

Designated by Government
to issue
European Technical
Approvals

RIGID-COR F/HYCOR SYSTEM 3000 F CAVITY CLOSER

Patron
Chablone

Product




- THIS CERTIFICATE RELATES TO THE RIGID-COR F/HYCOR SYSTEM 3000 F CAVITY CLOSER, A MINERAL WOOL INSULATED PVC-U CAVITY CLOSER AND CAVITY BARRIER FOR USE IN MASONRY CAVITY WALLS WITH CAVITY WIDTHS OF 50 mm, 75 mm AND 100 mm.

- The product closes the cavity at openings without forming a thermal bridge and provides a damp-proof barrier between inner and outer wall leaves at the point of closure and can be used to establish the cavity width and to form an opening. The product is suitable for use with timber or PVC-U window and door frames.

continued

Regulations

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

 The Secretary of State has agreed with the British Board of Agrément the requirements of the Building Regulations to which cavity closers and sub-frame fixing profiles can contribute in achieving compliance. In the opinion of the BBA, the Rigid-Cor F/Hycor System 3000 F Cavity Closer, if used in accordance with the provisions of this Certificate, will meet or contribute to meeting the relevant requirements.

Requirement: C4	Resistance to weather and ground moisture
Comment:	The product prevents the passage of moisture from the outer leaf to the inner leaf of a cavity wall at window or door openings. See sections 11.1 to 11.3 of this Certificate.
Requirement: L1	Dwellings
Requirement: L2	Buildings other than dwellings
Comment:	When the product is used as detailed in this Certificate, adequate provision will have been made to limit the thermal bridging which occurs around the opening of which it forms a part. The detail will therefore contribute to meeting the requirement of limiting the heat loss through the fabric of the building and the risk of surface condensation on the reveal will be minimal. See section 10.1 of this Certificate.
Requirement: Regulation 7	Materials and workmanship
Comment:	The product is acceptable. See section 14 of this Certificate.

continued

- The product acts as a cavity barrier at the opening, providing a minimum 30 minutes fire resistance, with respect to both integrity and insulation.
- The closers are non-loadbearing and window and door frames must be fixed independently to the masonry. Proprietary frame fixings, which may be recommended by the manufacturer, are outside the scope of this Certificate.
- It is essential that the product is installed and used in accordance with the conditions set out in the Design Data and Installation parts of this Certificate.

In addition to the contribution which the product can make to meeting the relevant requirements, the following comments should be noted:

Requirement: A1(1)

Loading

Comment:

When used in conventional masonry cavity walls, the product will not adversely affect the structural stability of the walls. Use of the product does not obviate the need for conventional wall ties between the inner and outer leaves at window or door openings.

Requirement: B3(1)

Internal fire spread (structure)

Comment:

The product is acceptable and acts as a cavity barrier. See sections 12.1 and 12.2 of this Certificate.

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



In the opinion of the BBA, the Rigid-Cor F/Hycor System 3000 F Cavity Closer, 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 complies with the requirements of this Standard. See section 14 of this Certificate.

Regulation: 11

Structure

Standard: C2.1

Stability

Comment:

When used in masonry cavity walls the product will not obviate the need for conventional wall ties between the inner and outer leaves at window or door openings.

Regulation: 12

Structural fire precautions

Standards: D2.1 and D2.2

Structural protection — Principles

Standards: D6.1 and D6.2

Concealed spaces — Principles

Comment:

The product acts as a cavity barrier and can satisfy these Standards. See sections 12.1 and 12.2 of this Certificate.

Regulation: 17

Resistance to moisture

Standard: G3.1

Resistance to precipitation — Resistance to precipitation

Comment:

Walls incorporating the product can comply with the requirements of this Standard. See sections 11.1 to 11.3 of this Certificate.

Regulation: 18

Resistance to condensation

Standard: G4.1

Condensation — Interstitial condensation

Comment:

The product can contribute to satisfying this Standard. See section 10.2 of this Certificate.

Standard: G4.2

Condensation — Surface condensation

Comment:

The product can satisfy this Standard. See section 10.1 of this Certificate.

Regulation: 22

Conservation of fuel and power

Standard: J4.1

Buildings in purpose group 1 — Limiting thermal bridging at junctions and around openings

Standard: J9.1

Buildings in purpose groups 2 to 7 — Limiting thermal bridging at junctions and around openings

Comment:

Walls incorporating the product can satisfy these Standards. See section 10.1 of this Certificate.

