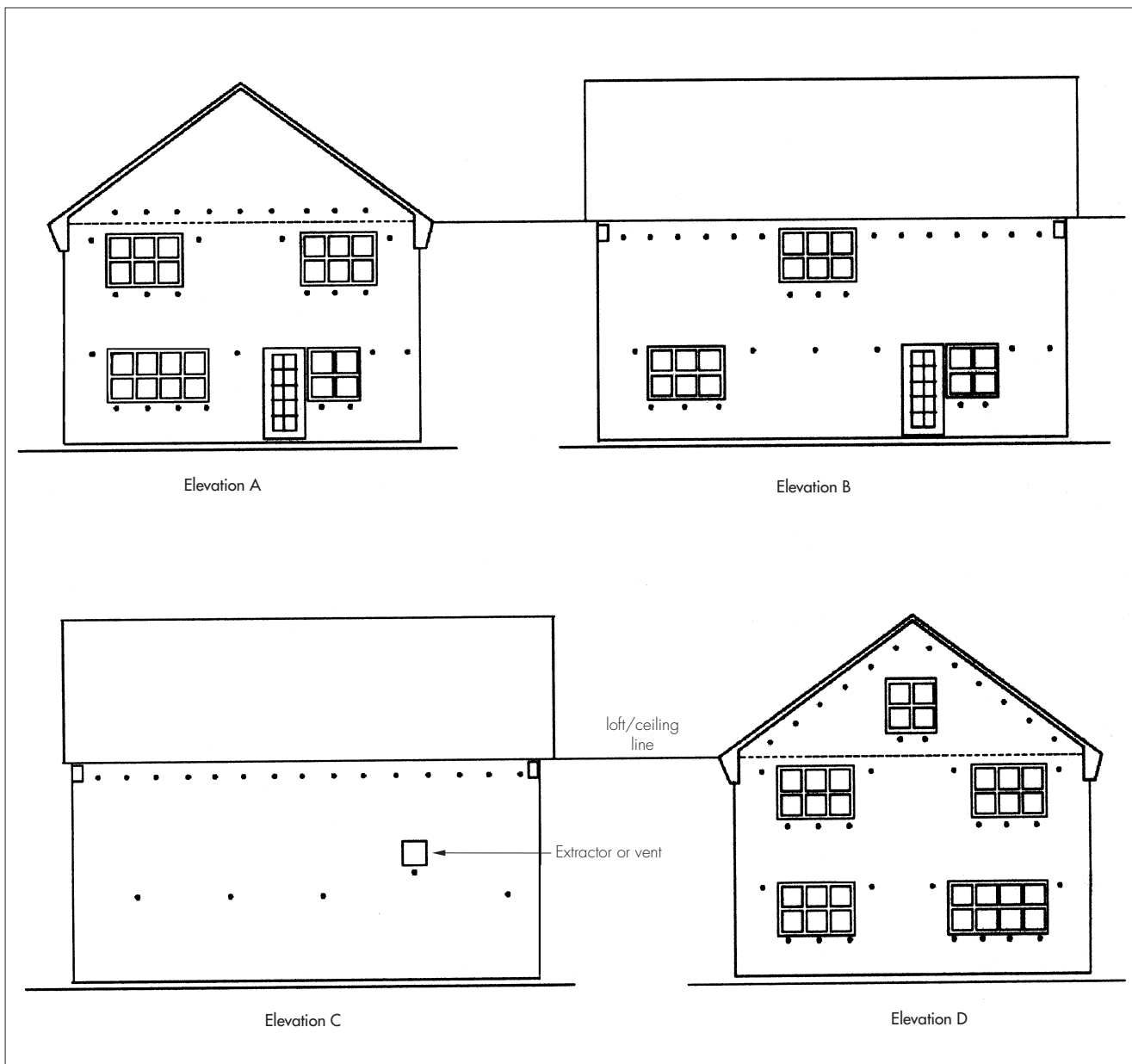
16.1 The product is installed using an approved system either based on compressed air delivery or electric fan delivery system, marked with the appropriate BBA Certificate number. The installation company provides all necessary hoses, drilling tools, equipment and materials for making good the walls after the installation.

16.2 Where a semi-detached or terraced property is to be treated, the insulant is contained by inserting a cavity barrier at the line dividing the properties. This consists of a continuous cavity brush which is left in place when the installation is completed.

