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BBA APPROVAL INSPECTION TESTING CERTIFICATION
TECHNICAL APPROVALS FOR CONSTRUCTION

Agrément Certificate
96/3228
Product Sheet 1

POLYPEARL CAVITY WALL INSULATION

POLYPEARL PLUS AND POLYPEARL PLATINUM CAVITY WALL INSULATION

This Agrément Certificate Product Sheet(1) relates to Polypearl Plus and Polypearl Platinum Cavity Wall Insulation, expanded polystyrene material injected in bead form with or without a bonding agent, for use in external masonry walls up to and including 12 m in height, with nominal cavity widths not less than 50 mm (Polypearl Plus) and 40 mm (Polypearl Platinum), in new and existing domestic and non-domestic buildings. The products may also be used in buildings over 12 m in height where a height restriction waiver has been issued by the Certificate holder.

(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 properties — the products have an estimated thermal conductivity ($\lambda_{estimated}$) of 0.042 $W \cdot m^{-1} \cdot K^{-1}$ for Polypearl Plus and a declared thermal conductivity ($\lambda_{90/90}$) of 0.035 $W \cdot m^{-1} \cdot K^{-1}$ for Polypearl Platinum (see section 6).

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

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

Behaviour in relation to fire — use of the products does not prejudice the fire resistance properties of the wall (see section 9).

Durability — the products are durable, rot-proof, water resistant and sufficiently stable to remain effective as an insulation for the life of the building (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: 2 May 2013

Originally certificated on 27 February 1996

John Albon — Head of Approvals
Energy and Ventilation

Greg Cooper
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, Polypearl Plus and Polypearl Platinum Cavity Wall Insulation, if installed, used and maintained in accordance with this Certificate, will meet or contribute to meeting 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:	C2(a)	**Resistance to moisture**
Comment:		The products can contribute to meeting this Requirement. See section 7.1 of this Certificate.
Requirement:	C2(b)	**Resistance to moisture**
Comment:		The products can contribute to meeting this Requirement. See sections 4.7, 7.1 and 7.2 of this Certificate.
Requirement:	C2(c)	**Resistance to moisture**
Comment:		The products can to 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 meeting this Requirement. See section 6 of this Certificate.
Regulation:	7	**Materials and workmanship**
Comment:		The products are an acceptable material. See section 12.1 and the *Installation* part of this Certificate.
Regulation:	26	**CO_2 emission rates for new buildings**
Comment:		The products can contribute to meeting this Regulation. See section 6 of this Certificate.

The Building (Scotland) Regulations 2004 (as amended)

Regulation:	8(1)	**Fitness and durability of materials and workmanship**
Comment:		The products can contribute to a construction satisfying this Regulation. See section 12.1 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 domestic and non-domestic buildings in accordance with the exceptions permitted in the Standard, with reference to clauses 2.6.5[1] and 2.6.6[2]. See section 9.5 of this Certificate.
Standard:	3.4	Moisture from the ground
Comment:		The products can contribute to a construction satisfying this Standard, with reference to clause 3.4.1[1][2]. See section 7.1 of this Certificate.
Standard:	3.10	Precipitation
Comment:		The products will resist water transfer and may contribute to a wall satisfying this Standard, with reference to clause 3.10.1[1] provided it complies with the conditions set out in sections 4.7, 7.1 and 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:		This products can contribute to satisfying these clauses, or parts of 6.1.1[1], 6.1.2[2], 6.1.6[1], 6.2.1[1][2], 6.2.3[1], 6.2.4[2], 6.2.5[2], 6.2.6[1], 6.2.7[1], 6.2.8[1][2], 6.2.9[1][2], 6.2.10[1][2], 6.2.11[1][2], 6.2.12[2] and 6.2.13[1][2] of these Standards. See section 6 of this Certificate.
Standard:	7.1(a)(b)	Statement of sustainability
Comment:		The products can contribute to meeting 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 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 an acceptable material. See section 12.1 and the *Installation* part of this Certificate.
Regulation:	28(a)	**Resistance to moisture and weather**
Comment:		The products can contribute to a construction satisfying this Regulation. See section 7.1 of this Certificate.
Regulation:	28(b)	**Resistance to moisture and weather**
Comment:		The products can contribute satisfying this Regulation. See sections 4.7, 7.1 and 7.2 of this Certificate.