3 The Building Regulations (Northern Ireland) 2000



In the opinion of the BBA, the position of the Rigid-Cor F/Hycor System 3000 F Cavity Closer, if used in accordance with the provisions of this Certificate, will satisfy or contribute to satisfying the various Building Regulations listed below.

Regulation: B2

Fitness of materials and workmanship

Comment:

The product is acceptable. See section 14 of this Certificate.

Regulation: C4

Resistance to ground moisture and weather

Comment:

Walls incorporating the product can contribute to meeting this Regulation. See sections 11.1 to 11.3 of this Certificate.

Regulation: C5

Condensation

Comment:

The product can satisfy this Regulation. See section 10.2 of this Certificate.

Regulation:	D1	Stability
Comment:		When used in conventional masonry cavity walls, the product will not adversely affect the structural stability of the walls. Use of the product does not obviate the need for conventional wall ties between the inner and outer leaves at window or door openings.
Regulation:	E4	Internal fire spread – Structure
Comment:		The product is acceptable and acts as a cavity barrier. See sections 12.1 and 12.2 of this Certificate.
Regulation:	F2	Building fabric
Comment:		When the product is used as detailed in this Certificate, adequate provision will have been made to limit the thermal bridging which occurs around the opening of which it forms a part. The detail can therefore contribute to meeting the requirement to make reasonable provisions in the fabric of the building for the conservation of fuel and power. See section 10.1 of this Certificate.

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

In the opinion of the BBA there is no information in this Certificate which relates to the obligations of the client, planning supervisor, designer and contractors to address their obligations under these Regulations.

Technical Specification

5 Description

5.1 The Rigid-Cor F/Hycor System 3000 F Cavity Closer comprises extruded white PVC-U cavity closer profiles, insulated with mineral wool fibre, together with insulated PVC-U corner mouldings, polypropylene brick ties and a timber brace (Hycor System 3000 F only). The closer profiles, ties and corners are shown in Figure 1.

5.2 The product is available in two forms, as 3 m or 6 m Rigid-Cor F bar lengths, for cutting and assembly on site, and as Hycor System 3000 F kits, comprising two jamb sections with corner mouldings, one sill section and a timber brace (all pre-cut in the factory to the required opening size), together with the requisite number of ties.

5.3 The closer profiles and corner mouldings are available in three sizes, to suit cavity widths of 50 mm, 75 mm and 100 mm (see Figure 1).

5.4 The closer profiles, ties and corner mouldings are bought-in from within the IMI Group, and checked visually on receipt. The Hycor System 3000 F kits are pre-assembled (see Figure 2) in the factory to check for fit, dimensions and squareness, before being dismantled for delivery to site.

6 Delivery to site and storage

6.1 Closer profiles are despatched to site in 3 m or 6 m lengths, packed in polythene sleeves with five closers per pack. Ties and corners are delivered to site in polythene bags, the number per bag dependent on site requirements. Hycor System 3000 F kits are despatched to site in polythene bags.

6.2 Each closer pack carries an installation leaflet and bears a label showing the product identification and the BBA symbol incorporating the number of this Certificate.

6.3 Closer packs should be handled with care and supported to avoid distortion or damage. Rigid-Cor F bar lengths should be stored flat.

