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BBA BRITISH BOARD OF AGRÉMENT
TECHNICAL APPROVALS FOR CONSTRUCTION

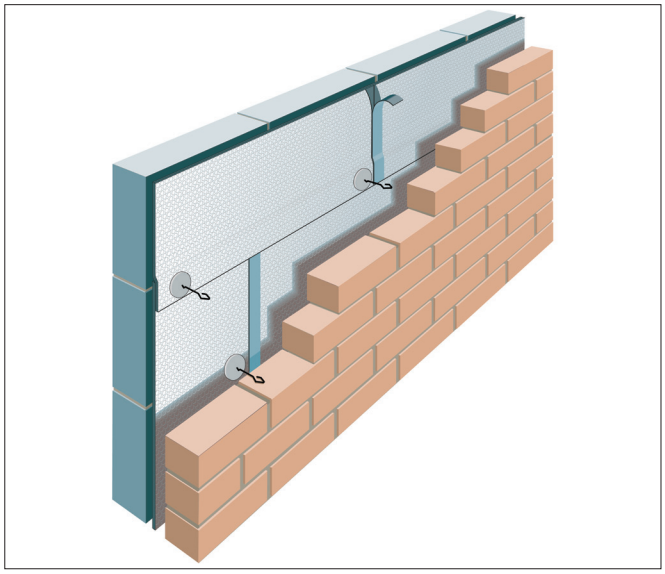
Agrément Certificate
No 08/4565

ALUMINIUM FOIL BUBBLE INSULATION

PRODUCT SHEET 1 — AIRTEC SINGLE AND AIRTEC DOUBLE CAVITY WALL INSULATION

PRODUCT SCOPE AND SUMMARY OF CERTIFICATE

This Certificate relates to Airtec Single and Airtec Double Cavity Wall Insulation, a foil-faced bubble sheet for use in cavity walls.



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

Thermal performance — the product can be used to improve the thermal performance of wall construction (see section 5).

Condensation risk — performance of the product with regard to interstitial and surface condensation has been considered (see section 6).

Liquid water penetration — when the product is used in situations where it bridges the dpc in walls, dampness from the ground will not pass through to the inner leaf (see section 7).

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

Durability — the design life of the product under typical UK conditions has been considered and the product will remain effective as an insulant for the life of the building (see section 10).

The BBA has awarded this Agrément Certificate for the Airtec Single and Airtec Double Cavity Wall Insulation to YBS Insulation Ltd as fit for its intended use provided it is installed, used and maintained as set out in this Agrément Certificate.

On behalf of the British Board of Agrément

Date of First issue: 9 June 2008

Chris Hunt
Head of Approvals — Physics

Chief Executive
Greg Cooper

Certificate amended on 12 January 2010 with a change to the product's thermal resistance value in section 5.1.

Regulations

In opinion of the BBA, Airtec Single and Airtec Double Cavity Wall Insulation, 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 2000 (as amended) (England and Wales)

Requirement:	B3(4)	Internal fire spread (structure)
Comment:		Walls incorporating the product can meet this Requirement. See sections 8.3, 8.6 to 8.8 of this Certificate.
Requirement:	C2(a)(b)(c)	Resistance to moisture
Comment:		Walls incorporating the product can meet this Requirement. See sections 3.2, 3.4 to 3.8, 6.1 and 6.3 of this Certificate. In addition the product may be used in situations where it bridges the dpc. See sections 7.1 and 7.2 of this Certificate.
Requirement:	L1(a)(i)	Conservation of fuel and power
Comment:		The product, used in wall, can contribute to a building meeting the Target Emission Rate. See sections 5.2 to 5.5 of this Certificate.
Requirement:	Regulation 7	Materials and workmanship
Comment:		The product is acceptable. See section 10 and the *Installation* part of this Certificate.

The Building (Scotland) Regulations 2004 (as amended)

Regulation:	8(1)	Fitness and durability of materials and workmanship
Comment:		The use of the product satisfies the requirements of this Regulation. See sections 9, 10 and the *Installation* part of this Certificate.
Regulation:	9	Building standards – construction
Standard:	2.4	Cavities
Comment:		Wall cavities incorporating the product must comply with this Standard, with reference to clauses 2.4.1[1], 2.4.2[1], 2.4.7[1] and 2.4.9[2]. See sections 8.3 and 8.8 of this Certificate.
Standard:	3.4	Moisture from the ground
Comment:		The product may be used where it bridges the dpc, with reference to clause 3.4.5[1][2]. See sections 7.1 and 7.2 of this Certificate.
Standard:	3.10	Precipitation
Comment:		Walls incorporating the product can satisfy this Standard, with reference to clause 3.10.3[1][2], provided they comply with sections 3.2, 3.4 to 3.8, 7.1 and 7.2 of this Certificate.
Standard:	3.15	Condensation
Comment:		The product can contribute to satisfying this Standard, with reference to clauses 3.15.1[1], 3.15.3[1] and 3.15.4[1]. See sections 6.2 and 6.3 of this Certificate.
Standard:	6.1(a)(b)	Carbon dioxide emissions
Standard:	6.2	Building insulation envelope
Comment:		The walls incorporating the product can satisfy or contribute to satisfying these Standards, with reference to clauses 6.1.1[1][2], 6.1.2[2], 6.1.6[1], 6.2.1[1][2] (Table 1), 6.2.3[1], 6.2.4[1][2] and 6.2.5[1]. See sections 5.2 to 5.5 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 acceptable. See section 10 and the *Installation* part of this Certificate.
Regulation:	B3(2)	Suitability of certain materials
Comment:		The product does not normally require maintenance. See section 9 of this Certificate.
Regulation:	C4	Resistance to ground moisture and weather
Comment:		Walls incorporating the product can satisfy this Regulation. See sections 3.2, 3.4 to 3.8, 7.1 and 7.2 of this Certificate. In addition, the product may be used where it bridges the dpc in either leaf.
Regulation:	C5	Condensation
Comment:		Walls incorporating the product can satisfy this Regulation. See section 6.3 of this Certificate. In addition the product may be used in situations where it bridges the dpc. See sections 7.1 and 7.2 of this Certificate.
Regulation:	E4	Internal fire spread — Structure
Comment:		Walls incorporating the product can meet this Regulation. See sections 8.3, 8.6 to 8.8 of this Certificate.
Regulation:	F2(a)(i)	Conservation measures
Regulation:	F3(2)	Targent carbon dioxide Emissions Rate
Comment:		The product will enable a wall to satisfy or contribute to satisfying this Regulation. See sections 5.2 to 5.5 of this Certificate.

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

In 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 2007

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

Zurich Building Guarantee Technical Manual 2007

In the opinion of the BBA, Airtec Single and Airtec Double Cavity Wall Insulation, when installed and used in accordance with this Certificate, satisfies the requirements of the *Zurich Building Guarantee Technical Manual*, Section 4 *Superstructure,* Sub-section *External Walls — Masonry, External walls — Thermal insulation.*

General

This Certificate relates to Airtec Single and Airtec Double Cavity Wall Insulation, for use in buildings up to and including 12 m in height, subject to the conditions contained in the *Design Considerations* part of this Certificate.

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

Technical Specification

1 Description

1.1 Airtec Single and Airtec Double Cavity Wall Insulation consist of polyethylene bubble film laminated with coated aluminium foil. Details of the two product types are given in Table 1.

Table 1 Product details

Product	Nominal thickness (mm)	No of polyethylene bubble sheets	Coated aluminium foil facing
Airtec Single	4	1	One side
Airtec Double	4	1	Both sides

1.2 The product is supplied in rolls 1.05 m, 1.2 m and 1.5 m wide and 25 m long.

1.3 Ancillary components include:

- Airtec YBS aluminium adhesive tape 50 m by 75 mm
- wall ties and insulation retaining clips for use with the products should be manufactured in accordance with BS EN 845-1 : 2003.