Regulation:	29	Condensation
Comment:		The products will contribute to meeting this Regulation. See section 8.3 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 section 6 of this Certificate.

Construction (Design and Management) Regulations 2007

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

Information in this Certificate may assist the client, CDM co-ordinator, designer and contractors to address their obligations under these Regulations.

See section: 3 *Delivery and site handling* (3.1) of this Certificate.

Additional Information

NHBC Standards 2013

NHBC accepts the use of Polypearl Plus and Polypearl Platinum Cavity Wall Insulation, other than in very severe exposure locations with fair-faced masonry; provided it is installed and used in accordance with this Certificate, in relation to *NHBC Standards*, Chapter 6.1, *External masonry walls*.

Technical Specification

1 Description

1.1 Polypearl Plus and Polypearl Platinum Cavity Wall Insulation are expanded polystyrene bead materials (white and grey respectively), for use as an injected insulation with or without a bonding agent within the cavity of masonry cavity walls. The bonding agent is used to adhere the beads together and provide long-term stability to the insulation.

1.2 The target mean density of these products when installed is 15 $kg \cdot m^{-3}$ over the entire installation. Individual areas within the wall must not have an absolute density variation of more than ±2 $kg \cdot m^{-3}$ from the target mean density when measured over an area of 0.5 m^2.

2 Manufacture

2.1 The raw material is fed into an expander and heated by steam, which causes expansion of the bead to a controlled density.

2.2 As part of the assessment and ongoing surveillance of products quality, the BBA has:

- agreed with the manufacturer the quality control procedures and products 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.

3 Delivery and site handling

3.1 The products are delivered to site in polythene sacks or bulk containers and may be marked with the BBA identification mark incorporating the number of this Certificate. The material, which has an indefinite storage life, should be kept dry and away from heat sources.

3.2 The bonding agent is water based and is delivered to site in containers marked with the BBA identification mark incorporating the number of this Certificate.

3.3 The bonding agent must be protected from frost, high temperatures and direct sunlight. Containers should be stored inside and off the ground at a temperature between 2°C and 30°C. It must not be use beyond its use-by date or allowed to freeze at any time.

Assessment and Technical Investigations

The following is a summary of the assessment and technical investigations carried out on Polypearl Plus and Polypearl Platinum Cavity Wall Insulation.

Design Considerations

4 General

4.1 Polypearl Plus and Polypearl Platinum Cavity Wall Insulation is satisfactory for use as an injected cavity wall insulation and is effective in reducing the thermal transmittance (U value) of external cavity walls, with masonry inner and outer leaves (where masonry includes clay and calcium silicate bricks, concrete blocks, natural and reconstituted stone blocks). The products are for use in new and existing domestic and non-domestic buildings up to and including 12 m in height, with cavity widths not less than 50 mm for Polypearl Plus and 40 mm for Polypearl Platinum. It is essential that such walls are designed and constructed to incorporate the precautions given in this Certificate to prevent moisture penetration.

4.2 This Certificate covers the use of the products in any exposure zone, subject to the following conditions being met. They are particularly important in areas subject to severe or very severe driving rain:

- a site survey should be carried out prior to installation (see sections 13 and 14)
- the minimum cavity width must be not less than 50 mm for Polypearl Plus and 40 mm for Polypearl Platinum
- walls must be in good state of repair and 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 very severe exposure areas.

4.3 The NHBC does not accept the use of full fill insulation in very severe exposure locations with fair-faced masonry.

Partial filling — omitted areas

4.4 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
- the loft insulation is at ceiling level.

4.5 Partial filling is also allowed:

- separately insulating semi-detached or terraced properties. The cavity barrier used for this purpose is retained in the cavity and must be as defined in section 17.3
- filling 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
- 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)
- treating areas of wall where access for drilling may be limited by features such as carports and conservatories as defined in sections 18.5 and 18.6.

Existing buildings

4.6 In an existing building, the products may be installed only:

- where there are no signs of dampness on the inner face of the cavity wall, other than those caused solely by condensation, and
- where the cavity is not being used as a source of combustion air or as a flue for ventilation purposes.

New buildings

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

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

4.8 Other new buildings not subject to regulatory requirements should also be built in accordance with the Standards identified in section 4.7.

4.9 In a new building where the products are to be installed:

- cavity battens or boards must be used to reduce the amount of mortar droppings left in the cavity
- injection of the products should be left until the cavity is sealed from the weather, ie the roof is in place and the window and door openings sealed.