Figure 1 Components

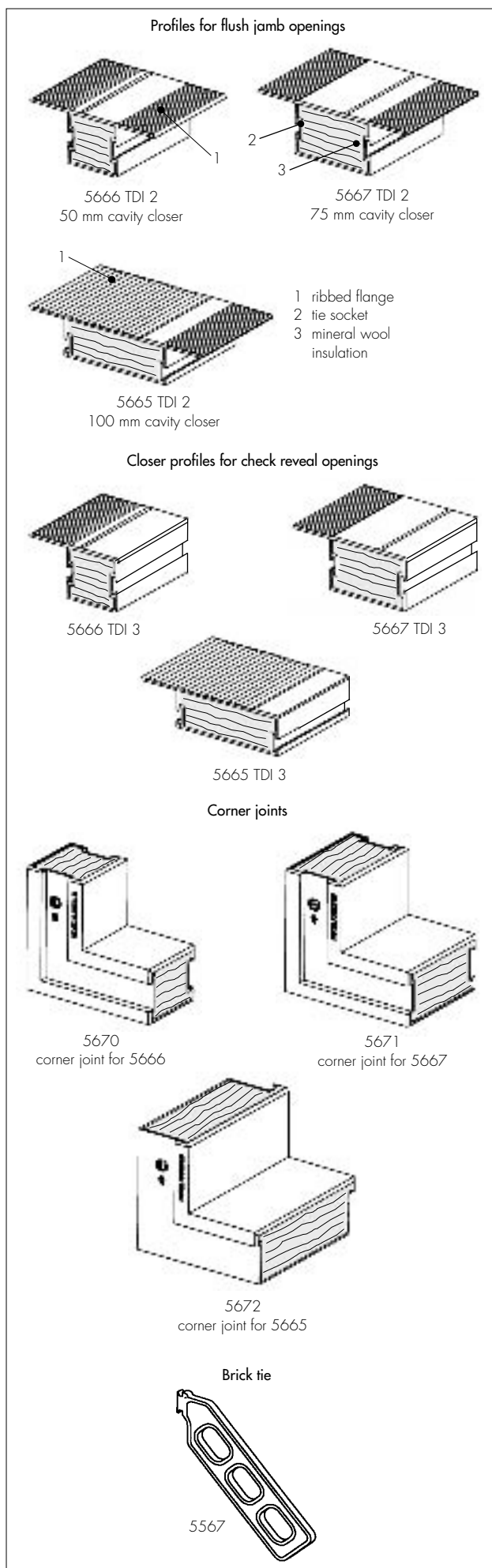
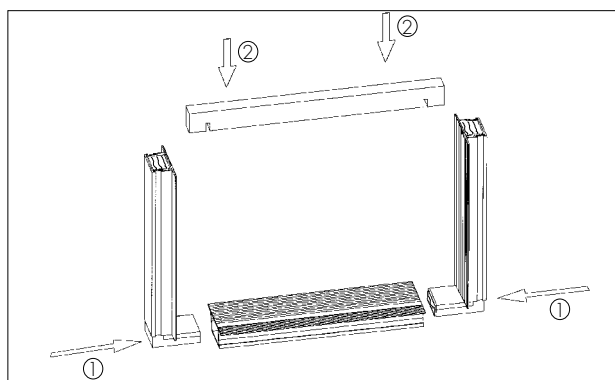


Figure 2 Assembly of Hycor System 3000 F



Design Data

7 General

7.1 The Rigid-Cor F/Hycor System 3000 F Cavity Closer is suitable for use in flush jamb and check reveal masonry walls with cavity widths of 50 mm, 75 mm and 100 mm, and with window/door frames made from timber or PVC-U.

7.2 The product provides an effective means of closing the cavity without forming a thermal bridge, and avoids the need for cutting bricks and blocks.

7.3 The ribbed PVC-U flange can provide an adequate key for traditional plaster finishes. However, in locations where the plaster may be subjected to repeated impact (eg at door reveals from door slamming) it is recommended that wet plaster be reinforced by hessian scrim or preferably replaced by dry lining.

7.4 The product can be used as a template, to form an opening around which a wall can be constructed.

7.5 Masonry walls into which the closers are incorporated must be constructed in accordance with one or more of the following technical specifications:

- BS 5628-1 : 1992 and BS 5628-3 : 2001.
- The national Building Regulations:

England and Wales

Approved Document A1/2, Section 1C.

Scotland

Technical Standards, Part C, *Small Buildings Guide*.

Northern Ireland

Technical Booklet D.

8 Practicability of installation

Installation of the product is straightforward and can be carried out by tradesmen using traditional skills, following the procedures and conditions laid down in this Certificate.


9 Structural stability

9.1 The product must not be used to support loads from the masonry. Lintels are required above window or door openings.

9.2 The product will not have an adverse effect on the structural stability of brickwork or blockwork walls, constructed in the conventional manner in accordance with normal good practice as defined in BS 5628-1 : 1992 and BS 5628-3 : 2001. Use of the cavity frame does not obviate the need for conventional wall ties around the openings.

9.3 Window/door frames must be fixed independently to the masonry. Procedures and fixings for securing frames to the masonry are outside the scope of this Certificate.

10 Hygrothermal behaviour

 10.1 Thermal bridging and the risk of local surface condensation around openings will be acceptable, and meet the following requirements, where the window/door frame is set back by at least 18 mm into the wall cavity and the junctions between the wall and the front and back of the window/door frame are effectively sealed.

England and Wales


Approved Document L1, Paragraphs 1.30 and 1.32
Approved Document L2, Paragraphs 1.9 and 1.11

Scotland


Technical Standards J4.1 and J9.1

Northern Ireland

Technical Booklet F, Paragraph 1.33.