2 Delivery and site handling

2.1 The product is wrapped in polyethylene and labelled. The label details the date of manufacture and an instruction leaflet is enclosed.

2.2 The product should be stored upright on a firm, level and dry base and protected from damage in clean, dry conditions.

2.3 The product is combustible and care must be exercised when storing large quantities on site. The product must not be exposed to open flame or other ignition sources and must be stored away from flammable material such as paint and solvents.

Assessment and Technical Investigations

The following is a summary of the assessment and technical investigations carried out on Airtec Single and Airtec Double Cavity Wall Insulation.

Design Considerations

3 General

3.1 Airtec Single and Airtec Double Cavity Wall Insulation is effective in reducing the U value (thermal transmittance) of new 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 to incorporate the normal precautions to prevent moisture penetration.

3.2 Buildings subject to national Building regulations should be constructed in accordance with the relevant recommendations of:

- BS 5628-3 : 2005. In particular, Clauses 5.5 of the Code of Practice *Exclusion of water* 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(1)
- BS 8000-3 : 2001.

(1) The construction and detailing should comply with good practice as described in BBA joint publication *Cavity Insulation of Masonry Walls – Dampness Risks and How to minimise them*. They are particularly important in areas subject to severe driving rain.

3.3 Other buildings not subject to these regulations should also be built in accordance with the Standards given in section 3.2.

3.4 It is important that the following conditions are observed during construction and installation of the product:

- the product should only be installed when the first leaf has adequate strength
- the minimum total cavity should be 55 mm for Airtec Single and Airtec Double Cavity Wall Insulation, this can be reduced to 50 mm for Airtec Single (see section 3.7)
- approved methods of fixing must be used
- the second and consecutive runs of the products should have weathered laps of 75 mm minimum.

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

3.6 This Certificate covers the use of the product in any exposure zone subject to compliance with the conditions stated in section 3.4.

3.7 As with any other form of cavity wall insulation, where buildings need to comply with NHBC Standard 2007 or *Zurich Building Guarantee Technical Manual* 2007, Section 4 *Superstructure* specifiers should observe the requirements of these Standards.

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

4 Practicability of installation

The product can be installed easily by operatives experienced with this type of product.

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(1) report (BR 443 : 2006) *Conventions for U-value calculations*, using an emissivity of 0.07 of the foil equal to a cavity resistance value of 0.623 m^2KW^{-1} when installed with a 25 mm air space. A thermal resistance value of 0.124 m^2KW^{-1} for both Airtec Single and Double can be used. A thermal resistance (m^2KW^{-1}) of the products when installed with a minimum air space of 25 mm on either side for Airtec Double and the foil side of Airtec Single can be taken as:

Airtec Single	0.75 m^2KW^{-1}
Airtec Double	1.37 m^2KW^{-1}

(1) Building Research Establishment.

5.2 Most masonry cavity wall constructions incorporating the product will not achieve the maximum U value permitted in normal circumstances of 0.35 $Wm^{-2}K^{-1}$ in England, Wales and Northern Ireland. However, with the use of a high performance block leaf (for example, low thermal conductivity AAC, thickness greater than 100 mm, and thin jointing), this U value can be achieved.

5.3 When used in conjunction with additional insulation as appropriate, for example insulated dry lining or external wall insulation, the product can contribute to achieving the following design U values:

England and Wales

- 0.35 $Wm^{-2}K^{-1}$ required for 'notional' dwellings in SAP 2005 and buildings other than dwellings in SBEM (see also section 5.2)
- 0.35 $Wm^{-2}K^{-1}$ limit average specified in Approved Documents L1A (Table 2) and L2A (Table 4), and Technical Booklets F1 (Table 2.2) and F2 (Table 2.4) (see also section 5.2)
- 0.70 $Wm^{-2}K^{-1}$ limit for an individual element specified in Approved Documents L1A (Table 2) and L2A (Table 4) and Technical Booklets F1 (Table 2.4).

Scotland

- 0.20 $Wm^{-2}K^{-1}$ required for the 'simplified approach – solid fuel package 6' 'notional' dwelling in Mandatory Standard 6.1, clause 6.1.6(1)
- 0.25 $Wm^{-2}K^{-1}$ required for 'notional' dwellings SAP 2005 (for Scotland) and the 'simplified approach – packages 1 to 5' in Mandatory Standard 6.1, clause 6.1.6(1)
- 0.30 $Wm^{-2}K^{-1}$ limit average specified in Mandatory Standard 6.2, clause 6.2.1(1)(2)

- 0.70 $Wm^{-2}K^{-1}$ limit for an individual element specified in Mandatory Standard 6.2, clause 6.2.1[1][2].

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

5.4 Where a proposed wall U value is not better than the relevant 'notional' value specified in section 5.3, additional energy saving measures will be required in the building envelope and/or service to achieve the required overall carbon dioxide emission rate reduction of about 20% in dwellings (18% to 25% in Scotland) and 23% to 28% in buildings other than dwellings.

5.5 The product can contribute to maintaining continuity of thermal insulation at junctions between the external wall and the other building elements. Guidance in this respect, and on limiting heat loss by air infiltration, can be found in:

England and Wales — *Limiting thermal bridging and air leakage: Robust construction details for dwellings and similar buildings* TSO 2002

Scotland — Accredited Construction Details

Northern Ireland — Accredited Construction Details (version 1.0).

6 Condensation risk

Surface condensation

6.1 Walls will limit the risk of surface condensation adequately when the thermal transmittance (U value) does not exceed 0.7 $Wm^{-2}K^{-1}$ at any point, and the junctions with other elements are designed in accordance with the relevant requirements of TSO publication *Limiting thermal bridging and air leakage : Robust construction details for dwellings and similar buildings* TSO 2002 or BRE Information Paper IP 1/06 *Assessing the effects of thermal bridging at junctions and around openings*.

6.2 Walls and ceilings will adequately limit the risk of surface condensation when the thermal transmittance (U value) does not exceed 1.2 $Wm^{-2}K^{-1}$ at any point. Guidance may be obtained from Section 8 of the BS 5250 : 2002 and BRE report (BR 262 : 2002) *Thermal insulation: avoiding risks*.

Interstitial condensation

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

6.4 The product has a vapour resistance in excess of 600 $MNsg^{-1}$ and will therefore provide significant resistance to the passage of water vapour and would be considered a vapour control layer as defined in BS 5250 : 2002 provided all laps and joints are sealed. However, the overlapping joints between the strips of product will facilitate the passage of water vapour under normal conditions of temperature and humidity.

6.5 The use of the product does not preclude the normal precautions against formation of condensation, especially in rooms expected to have high humidity.

7 Liquid water penetration

7.1 When the product is used in situations where it bridges the dpc in walls, dampness from the ground will not pass through to the inner leaf provided the cavity 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 3.4.5[1][2]

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

Northern Ireland — Technical Booklet C, Section 1.6.

7.2 Constructions incorporating the product and 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 3.10.3[1][2]

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

Northern Ireland — Regulation C, Section 2.

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

- wall ties and fixings are installed correctly and are thoroughly clean
- excess mortar is cleaned from the cavity face of the leading leaf and any debris removed from the cavity
- installation is carried out to the highest level on each wall or the top edge of the insulation is protected by a cavity tray
- all the usual precautions for draining penetrated water are taken, for example, above tie beams, projecting floor beams and window sills

- all horizontal laps are weathered to the outside
- where the product is used in detail situations, for example, vertical dpc at windows and doors, they will be effective in resisting rain penetration.

8 Behaviour in relation to fire

8.1 The use of the product in the context of this Certificate does not prejudice fire-resistance properties of the wall.

8.2 Although the product is combustible it is difficult to ignite.

8.3 As with other combustible cavity wall insulation materials, naked flames or sparks should not be allowed near the material either whilst in storage or during installation. If work requiring the use of naked flame, for example a blowtorch, is necessary, this should be carried out at least 300 mm from the closed cavity.