5 Practicability of installation

The products must be installed by operatives trained and approved by the Certificate holder and subsequently approved by the BBA. The Certificate holder operates an Approved Installer Scheme[1] for these products 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 products in accordance with this Certificate. Details of Approved Installers are available from the Certificate holder. Approved Installers are responsible for each installation of the products that they undertake (see section 15).

(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.

6 Thermal properties

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 insulation's declared thermal conductivity ($\lambda_{90/90}$) in Table 1.

Table 1 Thermal conductivities of the insulation

EPS bead	Thermal conductivity ($W \cdot m^{-1} \cdot K^{-1}$)
Polypearl Plus	0.042[1]
Polypearl Platinum	0.035

(1) 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 $W \cdot m^{-1} \cdot K^{-1}$.

6.2 Where an existing wall is subject to national Building Regulations, for example, subject to a material change of use, designers should take account of the relevant guidance relating to technical and economic feasibility and target U values in the documents supporting those Regulations.

6.3 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. Calculated U values for example constructions are given in Table 2 for existing buildings and Table 3 for new buildings.

Table 2 Example cavity wall U values — Existing/retained walls

Cavity width/ insulation thickness (mm)	U values ($W \cdot m^{-2} \cdot K^{-1}$)[1]			
	13 mm dense plaster		Plasterboard on dabs	
	100 mm dense block[2][3]		100 mm AAC block[4]	
	Polypearl Plus	Polypearl Platinum	Polypearl Plus	Polypearl Platinum
40	n/a	0.64	n/a	0.44
50	0.63	0.54	0.43	0.39
75	0.45	0.39	0.34	0.30
100	0.36	0.32	0.28	0.25
125	0.29	0.26	0.24	0.21

(1) Assumes 102 mm thick brick outer leaf, steel double-triangle ties (12.5 mm^2) at 2.5 m^2 and 6.7% mortar (0.88 $W \cdot m^{-1} \cdot K^{-1}$) bridging inner block leaf.

(2) Dense plaster 0.57 $W \cdot m^{-1} \cdot K^{-1}$.

(3) Dense block at 1.13 $W \cdot m^{-1} \cdot K^{-1}$.

(4) AAC block at 0.12 $W \cdot m^{-1} \cdot K^{-1}$.

Table 3 Example cavity wall U values[1] — New buildings

U value requirement ($W \cdot m^{-2} \cdot K^{-1}$)	Insulation thickness (mm)			
	13 mm dense plaster		Plasterboard on dabs	
	100 mm dense block[2][3]		100 mm AAC block[4]	
	Polypearl Plus	Polypearl Platinum	Polypearl Plus	Polypearl Platinum
0.19	200	175	170	140
0.25	150	130	120	100
0.26	145	125	115	95
0.27	140	120	105	90
0.30	125	105	90	75
0.35	105	90	75	60

(1) Assumes 102 mm thick brick outer leaf, steel double-triangle ties (12.5 mm^2) at 2.5 m^2 and 6.7% mortar (0.88 $W \cdot m^{-1} \cdot K^{-1}$) bridging inner block leaf.

(2) Dense plaster 0.57 $W \cdot m^{-1} \cdot K^{-1}$.

(3) Dense block at 1.13 $W \cdot m^{-1} \cdot K^{-1}$.

(4) AAC block at 0.12 $W \cdot m^{-1} \cdot K^{-1}$.

Junctions

6.4 The products can maintain, or contribute to maintaining, continuity of thermal insulation at junctions between elements and openings. For Accredited Construction Details, the corresponding psi values in BRE Information Paper IP 1/06, 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).

7 Water penetration

7.1 These products can be 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, clause 3.4.1[1][2]

(1) Technical Handbook (Domestic).

(2) Technical Handbook (Non-Domestic).

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

7.2 When the products are properly installed in accordance with this certificate, any rainwater penetrating the cavity will not reach the inner leaf.

8 Condensation

Surface condensation

8.1 Walls 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 Walls will limit the risk of surface condensation adequately when the thermal transmittance (U value) of the wall does not exceed 1.2 $W \cdot m^{-2} \cdot K^{-1}$ at any point. Guidance may be obtained from BS 5250 : 2011, Annex G and BRE Report (BR 262 : 2002) and section 6.4 of this Certificate.

