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Agrément Certificate No 88/2130
*Third issue**

BBA BRITISH BOARD OF AGRÉMENT
TECHNICAL APPROVALS FOR CONSTRUCTION

Designated by Government to issue European Technical Approvals

KAY-CEL, KAY-CEL PLUS AND KAY-CEL SUPER PLUS 030 CAVITY WALL INSULATION

Isolant en polystyrène pour murs creux
Kerndämmung

Product

- *THIS CERTIFICATE REPLACES AND COMBINES CERTIFICATES Nos 82/1021 AND 84/1265 AND RELATES TO KAY-CEL, KAY-CEL PLUS AND KAY-CEL SUPER PLUS 030 CAVITY WALL INSULATION, AN EXPANDED POLYSTYRENE BOARD FOR CAVITY WALL INSULATION.*
- *The product is for use in buildings up to 25 metres in height, subject to the conditions contained in the* Design Data *part of this Certificate.*
- *The product is installed during construction and is for use as a partial fill board to reduce the thermal transmittance of cavity walls with masonry inner and outer leaves.*
- *It is essential that the walls are built in accordance with the conditions set out in the* Design Data *and* Installation *parts of this Certificate.*

Regulations

1 The Building Regulations 2000 (as amended) (England and Wales)

The Secretary of State has agreed with the British Board of Agrément the aspects of performance to be used by the BBA in assessing the compliance of cavity wall insulation with the Building Regulations. In the opinion of the BBA, Kay-Cel, Kay-Cel Plus and Kay-Cel Super Plus 030 Cavity Wall Insulation, if used in accordance with the provisions of this Certificate, will meet or contribute to meeting the relevant requirements.

Requirement:	B3	Internal fire spread (structure)
Comment:		Walls incorporating the product meet this Requirement provided the completed walls comply with the conditions set out in sections 8.2 to 8.4 of this Certificate.
Requirement:	C4	Resistance to weather and ground moisture
Comment:		Data obtained by the BBA indicate that a wall incorporating the product meets this Requirement, provided the completed wall complies with the conditions set out in section 7.2 of this Certificate. The product does not absorb water by capillary action and may therefore be used in situations where it bridges the dpc of the inner or outer leaf. See sections 10.1 and 10.2 of this Certificate.
Requirement:	L1	Dwellings
Requirement:	L2	Buildings other than dwellings
Comment:		The product can meet or contribute to meeting these Requirements. See sections 12.2 to 12.4 of this Certificate.

Requirement:	Regulation 7	Materials and workmanship
Comment:		The product is acceptable. See section 13 of this Certificate.

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

In the opinion of the BBA, Kay-Cel, Kay-Cel Plus and Kay-Cel Super Plus 030 Cavity Wall Insulation, if used in accordance with the provisions of this Certificate, will satisfy or contribute to satisfying the various Regulations and related Technical Standards as listed below.

Regulation:	10	Fitness of materials and workmanship
Standard:	B2.1	Selection and use of materials, fittings, and components, and workmanship
Comment:		The product can contribute to a construction meeting this Standard. See the *Installation* part of this Certificate.
Standard:	B2.2	Selection and use of materials, fittings, and components, and workmanship
Comment:		The product is an acceptable material. See section 13 of this Certificate.
Regulation:	12	Structural fire precautions
Standards:	D6.1 and D6.2	Concealed spaces — Principles
Comment:		Walls incorporating this product must satisfy these Standards. See section 8.4 of this Certificate.
Standard:	D8.2	Fire spread to adjoining buildings — Non-combustible materials
Comment:		The product is combustible but its use is not restricted by this Standard. See section 8.5 of this Certificate.
Regulation:	17	Resistance to moisture
Standard:	G2.6	Preparation of a site and resistance to moisture from the ground — Resistance to moisture from the ground
Comment:		The product does not absorb water by capillary action and may therefore be used where it bridges the dpc of the inner or outer leaf. See section 10.1 of this Certificate.
Standard:	G3.1	Resistance to precipitation — Resistance to precipitation
Comment:		Data obtained by the BBA indicate that a wall incorporating the product can satisfy this Regulation provided it complies with section 7.2 of this Certificate. See also sections 10.1 and 10.2 of this Certificate.
Regulation:	22	Conservation of fuel and power
Standard:	J3.1	Buildings in purpose group 1 — Building fabric
Standard:	J8.1	Buildings in purpose groups 2 to 7
Comment:		The product can satisfy or contribute to satisfying these Standards. See sections 12.2 to 12.4 of this Certificate.