8.4 Cavity walls should always have a cavity closer at the top of the cavity and around openings. The materials must not be taken past fire stops or cavity area only. 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.

8.5 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 an unventilated cavity, the amount of air present will be insufficient to support combustion, and flame spread will be minimal.

8.6 The requirements of the Building Regulations relating to fire spread 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 3.5.

8.7 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 wide (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 should be placed in, or exposed to, the cavity:
  - timber lintels, window or door frames, or end of timber joists
  - pipe, conduit or cables
  - dpc, flashing, cavity closer or wall tie
  - 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.

8.8 For constructions not covered by sections 8.6 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], 2.4.2[1], 2.4.7[1] and 2.4.9[2]

(1) Technical Handbook (Domestic).

(2) Technical Handbook (Non-Domestic).

Northern Ireland — Technical Booklet E, Paragraphs 3.35 to 3.39.

9 Maintenance

As the product is confined within the wall cavity and has suitable durability, maintenance is not required.

10 Durability

When correctly installed, the product is rot-proof and durable and should remain effective as an insulant for the life of the building.

Installation

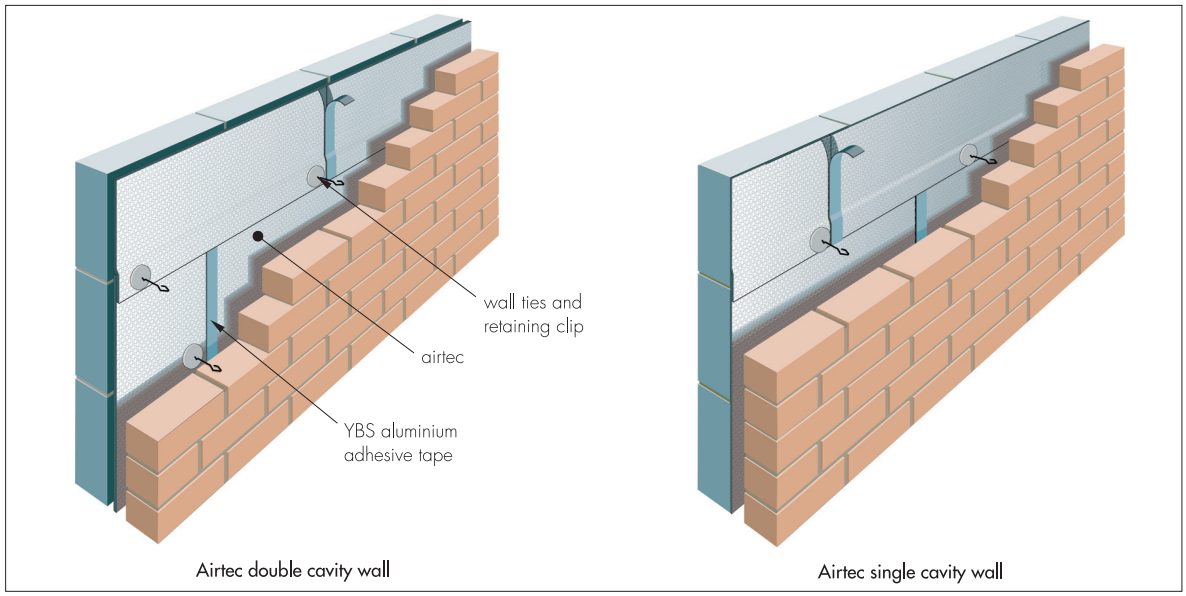
11 General

11.1 The walls are constructed leading with either the inner or outer leaf. It is recommended that the inner leaf be constructed ahead of the outer leaf as this will ensure the laps are weathered to the outside (see Figure 1).

11.2 The fixing of the product at the top of the wall will depend on the method of cavity closure, but the product can be dressed under the brick capping course.

11.3 The product can be dressed under sills but with regard to cavity trays, should be flush to the outer face, as with lintels or flanges of meter boxes and service penetrations.

Figure 1 Typical installation detail



12 Procedure

Airtec Double

12.1 The leading leaf should be constructed to a height of approximately 1.2 m (five blocks) above dpc level.

12.2 The wall ties (see section 1.4) should be installed in accordance with BS 5628-3 : 2005, with special attention to eaves and openings where closer spacing of wall ties will be necessary.

12.3 The stop of the wall tie is butted against the inner leaf and this creates the minimum cavity between the product and the blockwork.

12.4 It is essential that extra care is taken by building operatives when the exposed ends of the wall ties could pose a risk of injury. Eye protection is recommended.

12.5 Once the blockwork has attained adequate strength, the initial run of product is positioned over the wall ties, ensuring that it is kept taut but with sufficient drop to below floor insulation. The product can be cut with a sharp blade to fit onto wall ties.

12.6 The top edge of the product should be a minimum of 75 mm over the top row of the wall ties giving a weathered lap joint.

12.7 When a full run is in position, the retaining clip is fixed to the wall tie to keep the product central to the cavity.

12.8 The second leaf is built up to the topmost line of the wall ties, (or two courses below) and the second run of product installed ensuring a minimum lap of 75 mm.

12.9 Vertical joints in the product should always be on a line of wall ties, ensuring a 100 mm lap (ie 50 mm either side of the wall tie).

12.10 All vertical joints are sealed using approved tape (see section 1.3).

12.11 At door and window openings the product can be butted against the cavity closer or brought through the closed reveal to act as an insulating dpc.

12.12 At internal and external corners a minimum air space of 25 mm must be maintained.

Airtec Single

12.13 Installation is in the same manner as Airtec Double but as it is secured against the inner leaf with the foil face facing the cavity, the stop on the wall tie is not used.

Mortar droppings

12 14 After each section of the leading leaf is built, excess mortar must be removed from the cavity face and mortar droppings cleaned from exposed coated face of the product, before the installation of the next run. Use of a cavity board or a cavity batten will protect the installed product and help keep the cavity clean as the following leaf is built.

12.15 All building involving the product, particularly work which is interrupted, must conform to BS 5628-3 : 2005, Sections A4.1.3.2, A4.1.3.9, A5.1.1.3 and A5.4.4.

13 Investigations

Tests and assessment were carried out to determine:

- water vapour resistance
- durability
- thermal resistance
- condensation risk analysis
- emissivity
- suitability of wall ties.

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 EN 845-1 : 2003 *Specification for ancillary components for masonry — Ties, tension straps, hangers and brackets*

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

Conditions of Certification

14 Conditions

14.1 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.

14.2 References in this Certificate to any Act of Parliament, Statutory Instrument, Directive or Regulation of the European Union, British, European or International Standard, Code of Practice, manufacturers' instructions or similar publication, are references to such publication in the form in which it was current at the date of this Certificate.

14.3 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.

14.4 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.

14.5 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.

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BBA BRITISH BOARD OF AGRÉMENT
TECHNICAL APPROVALS FOR CONSTRUCTION

Agrément Certificate
No 08/4565

ALUMINIUM FOIL BUBBLE INSULATION

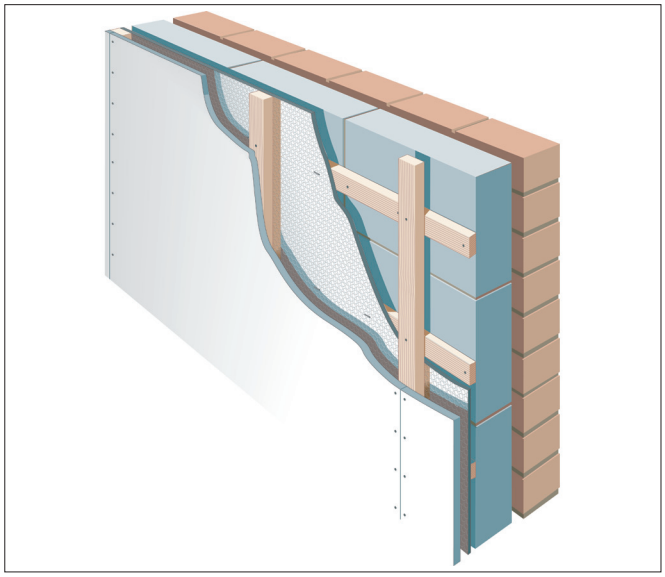
PRODUCT SHEET 2 — AIRTEC SINGLE AND AIRTEC DOUBLE DRY LINING WALL INSULATION

PRODUCT SCOPE AND SUMMARY OF CERTIFICATE

This Certificate relates to Airtec Single and Airtec Double Dry Lining Wall Insulation, a foil-faced bubble sheet for use as dry lining.