Interstitial condensation

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

9 Behaviour in relation to fire

9.1 The use of the products 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 (section 14.3) and removing insulant present in the loft space after installation (section 18.4), must be carefully followed.

9.2 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, 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, but 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] and 2.4.2[1][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', but may be used in a wall on or less than 1 m from a relevant boundary, where they are installed in a cavity that is between two leaves of masonry or concrete 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.

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

Scotland — Mandatory Standard 3.19, clause 3.19.1[1]

(1) Technical Handbook (Domestic).

Northern Ireland — Technical Booklet L.

11 Maintenance

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

12 Durability

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

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

Installation

13 Site assessment

Prior to the installation, an assessment is carried out by a trained assessor, who may also be the installing technician, to ascertain the suitability of the property or properties to receive Polypearl Plus and Polypearl Platinum Cavity Wall Insulation. An assessment report is prepared and held at the installer's offices. Particular problems are specifically identified and any reasons for rejection of the work noted. Care should be taken at this stage for 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 18.5 and 18.6) and any special requirements for making good (see section 18.3).

14 Site preparation

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

14.2 Essential ventilation openings, such as those providing combustion air or underfloor ventilation, and all flues in the cavity wall must be 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.

14.3 Wherever practicably possible, all uncapped cavity walls must be sealed prior to installation, for example, with plugs of mineral fibre.

15 Approved installers

Installation of the products is carried out by the Certificate holder or their approved installers. An approved installer is defined as a company:

- required to satisfy an initial site installation check by the BBA following approval by the Certificate holder and is subject to the *BBA Assessment and Surveillance Scheme for Installation of Cavity Wall Insulation*
- approved by the Certificate holder and the BBA to install the products
- having undertaken to comply with the Certificate holder's installation procedure
- 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
- subject to inspections by the Certificate holder. The Certificate holder oversees the activities of approved installers operating under the BBA Surveillance Scheme for Cavity Wall Insulation. It is a requirement that the Certificate holder undertakes inspections to each card-carrying technician using their products and maintains records, as detailed in the *BBA Assessment and Surveillance Scheme for BBA Approved Installers of Cavity Wall Insulation*.

16 Supervision

16.1 Installation of the products should be carried out in accordance with the *BBA Assessment and Surveillance Scheme for Installation of Cavity Wall Insulation*.

16.2 During installation, the following simple checks can be made, as an aid to determining that the installation conforms to the certificated method:

- check that the pattern of holes complies with the description given in section 18.1
- injection of material takes place in each hole, to complete the filling of the cavity space.

17 General

17.1 The installation of the products is undertaken using injection equipment tested and accepted for use with the products by the BBA.