3 The Building Regulations (Northern Ireland) 2000

In the opinion of the BBA, Kay-Cel, Kay-Cel Plus and Kay-Cel Super Plus 030 Cavity Wall Insulation, if used in accordance with the provisions of this Certificate, will satisfy or contribute to satisfying the various Building Regulations as listed below.

Regulation:	B2	Fitness of materials and workmanship
Comment:		The product is acceptable. See section 13 of this Certificate.
Regulation:	C4	Resistance to ground moisture and weather
Comment:		Data obtained by the BBA indicate that a wall incorporating the product can satisfy this Regulation provided it complies with section 7.2 of this Certificate. See also sections 10.1 and 10.2. The product does not absorb water by capillary action and may therefore be used where it bridges the dpc of the inner or outer leaf. See section 10.1 of this Certificate.
Regulation:	E4	Internal fire spread — Structure
Comment:		Walls incorporating the product can satisfy this Regulation. See sections 8.2 to 8.4 of this Certificate.
Regulation:	F2	Building fabric
Comment:		The product can satisfy this Regulation. See sections 12.2 to 12.4 of this Certificate.

4 Construction (Design and Management) Regulations 1994 (as amended) Construction (Design and Management) Regulations (Northern Ireland) 1995 (as amended)

Information in this Certificate may assist the client, planning supervisor, designer and contractors to address their obligations under these Regulations.

See section:	6 *Delivery and site handling* (6.3).

Technical Specification

5 Description

5.1 Kay-Cel, Kay-Cel Plus and Kay-Cel Super Plus 030 Cavity Wall Insulation are boards manufactured from expanded polystyrene beads(1).

5.2 The boards are manufactured in standard sizes(2) of 1200 mm by 400 mm and 1200 mm by 450 mm, and in thicknesses (mm) of:

25, 30, 38, 40, 50, 60, 65, 75 and 100.

(1) Kay-Cel Super Plus 030 is produced from grey polystyrene bead.

(2) For special situations outside the scope of this Certificate, boards of the appropriate dimensions are available on request.

5.3 Only those insulation retaining fixings approved by the BBA should be used with this system. Names and addresses of suppliers of approved fixings are available from the Certificate holder and the BBA.

5.4 It should be noted that while approved ties are suitable for use for insulation retaining purposes, additional vertical twist ties to BS 1243 : 1978 or designed in accordance with BS DD 140-2 : 1987 may be required for structural stability in accordance with BS 5628-3 : 2001, where the overall cavity width exceeds 75 mm.

6 Delivery and site handling

6.1 The boards are delivered to site in packs wrapped in polythene. Each pack contains a label with the manufacturer's trade name and the BBA identification mark incorporating the number of this Certificate.

6.2 The product must be protected from prolonged exposure to sunlight and should be stored either under cover or protected with opaque polythene.

6.3 The boards must not be exposed to open flame or other ignition sources. Care must be taken to avoid contact with solvents and with materials containing volatile organic components such as coal tar, pitch, or timber newly treated with creosote.

Design Data

7 General

7.1 Kay-Cel, Kay-Cel Plus and Kay-Cel Super Plus 030 Cavity Wall Insulation boards are 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 precautions given in this Certificate to prevent moisture penetration.

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

- BS 5628-3 : 2001. In particular, Clause 5.5.2 of the Code of Practice *Rain penetration* 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, and
- BS 8000-3 : 2001.

7.3 Other buildings not subject to these Regulations should also be built in accordance with the Standards given in section 7.2.

7.4 As with all cavity wall insulation the construction detailing should comply with good practice as described in the BBA joint publication Cavity Insulation of *Masonry Walls — Dampness Risks and How to Minimise Them*. They are particularly important in areas subject to severe rain.

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

7.6 As with any other form of cavity wall insulation, where buildings need to comply with NHBC Standards or Zurich Building Guarantees Technical Standards, specifiers should observe the requirements of these Standards.

Buildings up to and including 12 metres high

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

7.8 Where a residual cavity width of 50 mm or greater is maintained the boards can be used in any exposure zone. However, the use of the system does not preclude the need to apply any external render coat or other suitable finish in severe exposure zones where such application would be normal practice.