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

Thermal performance — the product can be used to improve the thermal performance of wall construction (see section 5).

Condensation risk — performance of the product with regard to interstitial and surface condensation has been considered (see section 6).

Behaviour in relation to fire — the product does not prejudice the fire resistance properties of the wall (see section 7).

Durability — the design life of the product under typical UK conditions has been considered and the product will remain effective as an insulant for the life of the building (see section 12).

The BBA has awarded this Agrément Certificate for the Airtec Single and Airtec Double Dry Lining Wall Insulation to YBS Insulation Ltd as fit for its intended use provided it is installed, used and maintained as set out in this Agrément Certificate.

On behalf of the British Board of Agrément

Date of First issue: 9 June 2008

Chris Hunt
Head of Approvals — Physics

Chief Executive
Greg Cooper

Certificate amended on 12 January 2010 with a change to the product's thermal resistance value in section 5.1.

Regulations

In opinion of the BBA, Airtec Single and Airtec Double Dry Lining Wall Insulation, 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 2000 (as amended) (England and Wales)

Requirement:	C2(c)	Resistance to moisture
Comment:		Walls incorporating the product can meet this Requirement. See sections 6.1 and 6.3 of this Certificate.
Requirement:	L1(a)(i)	Conservation of fuel and power
Comment:		The product, used in wall, can contribute to a building meeting the Target Emission Rate. See sections 5.2 to 5.4 of this Certificate.
Requirement:	Regulation 7	Materials and workmanship
Comment:		The product is acceptable. See section 12 and the *Installation* part of this Certificate.

The Building (Scotland) Regulations 2004 (as amended)

Regulation:	8(1)	Fitness and durability of materials and workmanship
Comment:		The use of this product satisfies the requirements of this Regulation. See sections 11 and 12 and the *Installation* part of this Certificate.
Regulation:	9	Building standards – construction
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 sections 6.2 and 6.3 of this Certificate.
Standard	6.1(a)(b)	Carbon dioxide emissions
Standard	6.2	Building insulation envelope
Comment:		The walls incorporating the product can satisfy or contribute to satisfying these Standards, with reference to clauses 6.1.1[1][2], 6.1.2[2], 6.1.6[1], 6.2.1[1][2] (Table 1), 6.2.3[1], 6.2.4[1][2] and 6.2.5[1]. See sections 5.2 to 5.4 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 acceptable. See section 12 and the *Installation* part of this Certificate.
Regulation:	B3(2)	Suitability of certain materials
Comment:		The product does not normally require maintenance. Sees section 11 of this Certificate.
Regulation:	C5	Condensation
Comment:		Walls incorporating the product can satisfy this Regulation. See sections 6.3, 8.1 to 8.3 of this Certificate. In addition the product may be used in situations where it bridges the dpc. See section 8.2 of this Certificate.
Regulation:	F2(a)(i)	Conservation measures
Regulation:	F3(2)	Target carbon dioxide Emissions Rate
Comment:		The product will enable a wall to satisfy or contribute to satisfying this Regulation. See sections 5.2 to 5.4 of this Certificate.

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

In 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 2007

NHBC accepts the use of Airtec Single and Airtec Double Dry Lining Wall Insulation, when installed and used in accordance with this Certificate, in relation to *NHBC Standards*, Chapter 6.3, *Internal walls.*

Zurich Building Guarantee Technical Manual 2007

In the opinion of the BBA, Airtec Single and Airtec Double Dry Lining Wall Insulation, when installed and used in accordance with this Certificate, satisfies the requirements of the *Zurich Building Guarantee Technical Manual*, Section 5 *Internal/External works, services & finishes*, Sub-section *Internal works – walls.*

General

This Certificate relates to Airtec Single and Airtec Double Dry Lining Wall Insulation, for use in buildings up to and including 12 m in height, subject to the conditions contained in the *Design Considerations* part of this Certificate.

Technical Specification

1 Description

1.1 Airtec Single and Airtec Double Dry Lining Wall Insulation consist of polyethylene bubble film laminated with coated aluminium foil. Details of the two product types are given in Table 1.

Table 1 Product details

Product	Nominal thickness (mm)	No of polyethylene bubble sheets	Aluminium foil
Airtec Single	4	1	One side
Airtec Double	4	1	Both sides

1.2 The product is supplied in rolls 1.05 m, 1.2 m and 1.5 wide and 25 m long.

1.3 Ancillary components include:

- Airtec YBS aluminium adhesive tape
- screws
- preservative-treated battens
- nails or staples.
- plasterboard to BS EN 520 : 2004

2 Delivery and site handling

2.1 The product is wrapped in polyethylene and labelled. The label details, date of manufacture and an instruction leaflet is enclosed.

2.2 The product should be stored upright on a firm, level and dry base and protected from damage in clean, dry conditions.

2.3 The product is combustible and care must be exercised when storing large quantities on site. The product must not be exposed to open flame or other ignition sources and must be stored away from flammable material such as paint and solvents.

Assessment and Technical Investigations

The following is a summary of the assessment and technical investigations carried out on Airtec Single and Airtec Double Dry Lining Wall Insulation.

Design Considerations

3 General

3.1 Airtec Single and Airtec Double Dry Lining Wall Insulation will significantly improve the thermal insulation of existing and new, solid or cavity masonry walls (masonry includes clay and calcium silicate bricks, concrete blocks, natural and reconstituted stone blocks) of dwellings and buildings of similar occupancy, type and condition.

3.2 The walls of new buildings must be designed and constructed in accordance with the relevant Codes of Practice, eg BS 5628-3 : 2005 and recommendation of BS 8000-3 : 2001.

3.3 The walls must be in a good state of repair and without evidence of rain penetration or damp (other than surface condensation) or frost damage.

3.4 The installation of insulated dry lining systems requires careful detailing around doors and windows to achieve a satisfactory surface for finishing. In addition, every attempt should be made to minimise the risk of thermal bridging at reveals and where heavy separating walls are attached to the external wall. In new work the construction must be designed to accommodate the thickness of the dry lining, particularly at reveals, heads, sills and in relation to ceiling height.

3.5 Where dry lining installations form a void, services can be incorporated behind the dry lining, making chasing of the wall unnecessary. Where possible, penetration of the products by services, such as light switches or power outlets, should be kept to a minimum to limit possible penetration of water vapour.

3.6 When the product is to be used in existing buildings it should be realised that a small reduction in room size will occur and that permanent fixtures (for example baths) may present difficulties.

3.7 Installation of plasterboard must be in accordance with the relevant sections of BS 8212 : 1995.

4 Practicability of installation

The product can be installed easily by operatives experienced with this type of product.

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[1] report (BR 443 : 2006) *Conventions for U-value calculations*, using an emissivity of 0.07 of the foil equal to a cavity resistance value of 0.623 m^2 KW^{-1} when installed with a 25 mm air space. A thermal resistance value of 0.124 m^2KW^{-1} for both Airtec Single and Double can be used. A thermal resistance (m^2KW^{-1}) of the products when installed with a minimum air space of 25 mm on either side for Airtec Double and the foil side of Airtec Single can be taken as:

Airtec Single	0.75 m^2KW^{-1}
Airtec Double	1.37 m^2KW^{-1}

(1) Building Research Establishment.