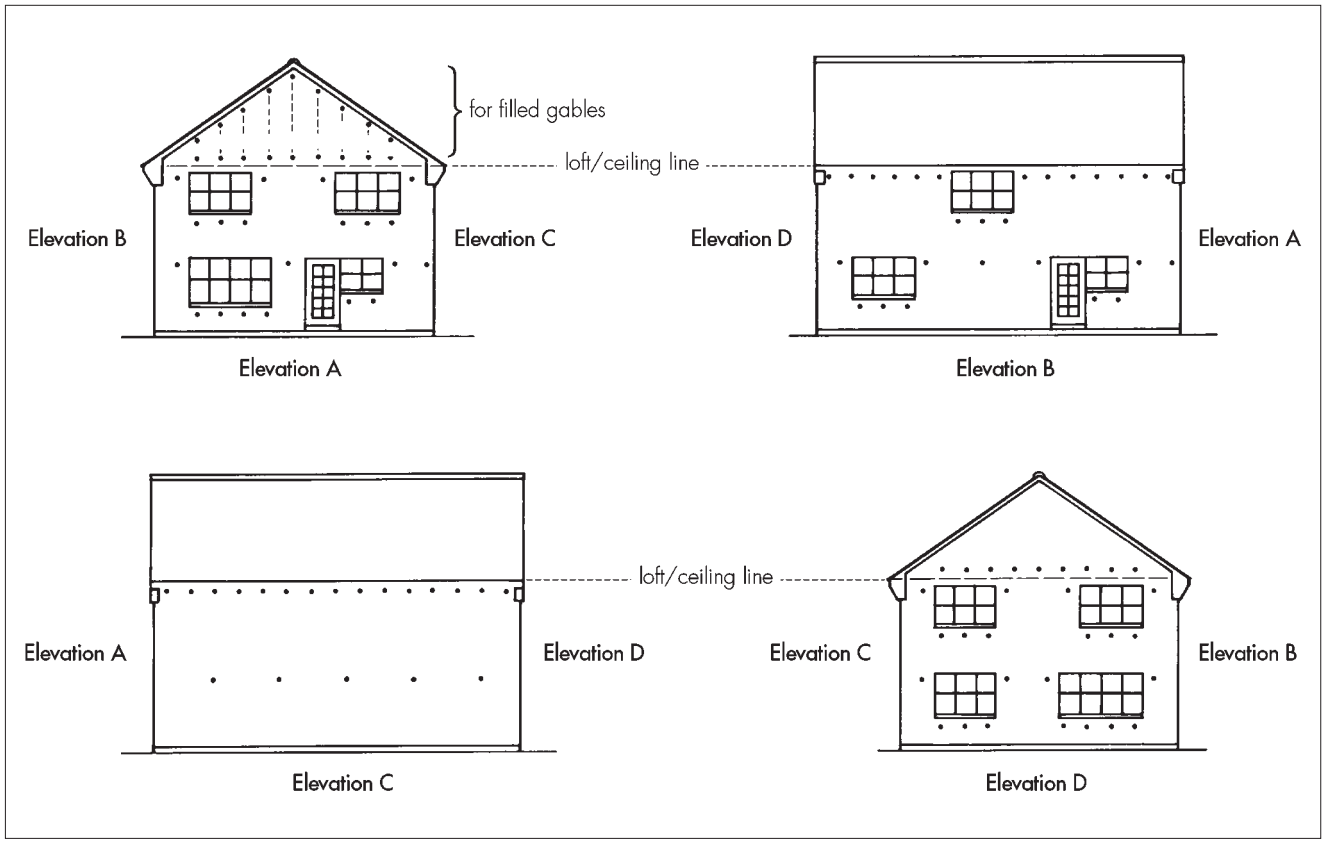
17.2 The installer provides all necessary hoses, drilling tools, equipment and materials for making good the walls after the installation.

17.3 Where a semi-detached or terraced property is to be insulated, a cavity brush is inserted at the line dividing the properties to contain the insulation. This consists of a continuous polypropylene brush which is left in place when the installation is completed.

18 Procedure

18.1 Holes of 18 mm or 22 mm diameter are drilled through the mortar joints of the outer leaf in existing buildings or the inner leaf of buildings under construction. A line of holes are placed in a horizontal row no further apart than 0.7 m and not more than 300 mm from the top of the wall or along a level 100 mm above the highest ceiling level. A similar series of holes is drilled below windows. If the roof space forms part of the habitable area the top horizontal row of holes is replaced with holes drilled along the lines of the roof slope at gable ends. On two-storey buildings an intermediate row of holes is drilled 2 m apart horizontally and just below the ground-floor ceiling level. To ensure complete fill of the cavity, supplementary holes should be drilled below any obstruction such as meter boxes, sleeved air bricks or boiler flues. A typical drilling pattern is shown in Figure 1.

Figure 1 Typical drilling pattern



18.2 The products are injected into the cavity (if applicable, at the correct material bonding agent ratio) through flexible pipes connected to a uniquely designed injection gun incorporating a non-directional nozzle. The material packs to a uniform density in the cavity and this is not affected by the injection equipment. Holes beneath ground-floor windows are injected first and filling then continues upwards until a complete fill has been achieved.

18.3 After injection, the drill holes are fully filled with mortar of a similar type, colour, texture and weathertightness as that of the existing wall. Where a wall requires a high degree of colour matching, the level of finish matching should be agreed in writing during the site assessment. All trunked air vents eg those providing underfloor ventilation and combustion air for heating appliances are checked – any obstructions must be cleared. All flues must be carefully checked by an appropriate test (eg a smoke test) to verify that they are clear and unobstructed.

18.4 Insulant blown through the top of the cavity into the loft space is removed and any points of leakage sealed (see section 14.3).

Omitted areas

18.5 In some circumstances access for drilling injection holes and filling with insulation may be limited by features such as 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.

18.6 It is permissible to omit such areas only when:

- a full justification detailing the reasons to omit areas is included in the survey report
- the assessor obtains written consent for omitting any areas of the wall from the party commissioning the work. The assessor must verify that heat loss through uninsulated areas will not be reduced and that they will also be subject to a slightly higher risk of condensation.