7.9 The minimum residual cavity width to be maintained during construction must be 25 mm. To achieve this requirement a greater nominal residual cavity width may need to be specified at the design stage to allow for inaccuracies inherent in the building process. The specifier may either:

- design a cavity width by consideration of the dimensional tolerances of the components which make up the wall by reference to the British Standards relating to the bricks, blocks and boards or use the data from their respective manufacturers. In addition allowance may need to be made for the quality of available building operatives and the degree of site supervision or control available, or

- design a nominal residual cavity width of 50 mm (a residual cavity nominally 50 mm wide will be required by the NHBC Standards and Zurich Building Guarantees Technical Standards, where normal standards of tolerance and workmanship are adopted).

7.10 The size of residual cavity obtained in the processes described in section 7.9 is also subject to the following limitations in respect of exposure of the proposed building as set out in Table 1.

Table 1 Maximum allowable total exposure factor of different constructions

Construction	Maximum allowable exposure factor E[1]
All external masonry walls protected by: rendering (to BS 5262 : 1991), tile hanging, slate hanging, timber, plastic or metal weatherboarding or cladding	no restriction
One or more external masonry walls constructed from facing clay brickwork or natural stone, the porosity of which exceeds 20% by volume. Mortar joints must be flush pointed or weatherstruck.	100
One or more external masonry walls constructed from calcium silicate bricks, concrete blocks, reconstituted stone, or natural stone the porosity of which is less than 20% by volume, or any material with raked mortar joints.	88

(1) Based upon the approach in BS 5618 : 1981

Buildings over 12 metres high and up to and including 25 metres high

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

- from ground level the maximum height of continuous cavity walls must not exceed 12 metres; above 12 metres the maximum height of continuous cavity wall must not exceed 7 metres. In both cases breaks should be in the form of continuous horizontal cavity trays discharging to the outside
- the specifier must take extra care when detailing to ensure that the introduction of the insulation does not affect the weather resistance of the wall. More than average site supervision is recommended during the installation of the product
- the exposure factor or index must not exceed 120
- where, for structural reasons, the cavity width is reduced, eg, by the intrusion of ring beams, a minimum residual cavity width of 25 mm must be maintained and extra care must be taken with fixings and weatherproofing, eg inclusion of a cavity tray.

8 Behaviour in relation to fire

8.1 Use of the boards does not prejudice the fire resistance properties of the wall. They are unlikely to become ignited within the cavity when used in the context of this Certificate. If fire does penetrate into an unventilated cavity, the amount of air present will be insufficient to support combustion, and flame spread will be minimal.

8.2 The requirements of the Building Regulations relating to fire spread in cavity walls, can be met in buildings of all purpose groups without the need for cavity barriers, provided the construction complies with the provisions detailed in:

England and Wales

Approved Document B, Diagram 32

Northern Ireland

Technical Booklet E, Diagram 3.5.

8.3 A summary of these provisions is given here:

England and Wales, and Northern Ireland

(1) The wall must consist of masonry inner and outer leaves, each at least 75 mm thick.

(2) The cavity must not be more than 100 mm wide (in Northern Ireland only).

(3) The cavity must be closed at the top of the wall and at the top of any opening.

(4) In addition to the insulation only the following 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 pening in the outer leaf is not more than 800 mm by 500 mm for each cupboard, and the inner leaf is not penetrated except by a sleeve not more than 80 mm by 80 mm, which is fire-stopped.

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

England and Wales

Approved Document B, Section 10

Scotland

Technical Standards D6.1 and D6.2

Northern Ireland

Technical Booklet E, paragraphs 3.27 to 3.30.

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

9 Proximity of flues and appliances

When installing the product in close proximity to certain flue pipes and/or heat producing appliances, the following provisions to the national Building Regulations are acceptable:

England and Wales

Approved Document J

Scotland

Technical Standards, Part 1. *Provisions deemed to satisfy the Technical Standards*

Northern Ireland

Technical Booklet I.

10 Liquid water penetration

10.1 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 C, Section 4

Scotland

Technical Standard G2.6

Northern Ireland

Technical Booklet C, Section 1.6.

10.2 Constructions incorporating the products and built in accordance with BS 5628-3 : 2001 and section 7 of this Certificate will resist the transfer of precipitation to the inner leaf and satisfy the national Building Regulations:

England and Wales

Requirement C4

Scotland

Technical Standard G3.1

Northern Ireland

Regulation C4.

10.3 In all situations it is particularly important to ensure during 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
- mortar droppings are cleaned from the exposed edges of installed boards
- boards are properly installed with weathered lap
- installation is carried out to the highest level on each wall or the top edge of the insulation is protected by a cavity tray
- at lintel level, a cavity tray, stopends and weepholes, must be provided.

