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CERTIFICATE OF ASSESSMENT

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PRODUCT

THERMA-CLOSE

SUPPLIED BY

Yorkshire Building Services (Whitwell) Limited
Units 5/6/7, Creswell Industrial Estate
Creswell, Derbyshire, S80 4BU
Tel: 01909 721662
Fax: 01909 721442

SUMMARY

Therma-Close has been assessed to confirm its suitability for use as a cavity closure to provide a damp-proof barrier and thermal insulation, around openings for windows or doorsets in masonry external cavity walls. Therma-Close is a composite comprised of extruded polystyrene foam to BS 3837:Part 2, bonded to a polyethylene damp-proof course to BS 6515, or PVC-U extrusion profiles and fitted with plastics positioning clips.

Characteristics of the cavity closures have been reviewed with respect to the Building Regulations current in the United Kingdom. The assessment has referred to British Standards current in December 1998.

The assessment is described in the following pages, which form integral parts of this certificate.

LIMITATIONS OF USE

Therma-Close cavity closure is certified for use as a damp-proof barrier and thermal insulation for installation around masonry external cavity wall opening provisions, including checked/rebated reveals. The load imposed on and by the completed joinery element must be transferred directly to the structure. The cavity closure must be continuously supported and, either mechanically fixed onto the side of the joinery frame with pins prior to the raising of the masonry, or fitted into the masonry wall cavity at the point of closure. The external wall cavity must be between 50 mm and 100 mm wide. The product has not been assessed for use unsupported across a wall cavity, in situations where they would be stepped, or for contributing to the structural or sound insulation performance.

Therma-Close must be installed strictly in accordance with the requirements of this certificate and the manufacturer's instructions as inspected by WIMLAS Limited. The manufacturer must continue to provide a technical consultancy service.

STATEMENT

It is the opinion of WIMLAS Limited that Therma-Close is satisfactory for use within the stated limitations provided it is used in accordance with the manufacturer's instructions and the requirements of this certificate.

CONFIRMATION

For and on behalf of
WIMLAS Limited

P D Johnson Manager

R D Jones Director

1. TECHNICAL SPECIFICATION

1.1 Description of Product

1.1.1 Therma-Close cavity closures are available in two formats to suit different window frame, door frame and window positions.

1.1.2 Standard Therma-Close cavity closures are assembled from, Grade E1 extruded polystyrene foam to BS 3837:Part 2, of 38 mm thickness and of 50 mm, 65 mm, 75 mm, 85 mm or 100 mm width, as appropriate, to suit the cavity width. One 38 mm thick face of the foam is bonded centrally along one face of a 112.5 mm wide polyethylene damp-proof course to BS 6515. T-profile plastics positioning clips 50 mm by 38 mm by 30 mm, are adhered along one edge of the opposing 38 mm thick face of the foam at 300 mm centres. The resultant closures are available in 2.50 m prefabricated lengths of the composite. Other non-standard width and insulation thickness formats are available to order.

1.1.3 Therma-Close Type R cavity closures are assembled with continuous rigid and flexible PVC-U extrusions and co-extrusions, in place of the polyethylene damp proof course and T-profile clips, bonded to the faces of the foam insulation.

1.1.4 YBS tie clips are available for the Therma-Close Type R for securing the closure to the masonry. The clips can be secured with pins into the insulation or directly into the rigid PVC-U extrusions.

1.2 Product Performance

1.2.1 Therma-Close cavity closures are intended to provide a method to enhance the thermal insulation of new-build masonry external cavity walls, at window and doorset thresholds, jambs, sills and other positions where the cavity is closed. The closures avert cold bridging, by reducing local potential paths of high heat loss. The closures provide a damp-proof barrier at the point of closure between the inner and outer wall leaves. The use of the closures obviates the necessity for reveal blocks, or for the cutting of masonry units, to enable the returning of the masonry leaves to provide closure of the cavity at the opening provision reveals. The closures can accommodate checked/rebated reveals, the detail typical in Scotland, Northern Ireland and areas of very severe exposure rating, with the outer leaf masking the edge of the window jamb. The closures suit a cavity of between 50 mm and 100 mm width, and may be used to control the cavity width as the wall is raised. They require no maintenance when correctly installed.

1.2.2 Walls incorporating the closures can be constructed to give a thermal resistance of at least 1.85 m²K/W interposed at the point of closure between the inner and outer wall leaves at the edges of openings, depending on the width of the cavity, on the structure and dimensions of the wall and on the particular application. The thermal transmittance may be calculated in accordance with CIBSE Guide:Part A3:1986 "Thermal properties of building structures", or with Approved Document L (1995) supporting the Building Regulations (England and Wales) 1991, Scottish Technical Standards Appendix B to Part J or with BRE Information Paper IP 12/94 "Assessing condensation risk and heat loss at thermal bridges around openings". Calculations, undertaken following the procedures outlined in the latter document, have shown that Rmin will be no less than 0.1 m²K/W and Rmod will be no less than 0.45 m²K/W, when examined as installed in a typical masonry construction.