19 Height restriction waivers

19.1 Polypearl Plus and Polypearl Platinum Cavity Wall Insulation is for use in buildings up to and including 12 m in height, in domestic and non-domestic buildings. The products may also be used in buildings over 12 m in height where a height restriction waiver has been issued by the Certificate holder.

19.2 The Certificate holder has a detailed programme for the assessment of buildings over 12 m, as approved and maintained under surveillance by the BBA. Each installation beyond 12 m must be individually assessed by the Certificate holder against this agreed assessment programme and documented approval given prior to the commencement of work.

Technical Investigations

20 Tests

- resistance to rain penetration of an insulated cavity wall
- adequacy of fill using specified installation machinery and drilling pattern
- thermal conductivity to BS EN 12667 : 2001
- characterisation of the products.

21 Investigations

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

21.2 The Certificate holder's training arrangements were evaluated.

21.3 An assessment of the practicability of installation was carried out.

22 Other investigations

The manufacturing process of the expanded polystyrene bead material was examined, including the methods adopted for quality control, and details were obtained of the quality and composition of the materials used.

Bibliography

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

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

BS EN 1996-1-1 : 2005 *Eurocode 6 — Design of masonry structures — General rules for reinforced and unreinforced masonry structures*
NA to BS EN 1996-1-1 : 2005 *UK National Annex to Eurocode 6 — Design of masonry structures — General rules for reinforced and unreinforced masonry structures*
BS EN 1996-1-2 : 2005 *Eurocode 6 — Design of masonry structures — General rules — Structural fire design*
NA to BS EN 1996-1-2 : 2005 *UK National Annex to Eurocode 6 — Design of masonry structures — General rules — Structural fire design*
BS EN 1996-2 : 2006 *Eurocode 6 — Design of masonry structures — Design considerations, selection of materials and execution of masonry*
NA to BS EN 1996-2 : 2006 *UK National Annex to Eurocode 6 — Design of masonry structures — Design considerations, selection of materials and execution of masonry*
BS EN 1996-3 : 2006 *Eurocode 6 — Design of masonry structures — Simplified calculation methods for unreinforced masonry structures*
NA to BS EN 1996-3 : 2006 *UK National Annex to Eurocode 6 — Design of masonry structures — Simplified calculation methods for unreinforced masonry structures*

BS EN 12667 : 2001 *Thermal performance of building materials and products — Determination of thermal resistance by means of guarded hot plate and heat flow meter methods — Products of high and medium thermal resistance*

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

BRE Information Paper IP 1/06 *Assessing the effects of thermal bridging at junctions and around openings*

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

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

23 Conditions

23.1 This Certificate:

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

23.2 Publications, documents, specifications, legislation, regulations, standards and the like referenced in this Certificate are those that were current and/or deemed relevant by the BBA at the date of issue or reissue of this Certificate.

23.3 This Certificate will remain valid for an unlimited period provided that the product/system and its manufacture and/or fabrication, including all related and relevant parts and processes thereof:

- are maintained at or above the levels which have been assessed and found to be satisfactory by the BBA
- continue to be checked as and when deemed appropriate by the BBA under arrangements that it will determine
- are reviewed by the BBA as and when it considers appropriate.

23.4 The BBA has used due skill, care and diligence in preparing this Certificate, but no warranty is provided.

23.5 In issuing this Certificate, the BBA is not responsible and is excluded from any liability to any company, firm, organisation or person, for any matters arising directly or indirectly from:

- 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
- actual installations of the product/system, including their nature, design, methods, performance, workmanship and maintenance
- any works and constructions in which the product/system is installed, including their nature, design, methods, performance, workmanship and maintenance
- any loss or damage, including personal injury, howsoever caused by the product/system, including its manufacture, supply, installation, use, maintenance and removal
- any claims by the manufacturer relating to CE marking.

23.6 Any information relating to the manufacture, supply, installation, use, maintenance and removal of this product/system which is contained or referred to in this Certificate is the minimum required to be met when the product/system is manufactured, supplied, installed, used, maintained and removed. It does not purport in any way to restate the requirements of the Health and Safety at Work etc. Act 1974, or of any other statutory, common law or other duty which may exist at the date of issue or reissue of this Certificate; nor is conformity with such information to be taken as satisfying the requirements of the 1974 Act or of any statutory, common law or other duty of care.

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