17 Procedure

17.1 Holes of 22 mm or 26 mm diameter are drilled between bricks at the junction of the horizontal and vertical mortar joints. Sufficient injection holes must be drilled to ensure that the cavity will be completely filled without voids. The holes are normally spaced not more than 600 mm horizontally apart and the top row of holes in each wall is not more than 200 mm from the top of the wall. A similar series of holes is drilled below windows and obstructions and, if found to be necessary, along the lines of the roof slope at gable ends. Alternatively, a series of holes is drilled approximately 600 mm horizontally apart and 200 mm above the highest ceiling level. A further series of holes (2.0 m apart) is drilled at the middle height of a two-storey building to ensure complete fill of the cavity space. Care should be taken that these holes do not coincide with the intermediate suspended timber floor. A typical drilling pattern is shown in Figure 1.

Figure 1 Drilling pattern



17.2 Additional holes should be drilled between windows, doors and other obstacles where necessary. It is important to ensure chimneys and flues are not obstructed by the installation of the product, the correct functioning of these should be checked once the installation is complete.

17.3 To prevent debris falling onto the insulation installation should not start until the drilling has been completed on each elevation.

17.4 Installation should be conducted in accordance with the drilling pattern shown in Figure 1 and should take place from the lowest injection holes up, with the product installed into the upper holes only after all of the lower holes have been filled. Care should be taken to ensure any holes drilled in the upper floor do not correspond with intermediate timber floors or that the insulation does not fill into the roof space. Any insulant that has been blown through the top of the cavity into the loft space should be removed and any points of leakage sealed.

17.5 After injection of the product, the drill holes are fully filled with a mortar mix of a similar colour, texture and weathertightness as the existing mortar. Where a wall requires a high degree of colour matching, the level of finish matching should be agreed in writing during the survey. All the trunked air vents are checked, eg, those providing underfloor ventilation and combustion air for heating appliances. In all cases flues are carefully checked on completion of the installation by means of an appropriate test (eg, a smoke test) to ensure that they are not obstructed by the insulant.

17.6 In some circumstances access for drilling injection holes and filling with insulation may be limited by features for example carports, conservatories, cladding or tiling. The practicability of safely accessing and making good these areas, or installing the insulation through the inner leaf, may outweigh the benefits of insulating these areas. In such situations, the surveyor should explain that heat loss through uninsulated areas will not be reduced and they will also be subject to a slightly higher risk of condensation. The assessor, therefore, should obtain written consent for omitting any areas of the wall from the party commissioning the work.

18 Tests

Tests were carried out on Warmfill Cavity Wall Insulation for Masonry Cavity Walls to determine:

- the water resistance of a cavity wall filled with the insulant
- adequacy of fill using specified installation equipment and drilling pattern
- material characterisation tests.

19 Investigations

19.1 Existing data on thermal properties, toxicity durability and properties in relation to fire were evaluated.

19.2 The Certificate holder's training arrangements were evaluated.

19.3 An assessment of the practicality of installation was carried out.

Bibliography

BS 5250 : 2002 *Code of practice for control of condensation in buildings*

BS 5628-3 : 2005 *Code of practice for the use of masonry — Materials and components, design and workmanship*

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

BS 8208-1 : 1985 *Guide to assessment of suitability of external cavity walls for filling with thermal insulants — Existing traditional cavity construction*

BS EN ISO 6946 : 1997 *Building components and building elements — Thermal resistance and thermal transmittance — Calculation method*

20 Conditions

20.1 This Certificate:

- relates only to the product/system that is named and described on the front page
- is granted only to the company, firm or person named on the front page — no other company, firm or person may hold or claim any entitlement to this Certificate
- is valid only within the UK
- has to be read, considered and used as a whole document — it may be misleading and will be incomplete to be selective
- is copyright of the BBA
- is subject to English law.

20.2 Publications and documents referred to in this Certificate are those that the BBA deems to be relevant at the date of issue or re-issue of this Certificate and include any: Act of Parliament; Statutory Instrument; Directive; Regulation; British, European or International Standard; Code of Practice; manufacturers' instructions; or any other publication or document similar or related to the aforementioned.

20.3 This Certificate will remain valid for an unlimited period provided that the product/system and the manufacture and/or fabrication including all related and relevant 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.

20.4 In granting this Certificate, the BBA is not responsible for:

- the presence or absence of any patent, intellectual property or similar rights subsisting in the product/system or any other product/system
- the right of the Certificate holder to manufacture, supply, install, maintain or market the product/system
- individual installations of the product/system, including the nature, design, methods and workmanship of or related to the installation
- the actual works in which the product/system is installed, used and maintained, including the nature, design, methods and workmanship of such works.

20.5 Any information relating to the manufacture, supply, installation, use and maintenance 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 and maintained. It does not purport in any way to restate the requirements of the Health & Safety at Work etc Act 1974, or of any other statutory, common law or other duty which may exist at the date 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. 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 manufacture, supply, installation, use and maintenance of this product/system.