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1.2.3 The closures are considered suitable for use as insulation at the point of closure at the edges of openings of new build external masonry cavity walls, provided that loadings do not exceed the levels given immediately below. In particular the lintel must not bear directly on to the closures. Tests have shown that the closures have adequate strength to resist distributed loads of up to 4 kN/m² without excessive deflection or permanent deformation.

1.2.4 When installed in accordance with this certificate and the appropriate Clauses of BS 5250, the closures will not promote surface or interstitial condensation. Condensation is considered to be unlikely to occur with the constructions specified in this certificate. However, condensation risk calculations should be undertaken to ensure that it will not occur for the intended application.

The closures can prevent the passage of water from external sources and may be considered as providing water vapour resistance to a degree equivalent to that of a damp-proof barrier.

1.2.5 The closures will not impair the fire resistance performance of the wall. The closures must not be regarded as being a cavity barrier against the penetration of fire and smoke within the context of the Building Regulations. However, they are not required so to be for use within an external masonry cavity wall meeting the requirements of this certificate, provided that the cavity, if not totally filled with insulation, is sealed at the top, that either leaf is at least 75 mm thick, and that the top of the opening provision is closed with a component that can act as a cavity barrier.

Since the closures are not considered to be non-combustible, they must be adequately separated from: heat-producing appliances, incinerators, hearths, fire backs, ash pit surrounds, ductwork for high temperature gases, flues, chimneys and fire places or recesses (see Section 2 below).

1.2.6 The closures should remain effective for the design life of the assemblies for which they are specified, where the closures remain protected within the external wall cavity, provided they are installed in accordance with the manufacturer's instructions and the requirements of this certificate.

2. BUILDING REGULATIONS

The relevant Building Regulations requirements for the product are:-

2.1 **The Building Regulations (England and Wales) 1991 (as amended**)

Requirement

B3(4) Internal fire spread (structure) - combustible materials are permitted in a masonry external cavity wall by these Regulations.

C4 Resistance to weather and ground moisture - the cavity closures can adequately resist the passage of moisture to the underlying structure, provided the wall is constructed in accordance with BS 5628:Part 3 and the requirements of this certificate. Advice is given in Section 3.3 below and in Section 4 of Approved Document C supporting these Regulations.

J3 Protection of the building from heat-producing appliances - in order to comply with this Regulation the cavity closures must be adequately separated or shielded from a

chimney, flue, fireplace recess, heat-producing appliance or hearth. The separations recommended, where appropriate, are detailed in Approved Document J supporting these Regulations, to which reference must be made.

L1 Conservation of fuel and power - the edges of an opening in a wall, formed using the cavity closures, can be designed and constructed to provide an adequate thermal resistance and no undue condensation risk, interposed at the point of closure between the inner and outer external wall leaves, as calculated in accordance with BRE Information Paper IP 12/94. Reference should be made to Table D3 of Approved Document L supporting these Regulations.

Regulation

7 Materials and workmanship - Therma-Close closures are manufactured from suitably safe and durable materials for their application and can be installed to give a satisfactory performance.

2.2 **The Building Standards (Scotland) Regulations 1990 (as amended**)

Regulation

B2.1 Selection and use of materials and components - Therma-Close closures are manufactured from acceptable materials and are considered to be adequately resistant to deterioration and wear under normal service conditions, provided they are installed in accordance with the requirements of this certificate.

D4.1 Cavity barriers - combustible materials are permitted in a masonry external cavity wall by these Standards, but they require the opening provision to be sealed all around.

F2 Heat-producing, solid fuel burning or oil- or gas-fired installations - a wall, incorporating the cavity closures, can be designed and constructed to comply with these Standards, provided that they are isolated from the flue of a gas-fired, or solid fuel, or oil-fired heat-producing appliance by a separation. They must be adequately separated from a fire place opening, recess, hearth or flue pipe, or from any heat-producing appliance.

G3.1 Resistance to precipitation - the cavity closures are resistant to the passage of water, but they must be continuous with any adjacent damp-proof membrane. Advice is given in Section 3.3 below.

G4 Condensation - the edges of openings in a wall, formed using the cavity closures in accordance with the requirements of this certificate and of BS 5250, can be designed and constructed to comply with these Standards.

J2.1 Conservation of fuel and power: the building fabric - details, incorporating the cavity closurers interposed at the point of closure between the inner and outer external wall leaves, can be designed and constructed to provide a U-value of less than 1.2 W/m²K. Reference should be made to Appendix B of this Standard

2.3 **The Building Regulations (Northern Ireland) 1994 (as amended)**

Regulation

B2 Fitness of materials and workmanship - Therma-Close cavity closures are manufactured from materials which are considered to be suitably safe and acceptable for use as cavity closures for an external wall.