5.2 When used in conjunction with additional insulation as appropriate, for example cavity wall insulations or external wall insulation, the product can contribute to a wall construction achieving the following design U values:

England and Wales

- 0.35 $Wm^{-2}K^{-1}$ required for 'notional' dwellings in SAP 2005 and buildings other than dwellings in SBEM
- 0.35 $Wm^{-2}K^{-1}$ limit average specified in Approved Documents L1A (Table 2) and L2A (Table 4), and Technical Booklets F1 (Table 2.2) and F2 (Table 2.4)
- 0.70 $Wm^{-2}K^{-1}$ limit for an individual element specified in Approved Documents L1A (Table 2) and L2A (Table 4 and Technical Booklets F1 (Table 2.4).

Scotland

- 0.20 $Wm^{-2}K^{-1}$ required for the 'simplified approach – solid fuel package 6' 'notional' dwelling in Mandatory Standard 6.1, clause 6.1.6[1]
- 0.25 $Wm^{-2}K^{-1}$ required for 'notional' dwellings SAP 2005 (for Scotland) and the 'simplified approach – packages 1 to 5' in Mandatory Standard 6.1, clause 6.1.6[1]
- 0.30 $Wm^{-2}K^{-1}$ limit average specified in Mandatory Standard 6.2, clause 6.2.1[1][2]
- 0.70 $Wm^{-2}K^{-1}$ limit for an individual element specified in Mandatory Standard 6.2, clause 6.2.1[1][2].

(1) Technical Handbook (Domestic).

(2) Technical Handbook (Non-Domestic).

5.3 Where a proposed wall U value is not better than the relevant 'notional' value specified in section 5.2, additional energy saving measures will be required in the building envelope and/or service to achieve the required overall carbon dioxide emission rate reduction of about 20% in dwellings (18% to 25% in Scotland) and 23% to 28% in buildings other than dwellings.

5.4 The product can contribute to maintaining continuity of thermal insulation at junctions between the external wall and the other building elements. Guidance in this respect, and on limiting heat loss by air infiltration, can be found in:

England and Wales — *Limiting thermal bridging and air leakage: Robust construction details for dwellings and similar buildings* TSO 2002

Scotland — Accredited Construction Details

Northern Ireland — Accredited Construction Details (version 1.0).

6 Condensation risk

Surface condensation

6.1 Walls will limit the risk of surface condensation adequately when the thermal transmittance (U value) does not exceed 0.7 $Wm^{-2}K^{-1}$ at any point, and the junctions with other elements are designed in accordance with the relevant requirements of TSO publication *Limiting thermal bridging and air leakage : Robust construction details for dwellings and similar buildings* TSO 2002 or BRE Information Paper IP 1/06 *Assessing the effects of thermal bridging at junctions and around openings*.

6.2 Walls and ceilings will adequately limit the risk of surface condensation when the thermal transmittance (U value) does not exceed 1.2 $Wm^{-2}K^{-1}$ at any point. Guidance may be obtained from Section 8 of the BS 5250 : 2002 and BRE report (BR 262 : 2002) *Thermal insulation: avoiding risks.*

Interstitial condensation

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

6.4 The product has a vapour resistance in excess of 600 $MNsg^{-1}$ and will therefore provide significant resistance to the passage of water vapour and would be considered a vapour control layer as defined in BS 5250 : 2002 provided all laps and joints are sealed. However, the overlapping joints between the strips of product will facilitate the passage of water vapour under normal conditions of temperature and humidity.

6.5 The use of the product does not preclude the normal precautions against formation of condensation, especially in rooms expected to have high humidity.

6.6 When using these types of product due consideration must be taken of the overall installation to minimise perforations by services, eg light switches and power outlets, and the joints at ceiling and skirting level must be well sealed. The use of Airtec YBS aluminium tape enables the vapour barrier to be completed.

6.7 As with any other insulation applied to the inside of a wall, there may be risk of thermal bridging from the floor or ceiling, particularly in concrete slabs construction. It has been demonstrated that the use of coving at the wall ceiling point will significantly reduce the problem.

6.8 Insulated dry lining has been successfully used in the rehabilitation of buildings suffering from surface condensation of walls where the dampness has been caused by the lack of thermal insulation.

7 Infestation

The use of insulated dry lining does not in itself promote infestation. The creation of voids may provide habitation for insects or rodents in areas already infested. Care should be taken to ensure that, wherever possible, all voids are sealed as any infestation may be difficult to eradicate. There is no food value in the materials used.

8 Behaviour in relation to fire

8.1 The position of the system with regard to the national Building Regulations and Standards is dependent upon the rating of the plasterboard which must meet the necessary Class 0 (Low risk in Scotland) requirements. Details of such situations are contained in the relevant documents.

8.2 When installed, the product will be contained by the lining board until these layers are destroyed. Therefore, the product will not contribute to the development stages of a fire.

8.3 Although the product is combustible it is difficult to ignite. When used in the context of this Certificate, they are unlikely to become ignited within the cavity; if fire does penetrate into an unventilated cavity, the amount of air present within the cavity will be insufficient to support combustion and flame spread will be minimal.

9 Impact resistance

Resistance to impact damage will vary with the thickness of plasterboard used. However, the minimum batten spacings detailed in section 13.2 will provide reasonable resistance to such damage.

10 Wall-mounted fittings

Any object fixed to the wall, other than lightweight items, such as framed pictures, must be fixed through the lining board into the solid wall, or into a batten, using recommended proprietary fixings.

11 Maintenance

As the product is confined within the wall cavity and has suitable durability, maintenance is not required.

12 Durability

The durability of the materials is satisfactory. Provided the product is fixed to satisfactory stable and durable backgrounds, it should have a life equal to the building in which it is installed. Under normal conditions of occupancy a dry lining system is unlikely to suffer damage, but should damage occur, repairs can be made easily.

Installation

13 General

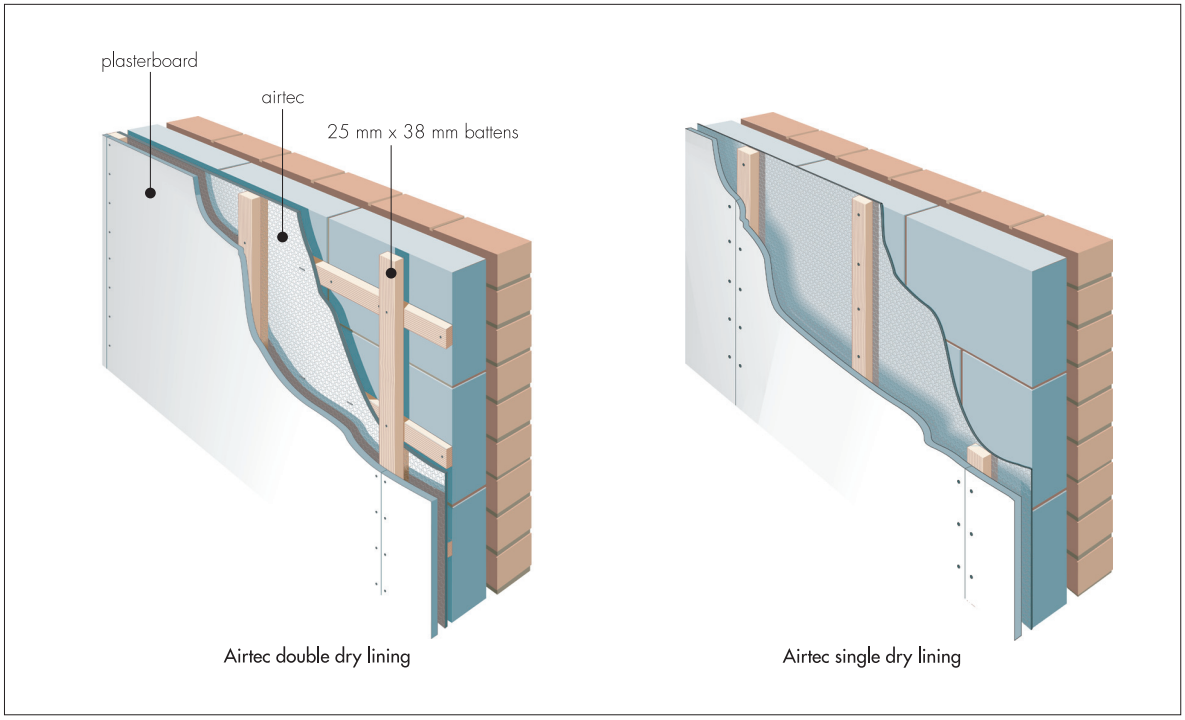
13.1 The surfaces of masonry wall should be sound and free from loose material; large projections should be removed and holes filled and levelled. A survey of the wall may be required to establish the extent of any packing that may be required to ensure a uniform plane for the product to be fixed.