11 Water vapour penetration

11.1 The Kay-Cel board has a vapour resistivity in excess of 145 $MNsg^{-1}m^{-1}$ and therefore, will provide a significant resistance to the passage of water vapour, and would be considered a vapour control layer as defined in Section 1 of BS 5250 : 2002. Joints between boards will facilitate the passage of water vapour under normal conditions of temperature and humidity.

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

12 Thermal insulation

12.1 For the purpose of U value calculations to determine if the requirements of the Building (or other statutory) Regulations are met, the thermal conductivity (λ value in $Wm^{-1}K^{-1}$) of the boards may be taken as:

Kay-Cel	0.038
Kay-Cel Plus	0.033
Kay-Cel Super Plus 030	0.030

12.2 The requirement for limiting the heat loss through the building fabric can be satisfied if the U value of the building elements, including thermal bridging, do not exceed the maximum value in the relevant Elemental Approach given in the national Building Regulations:

England and Wales

Approved Documents L1 and L2, Table 1

Scotland

Technical Standards J3.2, Table 1, and J8.3, Table

Northern Ireland

Technical Booklet F, Table 1.2 and 1.4.

12.3 Guidance is also given in these documents on selecting the thickness of insulation required to enable a wall to achieve the desired U value. Alternative approaches are also described which allow for some flexibility in design of U values for individual construction and elements.

12.4 Care should be taken to ensure that the design allows for limiting excessive additional heat loss and risk of surface condensation at openings within the boards and at junctions between the boards and other building elements. Reference can be made to *Limiting thermal bridging and air leakage : Robust construction details for dwellings and similar buildings* : 2002 or BR262 : 2002 *Thermal insulation : avoiding risks*.

13 Durability

The boards are dimensionally stable, rot-proof and durable, and will remain effective as an insulation system for the life of the building.

14 General

It is recommended that the inner leaf be constructed ahead of the outer leaf, as Kay-Cel, Kay-Cel Plus and Kay-Cel Super Plus 030 Cavity Wall Insulation boards are fastened to the cavity face of the inner leaf, giving a slightly enhanced thermal performance.

15 Procedure

15.1 A section of the leading leaf is built with the first row of wall ties, at approximately 600 mm horizontal spacing, where the insulation is to begin. The first run of boards may commence below damp-proof course level to provide some edge insulation for the floor (see Figure 1).

15.2 The leading leaf is built up to the required height with wall ties placed at a vertical height of 450 mm. Excess mortar is cleaned from the cavity face of the leading leaf, and the boards are placed on the wall ties behind the retaining clips, to form a closely butt-jointed run. It is essential that all wall ties slope downwards towards the outer leaf (see Figure 2).

15.3 Horizontal spacing should be:

- where insulation retaining ties/clips are sufficient for structural purposes, allow 450 mm or 600 mm, depending on the thickness of the thinner leaf. Although a maximum horizontal spacing of 900 mm is permitted for structural purposes by BS 5628-3 : 2001, for the purpose of adequately retaining the boards, this should be no more than 600 mm
- where vertical twist ties are required, in accordance with BS 5628-3 : 2001 and if they do not have insulation retaining clips, additional insulation retaining ties and clips should be installed, spaced at 600 mm centres to give adequate retention of the boards.

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

Mortar droppings

15.5 After each section of the leading leaf is built, excess mortar should be removed from the cavity face and mortar droppings cleaned from exposed edges of the installed board, before installation of the next run of the boards. Use of a cavity board is recommended to protect board edges and make cleaning easier. Also, a cavity batten will protect the installed boards and help to keep the cavity clean as the following leaf is built (see Figures 3 and 4).