C5 Resistance to ground moisture and weather - where the cavity closures are installed within an external cavity wall, it can be so designed and constructed as to prevent the passage of moisture or water vapour through the wall. Advice is given in Section 3.3 below.

C7 Condensation - the edges of openings in a wall, built using the cavity closures in accordance with the requirements of this certificate and BS 5250, can be designed and constructed to prevent any harmful effect from moisture in the form of interstitial condensation.

E6 Internal fire spread: structure - combustible frame materials are permitted in a masonry external cavity wall.

F2 Conservation of fuel and power - details, incorporating the cavity closures interposed at the point of closure between the inner and outer external wall leaves, can be designed and constructed to provide a U-value of no more than 1.2 W/m²K.

L2 Heat-producing appliances and associated constructions - a wall, incorporating the cavity closures can be designed and constructed to comply with these Regulations, provided that they are isolated from the flue of a gas-fired, or solid fuel or oil-fired heat-producing appliance or an incinerator. They must be adequately separated from a chimney or fireplace recess, from a flue pipe, from a hearth or from the appliance.

3. INSTALLATION/PRACTICAL APPLICATION

3.1 Identification

Therma-Close cavity closures are delivered to site in cardboard boxes containing 16 - 24 lengths per box dependent on cavity width of individual prefabricated lengths of the composite. Each box is supplied with a label marked Therma-Close, the date of manufacture, dimensions, the number of closures in the box, the identity code of the packer and an instruction leaflet.

3.2 Storage and Handling

The boxes of prefabricated cavity closures must be stored on a firm, level and dry base, stacked near to horizontal, away from excessive heat, no more than ten high and be fully supported so that they do not distort by twisting or bowing.

For additional weather protection, black polyethylene sheeting or similar opaque material should be used if the cavity closures are to be stored outside for a period of seven days or more.

The cavity closures are easily handled on site and they may be readily cut or trimmed with a fine toothed saw, knife or trowel, should this be necessary; it should be noted that operatives should not be exposed to more than 10 mg/m³ 8 hours TWA (Occupational Exposure Limit for total respirable dust). Reasonable precautions should be taken to prevent damage to the closures before, during or subsequent to installation. In particular, they should not be exposed to an open flame, or other ignition sources; the advice presented in BS 6203 should be followed. They must be handled with care and be secured if outside in windy conditions. They must not be punctured, split, deformed or unduly impacted before use. They must not be directly exposed to any plastics material incorporating plasticizers, or to volatile organic solvents.

3.3 Installation

3.3.1 Therma-Close cavity closures must be installed in accordance with the relevant requirements of the manufacturer's installation instructions. The handling and installation instructions have been inspected during the assessment. In the opinion of WIMLAS they provide satisfactory guidance for users of the product.

3.3.2 Therma-Close cavity closures must be either friction fitted into the cavity of the external wall at the point of closure, at a sill, threshold or installed into the cavity as it is raised, or the closures must be tacked on to the side of the joinery item, and the inner masonry leaf subsequently raised up against them. Therma-Close Type 2 cavity closures fitted as the wall is raised may be fixed with YBS tie clips secured into the rigid PVC-U extrusions at not greater than 300 mm centres, or tacked to the inner leaf. The damp-proof course must be positioned so that it faces towards the outer leaf, laps the masonry cavity along one edge and, along the other, either laps the adjacent joinery frame or is trapped between it and the external masonry leaf. The closures must be square and plumb and tight with either leaf, but the leaves must not exert pressure that they distort the closures. The completed cavity surface of any cavity wall, within which the cavity closures are to be installed, must be adequately smooth, flat and true in accordance with the appropriate Clauses of BS 5628:Part 3. The deviation in plane should be not greater than 5 mm under a 3 m straight edge, and the wall must be constructed in accordance with BS 5628:Part 3 and BS 8000:Part 3.

3.3.3 Lapped joints in the Standard Therma-Close cavity closure must incorporate a minimum 100 mm overlap of damp-proof course material. Where the closures are to be used vertically and horizontally the bottom 100 mm of the insulation should be trimmed from the vertical closure prior to installation, to enable the damp-proof course of the vertical closure to overlap to the outside of the horizontal where they are to be butted up together. Joints in the Therma-Close Type R closures should be mitred at 45°, sloped towards the outer leaf and tightly butted, so that there are no visible gaps that could lead to thermal bridging. Care must be taken to ensure that the cavity closures are not damaged by subsequent operations. The closures must not be bridged by mortar droppings or the like. Mortar must be removed before it has had time to harden.