13.2 Bearing surfaces for timber battens comply with BS 8212 : 1995. The depth of timber battens will determine the air space achieved on either side of the product. The thickness of both Airtec Single and Airtec Double Dry Lining Wall Insulation must be considered as part of the design specification to achieve the required air space (see Figure 1).

13.3 All joints and perforations in the product must be securely sealed with the Airtec YBS aluminium tape (see section 1.3).

13.4 Pre-lagged water pipes may be accommodated within the void created by the dry lining system.

Figure 1 Typical installation detail



14 Procedure

Airtec Single

14.1 Vertical counter battens, minimum 25 mm by 38 mm battens (Tanalized in accordance with BS 5268-5 : 1989) are fixed to the wall at 400 mm centres. Battens must always be placed at the top and bottom of the wall and around the perimeter of doors and windows.

14.2 The product is applied directly from the roll either vertically or horizontally depending on the wall height, pulled tight and stapled onto the battens at minimum 300 mm centres. The foil side of the material should face the cavity.

14.3 The product should be butt-jointed onto the battens and sealed using the Airtec YBS aluminium tape.

14.4 The plasterboard is fixed over the product and onto the battens in the usual manner.

14.5 Alternatively, the product (foil face facing the cavity) can be retained directly against the wall by battens at minimum 300 mm centres. The plasterboard is placed on top of the battens.

Airtec Double

14.6 The procedure as described in sections 14.1 to 14.3 is followed and in addition, counter battens are fixed to the wall battens through the product. Plasterboard is then fixed to the battens in the usual manner. The foil sides of the material will be facing the cavities formed by the use of the battens.

Technical Investigations

15 Investigations

Tests and assessment were carried out to determine:

- water vapour resistance
- durability
- thermal resistance
- condensation risk analysis
- emissivity
- suitability of wall ties.

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 8212 : 1995 *Code of practice for dry lining and partioning using Gypsum Plasterboards*

BS EN 520 : 2004 *Gypsum Plasterboards — definitions, requirements and test methods*

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

16 Conditions

16.1 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.

16.2 References in this Certificate to any Act of Parliament, Statutory Instrument, Directive or Regulation of the European Union, British, European or International Standard, Code of Practice, manufacturers' instructions or similar publication, are references to such publication in the form in which it was current at the date of this Certificate.

16.3 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.

16.4 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.

16.5 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.

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BBA APPROVAL INSPECTION TESTING CERTIFICATION
TECHNICAL APPROVALS FOR CONSTRUCTION

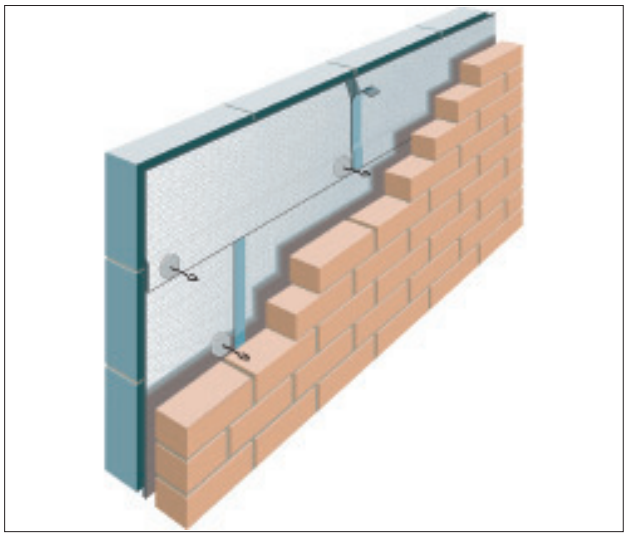
Agrément Certificate
08/4565
Product Sheet 3

YBS ALUMINIUM FOIL BUBBLE INSULATION

AIRTEC DOUBLE DOUBLE BUBBLE CAVITY WALL INSULATION

PRODUCT SCOPE AND SUMMARY OF CERTIFICATE

This Certificate relates to Airtec Double Double Bubble Cavity Wall Insulation installed centrally within the cavity, during construction and retained by wall ties fitted with snap on plastic clips. The product is for use in building constructions up to 25 m in height above damp-proof course level and where the residual cavity is maintained to a minimum designed width of 50 mm.



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 investigation
- design considerations
- installation guidance
- regular surveillance of production
- formal three-yearly review.

KEY FACTORS ASSESSED

Thermal performance — the product can be used to improve the thermal performance of a wall construction (see section 5).

Condensation risk — the performance of the product with regard to interstitial and surface condensation has been considered (see section 6).

Liquid water penetration — the performance of the product with regard to liquid water penetration has been considered (see section 7).

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

Durability — the product is rot-proof, dimensionally stable and durable and will remain effective as an insulant for the life of the building (see section 10).

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

Date of First issue: 8 May 2009

Chris Hunt
Head of Approvals — Physics

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, Airtec Double Double Bubble Cavity Wall Insulation, 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 2000 (as amended) (England and Wales)

Requirement:	B3(4)	Internal fire spread (Structure)
Comment:		Walls incorporating the product can meet this Requirement. See sections 8.3 to 8.5 of this Certificate.
Requirement:	C2(a)(b)(c)	Resistance to moisture
Comment:		The product can contribute to satisfying this Requirement. See sections 3.2, 3.4 to 3.8, 6.1, 6.3, 7.1 and 7.2 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 5.5 of this Certificate.
Requirement:	Regulation 7	Materials and workmanship
Comment:		The product is acceptable. See section 10 and the *Installation* part of this Certificate.