Figure 1 First run of boards

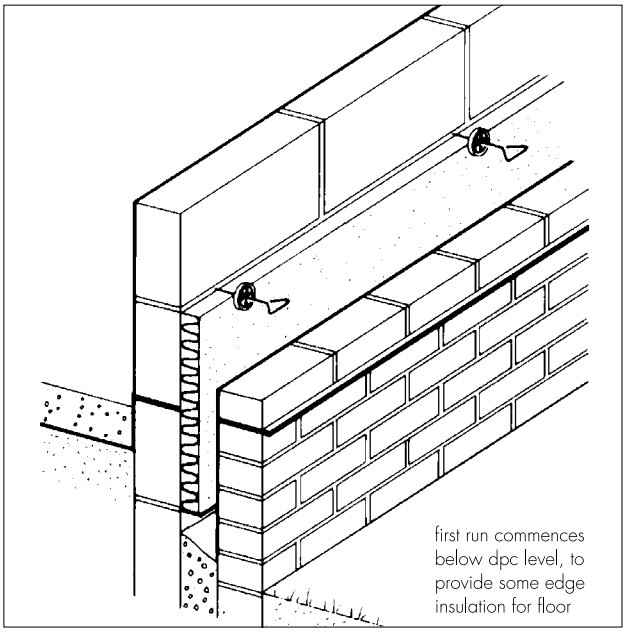


Figure 2 Wall tie detail

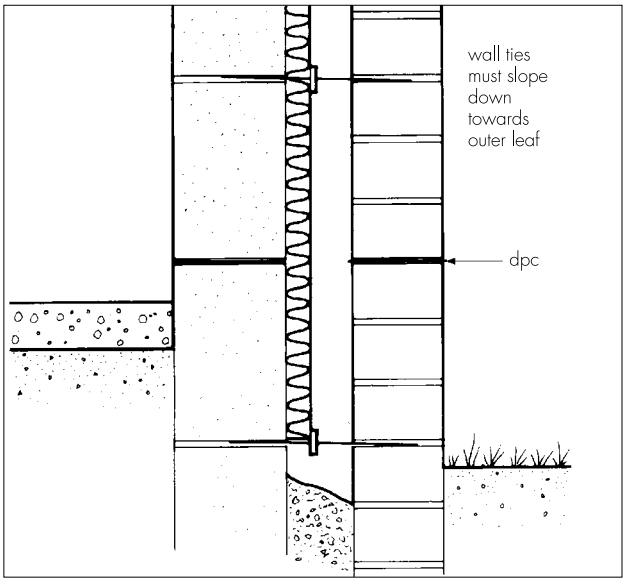


Figure 3 Use of cavity board

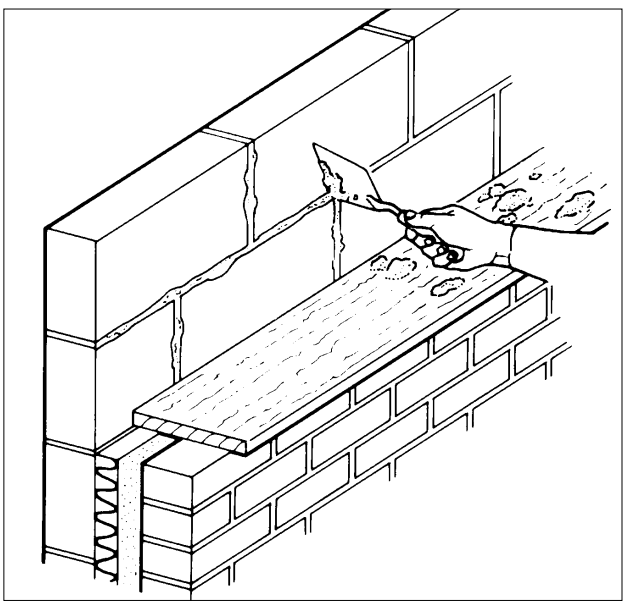
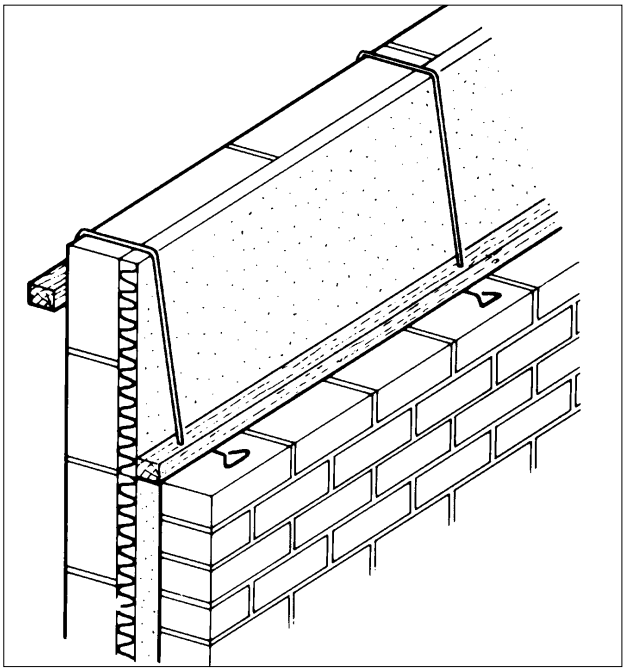


Figure 4 Use of cavity batten



Cut pieces

15.6 The boards can be cut, using a sharp knife or fine-toothed saw, to fit around windows, doors, air bricks. It is essential that cut pieces completely fill the spaces for which they are intended and that no gaps are left in the insulation.