3.3.4 The closures must be continuous with any adjacent wall damp-proof course; the linking must be able to accommodate any anticipated differential movement. Thermal bridging should be minimised at external wall junctions, but must not bridge any adjacent damp-proof course. This must all be in accordance with the relevant Clauses of BS 5250, BS 8000:Part 4, and BS 8215. Reference must also be made to BRE document BR 262 (1994) "Thermal insulation - avoiding risks".

3.3.5 The work should be so programmed that the cavity closures are left exposed for the minimum time.

3.3.6 The cavity closures must not be in direct contact with hot pipes or exposed to continuous working temperatures in excess of 75°C. The cavity closures must be separated from any subsequent hot applied materials, such as asphalt, by a timber batten, or similar, barrier.

3.3.7 Where it is intended to make the external perimeter joint between the outer masonry leaf and the completed window or doorset weathertight, this must be achieved by sealing it with a proprietary neutral curing silicone sealant, of Type A to BS 5889, backed, if the joint gap is open at the back, with a polyethylene foam backing rod, or a PVC flexible foam tape. The instructions of the sealant manufacturer must be followed, in particular regarding the necessity for any prior cleaning of the surfaces or for the use of a suitable primer. In Scotland, Northern Ireland and areas of very severe exposure, where checked reveals are typically used, these joints must be sealed.

3.3.8 The internal reveal must be dry lined on adhesive dabs to mask the insulation clip or internal leaf extrusion, and not plastered.

3.3.9 No maintenance of the cavity closures is necessary provided that they remain installed strictly in accordance with the requirements of this certificate and of the manufacturer.

4. TECHNICAL APPRAISAL

4.1 Performance Tests

Assessment and site inspections have been effected of the procedures and practicality of installation in Britain. Buildings recently insulated with the cavity closures have been inspected. Tests and investigations have been undertaken to determine the properties of Therma-Close including:-

- dimensional tolerances
- thermal properties
- resistance to water vapour
- condensation risk.

4.2 Quality Control

The manufacturer carries out quality control tests and inspections at regular intervals, including checks on appearance and dimensions, to ensure that the quality of Therma-Close is maintained within the product specification. Quality records are maintained on file by the manufacturer.

In the opinion of WIMLAS the specification of the materials used and the quality control procedures of the manufacturer are suitable for the product.

TABLE 1: Properties of Therma-Close

Property		Result
Thermal conductivity of insulation	BS 874	0.027 W/mK
Water vapour resistance		300 MNs/g
Peel strength of composite	BS 5350 Part C12	12N
Dimensional tolerances of product		± 1 mm

4.3 British Standards and other Documentation

The following British Standards have been referred to for this assessment:-

BS 874:Part 2:Section 2.1:1986 Methods of determining thermal insulating properties: tests for thermal conductivity and related properties: guarded hot-plate method.

BS 2782: Methods of testing plastics.

BS 3837:Part 2:1990 Expanded polystyrene board: Specification for extruded boards.

BS 4370: Methods of test for rigid cellular materials:

BS 5250:1989 Code of practice for control of condensation in buildings.

BS 5628:Part 3:1985 Code of practice for the use of masonry: Materials and components, design and workmanship.

BS 5889:1989 Specification for one-part gun grade silicone-based sealants.

BS 6399:Part 1:1984 Loadings for buildings: Code of practice for dead and imposed loads.

BS 6515:1984 Specification for polythene damp-proof courses for masonry.

BS 8000:Part 3:1989 Workmanship on building sites: code of practice for masonry.

:Part 4:1989 : code of practice for waterproofing.

:Part 5:1990 : code of practice for carpentry, joinery and general fixings.

BS 8215:1991 Code of practice for design and installation of damp-proof courses in masonry construction.

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

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5. CONDITIONS OF CERTIFICATE ISSUE

5.1 Validity

This certificate will be valid for a period of five years. It will remain valid in so far as:

a) The materials and methods of manufacture are unchanged.

b) The designs and specifications are unaltered from those examined by WIMLAS.

c) Yorkshire Building Services (Whitwell) Limited continues to have the product checked by WIMLAS.

5.2 Health and Safety

This certificate and the recommendations herein do not purport in any way to restate the requirements of the Health and Safety at Work Act 1974 or any statutory or common law duty of care which exists now or in future; nor is compliance with these recommendations to be assumed as satisfying the requirements of the said Act or any existing or future statutory or common law duty of care.

5.3 Reference to other Documentation

Where reference is made in this certificate to any Act of Parliament, Regulation, Code of Practice, British or other Standard or other publications, it shall be construed as reference to such publication in the form in which it is in force at the date of the certificate.

5.4 Patents

WIMLAS makes no representational warranty that any patent or similar industrial property right is valid or that the manufacture, use, sale, lease or any other dealing or disposition of the products in whole or in part is not an infringement of any patent or industrial property right not owned by Yorkshire Building Services (Whitwell) Limited.