The Building (Scotland) Regulations 2004 (as amended)

Regulation:	8(1)(2)	Fitness and durability of materials and workmanship
Comment:		The product can contribute to a construction satisfying this Regulation. See sections 9, 10 and the *Installation* part of this Certificate.
Regulation:	9	Building standards — Construction
Standard:	2.4	Cavities
Comment:		A wall containing the product must comply with this Standard, with reference to clauses 2.4.1[(1)(2)], 2.4.7[(1)], 2.4.1[(1)(2)] and 2.4.9[(2)]. See sections 8.3, 8.5 and 8.6 of this Certificate.
Standard:	3.4	Moisture from the ground
Comment:		The product does not absorb water by capillarity actions and, therefore, may be used where it bridges the dpc of either leaf, with reference to clause 3.4.5[(1)(2)] to this Standard. See sections 7.1 and 7.2 of this Certificate.
Standard:	3.10	Precipitation
Comment:		Walls incorporating the product can satisfy this Standard, with reference to clauses 3.15.1[(1)], 3.15.4[(1)] and 3.15.5[(1)]. See sections 3.2, 3.4 to 3.8, 7.1 and 7.2 of this Certificate.
Standard:	3.15	Condensation
Comment:		Walls incorporating the product can satisfy this Standard, with reference to clauses 3.15.1[(1)], 3.15.4[(1)] and 3.15.5[(1)]. See sections 6.2 and 6.3 of this Certificate.
Standard:	6.1(a)(b)	Carbon dioxide emissions
Standard:	6.2	Building insulation envelope
Comment:		Walls incorporating the product can satisfy, or contribute to satisfying this Standard, with reference to clause 6.1.2[(1)(2)], 6.1.3[(2)], 6.1.6[(1)], 6.2.1[(1)(2)],6.2.3[(1)], 6.2.4[(1)(2)], 6.2.9[(1)], 6.2.10[(2)], 6.2.11[(1)] and 6.2.12[(2)]. See sections 5.2 to 5.5 of this Certificate.
Regulation:	12	Building standards — conversions
Comment:		All comments given for this product under Regulation 9, also apply to this Regulation, with reference to clause 0.12.1[(1)] and Schedule 6[(1)].

(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 acceptable. See section 10 and the *Installation* part of this Certificate.
Regulation:	B3(2)	Suitability of certain materials
Comment:		The product is acceptable. See section 9 of this Certificate.
Regulation:	C4	Resistance to ground moisture and weather
Comment:		Walls incorporating the product can satisfy this Regulation. See sections 3.2, 3.4 to 3.8, 7.1and 7.2 of this Certificate.
Regulation:	C5	Condensation
Comment:		The product can contribute to satisfying this Regulation. See sections 6.3, 7.1 and 7.2 of this Certificate.
Regulation:	E4	Internal fire spread
Comment:		Walls incorporating the product can meet this Regulation. See sections 8.3 to 8.5 of this Certificate.
Regulation:	F2(a)(i)	Conservation measures
Regulation:	F3(2)	Target carbon dioxide Emissions Rate
Comment:		The product can contribute to a building satisfying its target emission rate. See sections 5.2 to 5.5 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 2008

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

Zurich Building Guarantee Technical Manual 2007

In the opinion of the BBA, Airtec Double Double Bubble Cavity Wall Insulation, when installed and used in accordance with this Certificate, satisfies the requirements of the *Zurich Building Guarantee Technical Manual*, Section 4 *Superstructure*, Sub-section *External Walls — masonry* and *External walls — thermal insulation*.

General

This Certificate relates to Airtec Double Double Bubble Cavity Wall Insulation, a double-layer polyethylene bubble sheet faced on both sides with aluminium foil, for use as thermal insulation in buildings up to and including 25 m in height, subject to the conditions contained in the *Design Considerations* part of this Certificate. A clear air space of at least 20 mm must be maintained between the Airtec Double Double Bubble and the inner leaf construction.

Technical Specification

1 Description

1.1 Airtec Double Double Bubble Cavity Wall Insulation consists of two layers of polyethylene bubble sheet faced on both sides with aluminium foil.

1.2 The product is supplied in rolls 1.05 m, 1.2 m or 1.5 m wide and 25 m long. The product has an approximate thickness of 7 mm.

1.3 Ancillary components include:

- YBS aluminium adhesive tape 50 m by 75 mm
- Wall ties and insulation retaining clips for use with the products should be manufactured in accordance with BS EN 845-1 : 2003.

2 Delivery and site handling

2.1 The product is wrapped in polyethylene and labelled. The label details the date of manufacture and an instruction leaflet is enclosed.

2.2 The product should be stored upright on a firm, level and dry base and protected from damage in clean, dry conditions.

2.3 The product should be stored off the ground and under cover to protect it from precipitation in clean, dry conditions.

2.4 Since the product is combustible, care must be exercised when storing large quantities on site. The product must not be exposed to open flame or other ignition sources and must be stored away from flammable material such as paint and solvents.

Assessment and Technical Investigations

The following is a summary of the assessment and technical investigations carried out on Airtec Double Double Bubble Cavity Wall Insulation.

Design Considerations

3 General

3.1 Airtec Double Double Bubble Cavity Wall Insulation is effective in reducing the thermal transmittance (U value) of new external cavity walls with masonry inner and outer leaves (where masonry includes clay and calcium silicate bricks, concrete blocks and natural and reconstituted stone blocks). It is essential that such walls are designed and constructed to incorporate the normal precautions to prevent moisture penetration.

3.2 New buildings subject to national Building Regulations and Standards should be suitable when assessed in accordance with the relevant recommendations of:

- BS 5628-3 : 2005. In particular, Clause 5.5.2 *Exclusion of water* of the Code of practice should be followed in that the designer selects a construction appropriate to the local wind-driven rain index paying due regard to the design detailing, workmanship and materials to be used(1).
- BS 8000-3 : 2001.

(1) The construction and detailing should comply with good practice as described in BBA joint publication *Cavity Insulation of Masonry Walls — Dampness Risks and How to minimise them*. They are particularly important in areas subject to severe driving rain.

3.3 Other new buildings not subjected to any of the above should also be built in accordance with BS 5628-3 : 2005 and BS 8000-3 : 2001.

3.4 It is important that the following conditions are observed during construction and installation of the product:

- the product should only be installed when the first leaf has adequate strength
- the minimum total cavity should be 50 mm
- approved methods of fixing must be used
- the second and consecutive runs of the products should have weathered laps of 75 mm minimum.

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

3.6 This Certificate covers the use of the product in any exposure zone subject to compliance with the conditions stated in section 3.4.

3.7 As with any other form of cavity wall insulation, where buildings need to comply with *NHBC Standard* 2008 or *Zurich Building Guarantee Technical Manual* 2007, Section 4 *Superstructure*, specifiers should observe the requirements of these Standards.

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

4 Practicability of installation

The product is designed to be installed by a competent general builder, or a contractor, experienced with this type of product.

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(1) report (BR 443 : 2006). Conventions for U-value calculations, using an emissivity of 0.07 of the foil equal to a cavity resistance value of 0.623 m^2KW^{-1} when installed with a 25 mm air space. A thermal resistance value of 0.17 m^2KW^{-1} per layer can be used.

(1) Building Research Establishment.

5.2 Most masonry cavity wall constructions incorporating the product will not achieve the maximum U value permitted in normal circumstances of 0.35 $Wm^{-2}K^{-1}$ in England, Wales and Northern Ireland. However, with the use of a high performance block leaf (for example, low thermal conductivity AAC, thickness greater than 100 mm, and thin jointing), this U value can be achieved.

5.3 When used in conjunction with additional insulation as appropriate, for example insulated dry lining or external wall insulation, the product can contribute to achieving the following design U values:

England and Wales and Northern Ireland

- 0.35 $Wm^{-2}K^{-1}$ required for 'notional' dwellings in SAP 2005 and buildings other than dwellings in SBEM (see also section 5.2)
- 0.35 $Wm^{-2}K^{-1}$ limit average specified in Approved Documents L1A (Table 2) and L2A (Table 4) and Technical Booklets F1 (Table 2.2) and F2 (Table 2.4) (see also section 5.2)
- 0.70 $Wm^{-2}K^{-1}$ limit for an individual element specified in Approved Documents L1A (Table 2) and L2A (Table 4) and Technical Booklets F1 (Table 2.4).

Scotland

- 0.20 $Wm^{-2}K^{-1}$ required for the 'simplified approach – solid fuel package 6' 'notional' dwelling in Mandatory
- Standard 6.1, clause 6.1.6(1)
- 0.25 $Wm^{-2}K^{-1}$ required for 'notional' dwellings SAP 2005 (for Scotland) and the 'simplified approach – packages 1 to 5' in Mandatory Standard 6.1, clause 6.1.6(1)
- 0.30 $Wm^{-2}K^{-1}$ limit average specified in Mandatory Standard 6.2, clause 6.2.1(1)(2)
- 0.70 $Wm^{-2}K^{-1}$ limit for an individual element specified in Mandatory Standard 6.2, clause 6.2.1(1)(2).