Protection

15.7 All building involving the slabs, particularly work which is interrupted, must conform to BS 5628-3 : 2001, Annex A4.1.31 *Handling and site storage*, Annex A5.1.1 *Weather conditions*, and Annex A5.4.4 *Installing insulation*.

Technical Investigations

The following is a summary of the technical investigations carried out on Kay-Cel, Kay-Cel Plus and Kay-Cel Super Plus 030 Cavity Wall Insulation.

16 Tests

As part of the assessment resulting in the issue of the previous Certificates, tests were carried out to determine:

- density of the boards
- dimensional accuracy
- suitability of fixing methods.

17 Investigations

17.1 A re-examination was made of the data on which both Certificates Nos 82/1021 and 84/1265 were based.

17.2 An examination was made of data relating to Kay-Cel, Kay-Cel Plus and Kay-Cel Super Plus 030 Cavity Wall Insulation.

Additional Information

The management systems of Kay Metzeler Limited have been assessed and registered as meeting the requirements of BS EN ISO 9002 : 1994 by the British Standards Institution Quality Assurance (Certificate No 10541).

Bibliography

BS 1243 : 1978 *Specification for metal ties for cavity wall construction*

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

BS 5262 : 1991 *Code of practice for external renderings*

BS 5618 : 1985 *Code of practice for thermal insulation of cavity walls (with masonry or concrete inner and outer leaves) by filling with urea-formaldehyde (UF) foam systems*

BS 5628-3 : 2001 *Code of practice for use of masonry — Materials and components, design and workmanship*

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

BS DD 140-2 : 1987 *Wall ties — Recommendations for design of wall ties*

BS EN ISO 9002 : 1994 *Quality systems — Model for quality assurance in production, installation and servicing*

Conditions of Certification

18 Conditions

18.1 This Certificate:

(a) relates only to the product that is described, installed, used and maintained as set out in this Certificate;

(b) is granted only to the company, firm or person identified on the front cover — no other company, firm or person may hold or claim any entitlement to this Certificate;

(c) is valid only within the UK;

(d) has to be read, considered and used as a whole document — it may be misleading and will be incomplete to be selective;

(e) is copyright of the BBA;

(f) is subject to English law.

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

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

(a) are maintained at or above the levels which have been assessed and found to be satisfactory by the BBA;

(b) continue to be checked as and when deemed appropriate by the BBA under arrangements that it will determine; and

(c) are reviewed by the BBA as and when it considers appropriate.

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

(a) the presence or absence of any patent or similar rights subsisting in the product or any other product;

(b) the right of the Certificate holder to market, supply, install or maintain the product; and

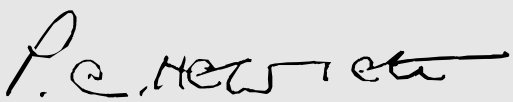
(c) the nature or standard of individual installations of the product or any maintenance thereto, including methods and workmanship.

18.5 Any recommendations relating to the use or installation of this product which are contained or referred to in this Certificate are the minimum standards required to be met when the product is used. They do not purport in any way to restate the requirements of the Health & Safety at Work etc Act 1974, or of any other statutory, common law or other duty which may exist at the date of this Certificate or in the future; nor is conformity with such recommendations to be taken as satisfying the requirements of the 1974 Act or of any present or future statutory, 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 installation and use of this product.

BBA BRITISH BOARD OF AGRÉMENT
TECHNICAL APPROVALS FOR CONSTRUCTION

In the opinion of the British Board of Agrément, Kay-Cel, Kay-Cel Plus and Kay-Cel Super Plus 030 Cavity Wall Insulation is fit for its intended use provided it is installed, used and maintained as set out in this Certificate. Certificate No 88/2130 is accordingly awarded to Kay Metzeler Limited.

On behalf of the British Board of Agrément



Date of Third issue: 30th April 2004

Chief Executive

**Original Certificate issued 14th March 1989. This amended version includes change of product name, additional product range, reference to revised national Building Regulations, addition of reference to CDM Regulations, and new* Conditions of Certification.

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