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

5.4 Where a proposed wall U value is not better than the relevant 'notional' value specified in section 5.3, additional energy saving measures will be required in the building envelope and/or service to achieve the required overall carbon dioxide emission rate reduction of about 20% in dwellings (18% to 25% in Scotland) and 23% to 28% in buildings other than dwellings.

5.5 The product can contribute to maintaining continuity of thermal insulation at junctions between the external wall and the other building elements. Guidance in this respect, and on limiting heat loss by air infiltration, can be found in:

England and Wales — *Limiting thermal bridging and air leakage: Robust construction details for dwellings and similar buildings* TSO 2002

Scotland — Accredited Construction Details

Northern Ireland — Accredited Construction Details (version 1.0).

6 Condensation

Surface condensation

6.1 Walls will limit the risk of surface condensation adequately when the thermal transmittance (U value) does not exceed 0.7 $Wm^{-2}K^{-1}$ 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.

6.2 For buildings in Scotland, constructions will be acceptable where the thermal transmittance (U value) of the wall does not exceed 1.2 $Wm^{-2}K^{-1}$ at any point and openings and junctions with other elements comply with the guidance given in BS 5250 : 2002, Section 8, BRE report (BR 262 : 2002) *Thermal insulation: avoiding risks*.

Interstitial condensation

6.3 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.

6.4 The product has a nominal vapour resistance exceeding 500 $MNsg^{-1}$ and, therefore, the product will provide a significant resistance to water vapour transmission. Joints between the product will facilitate the passage of water vapour under normal conditions of temperature and humidity.

6.5 The use of the product does not preclude the normal precautions against formation of condensation, especially in rooms expected to have high humidity.

7 Liquid water penetration

7.1 When the product is used in situations where it bridges the dpc in walls, dampness from the ground will not pass through to the inner leaf provided the cavity 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 3.4.5[1][2]

(1) Technical Handbook (Domestic).

(2) Technical Handbook (Non-Domestic).

Northern Ireland — Technical Booklet C, Section 1.6.

7.2 Constructions incorporating the product and 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 3.10.3[1][2]

(1) Technical Handbook (Domestic).

(2) Technical Handbook (Non-Domestic).

Northern Ireland — Regulation C, Section 2.

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

- wall ties and fixings are installed correctly and are thoroughly clean
- excess mortar is cleaned from the cavity face of the leading leaf and any debris removed from the cavity
- installation is carried out to the highest level on each wall or the top edge of the insulation is protected by a cavity tray
- all the usual precautions for draining penetrated water are taken, for example, above tie beams, projecting floor beams and window sills
- all horizontal laps are weathered to the outside
- where the product is used in detail situations, for example, vertical dpc at windows and doors, they will be effective in resisting rain penetration.

8 Behaviour in relation to fire

8.1 The product does not prejudice the fire-resistance properties of the wall. Although the product is combustible, it is unlikely to become ignited within the cavity when used in the context of this Certificate.

8.2 Cavity walls should always have a cavity closer at the top of the cavity and around openings. The materials must not be taken past fire stops or cavity area only. 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.

8.3 As with other combustible cavity wall insulation materials, naked flames or sparks should not be allowed near the material either whilst in storage or during installation. If work requiring the use of naked flame, for example a blowtorch, is necessary, this should be carried out at least 300 mm from the closed cavity.

8.4 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 3.5.

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 be closed at the top of the wall and at the top of any opening
- domestic meter cupboards may be installed provided there are not more than two 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
- combustible materials may be placed within the cavity (England and Wales only)
- the cavity must not be more than 300 mm wide (Northern Ireland only)
- in addition to the insulation, in Northern Ireland, only the following should 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.

8.5 For constructions not covered by section 8.3, cavity barriers must be provided to comply with:

England and Wales — Approved Document B, Volume 1, Section 6, and Volume 2, Section 9

Scotland — Mandatory Standard 2.4, clauses 2.4.1[(1)(2)], 2.4.2[(1)(2)], 2.4.7[(1)] and 2.4.9[(2)]

(1) Technical Handbook (Domestic).

(2) Technical Handbook (Non-Domestic).

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

8.6 The product is combustible but may be used not more than one metre from a boundary, in walls with two leaves of masonry/concrete at least 75 mm thick, with barriers around all openings and at the top of the wall in accordance with Mandatory Standards 2.4 and 2.6, clauses 2.4.1[(1)(2)], 2.6.0[(1)(2)], 2.6.5[(1)] and 2.6.6[(2)].

(1) Technical Handbook (Domestic).

(2) Technical Handbook (Non-Domestic).

9 Maintenance

As the product is confined within the wall cavity and it has suitable durability (see section 1), maintenance is not required.

10 Durability

When correctly installed, the product is durable, rot-proof, water resistant and sufficiently stable to remain effective as an insulant for the life of the building.

Installation

11 General

11.1 The walls are constructed leading with either the inner or outer leaf. It is recommended that the inner leaf be constructed ahead of the outer leaf as this will ensure the laps are weathered to the outside.

11.2 The fixing of the product at the top of the wall will depend on the method of cavity closure, but the product can be dressed under the brick capping course.

11.3 The product can be dressed under sills but with regard to cavity trays, should be flush to the outer face, as with lintels or flanges of meter boxes and service penetrations.

12 Procedure

12.1 The leading leaf should be constructed to a height of approximately 1.2 m (five blocks) above dpc level.

12.2 The wall ties (see section 1.3) should be installed in accordance with BS 5628-3 : 2005, with special attention to eaves and openings where closer spacing of wall ties will be necessary.

12.3 The stop of the wall tie is butted against the inner leaf and this creates the minimum cavity between the product and the blockwork.

12.4 It is essential that extra care is taken by building operatives when the exposed ends of the wall ties could pose a risk of injury. Eye protection is recommended.

12.5 Once the blockwork has attained adequate strength, the initial run of product is positioned over the wall ties, ensuring that it is kept taut but with sufficient drop to below floor insulation. The product can be cut with a sharp blade to fit onto wall ties.

12.6 The top edge of the product should be a minimum of 75 mm over the top row of the wall ties giving a weathered lap joint.

12.7 When a full run is in position, the retaining clip is fixed to the wall tie to keep the product central to the cavity.

12.8 The second leaf is built up to the topmost line of the wall ties, (or two courses below) and the second run of product installed ensuring a minimum lap of 75 mm.

12.9 Vertical joints in the product should always be on a line of wall ties, ensuring a 100 mm lap (ie 50 mm either side of the wall tie).

12.10 All vertical joints are sealed using approved tape (see section 1.3).

12.11 At door and window openings the product can be butted against the cavity closer or brought through the closed reveal to act as an insulating dpc.

12.12 At internal and external corners a minimum air space of 25 mm must be maintained.

Mortar droppings

12 13 After each section of the leading leaf is built, excess mortar must be removed from the cavity face and mortar droppings cleaned from exposed coated face of the product, before the installation of the next run. Use of a cavity board or a cavity batten will protect the installed product and help keep the cavity clean as the following leaf is built.

12.14 All building involving the product, particularly work which is interrupted, must conform to BS 5628-3 : 2005, Sections A4.1.3.2, A4.1.3.9, A5.1.1.3 and A5.4.4.

Technical Investigations

14 Investigations

Tests and assessment were carried out on Airtec Double Double Bubble Cavity Wall Insulation to determine:

- emissivity
- thermal resistance.

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 EN 845-1 : 2003 *Specification for ancillary components for masonry — Ties, tension straps, hangers and brackets*

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

15 Conditions

15 .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.

15 .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.

15 .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.

15 .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.

15 .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.

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