 10.2 Under normal domestic conditions the level of interstitial condensation associated with the product will be low and the risk of any resultant damage minimal.

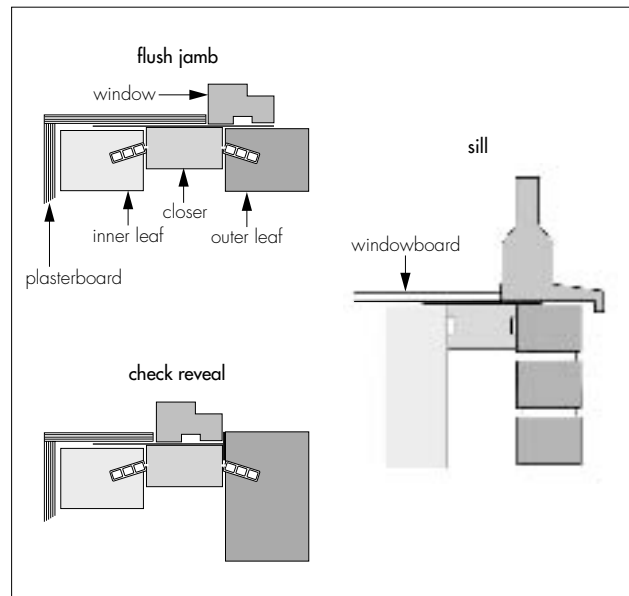
11 Weather resistance

 11.1 The product is effective as a vertical damp-proof barrier at jambs of window and door openings in masonry constructions, where a brick/block closer and dpc detail would normally be used. The product is also effective as a horizontal damp-proof barrier at the sill/threshold.


11.2 In a flush jamb detail (see Figure 3), the product is suitable for use in the 'sheltered' and 'moderate' exposure categories, as defined in Table 11 of BS 5628-3 : 2001 and depicted as exposure zones 1 and 2 in the map shown in section 3.1 of BRE Report BR 262 *Thermal Insulation : avoiding risks* (2002). In this application, the product may also be considered for use in other areas where a conventional return brick/block closer detail with dpc has been found to provide adequate resistance to the penetration of wind-driven rain.

11.3 In a check reveal detail, in which the frame is positioned in a rebate behind the outer leaf of the jamb (see Figure 3), the product is suitable for use in exposure categories up to and including 'very severe' as defined in Table 11 of BS 5628-3 : 2001 which covers all exposure zones in the United Kingdom.

Figure 3 Installation details



12 Properties in relation to fire


 12.1 On the evidence of a fire test generally in accordance with BS 476-20 : 1987 and provided that the closer fits tightly in the cavity, it will act as a cavity barrier at the opening (with respect to the effect of fire penetrating into or out of the cavity), providing a minimum 30 minutes fire resistance with respect to both integrity and insulation.

12.2 The use of the product does not preclude the need to provide suitable fire protection to steel lintels where this is necessary to satisfy the Building Regulations.

13 Maintenance

To ensure the maximum weathertightness, the silicone seal between window or door frames and masonry must be checked regularly and repairs or renewal carried out promptly.

14 Durability

 The product is durable and, protected within the cavity, will not suffer degradation during the normal expected life of a building.

Installation

15 General

15.1 Installation of the product must be carried out in accordance with the manufacturer's instructions.

15.2 Reference should be made to the typical installation details shown in Figure 3, when reading the installation details given in section 16.

15.3 The back edge of the window or door frame must be set back at least 18 mm behind the inner face of the outer leaf (see section 10.1), whilst ensuring that the front edge of the frame remains over the outer leaf.

15.4 The closer must fit tightly between inner and outer leaves, in all positions, to function satisfactorily as a cavity barrier (see section 12.1).

15.5 The junctions between the wall and the front and back of the window/door frame must be effectively sealed (see section 10.1).

16 Procedure

Hycor System 3000 F

16.1 The sill section is push-fitted into the jamb corners to form a three-sided closer. The timber brace is fitted over the jamb flanges to form the fourth side of the closer frame (see Figure 2).

16.2 The wall is built to sill height and the closer frame seated in the cavity.

16.3 The wall is built up at the jambs with the ties clipped into the closer and embedded in the first mortar course (see Figure 3) and thereafter alternately into the inner block leaf (every other course) and outer brick leaf (every sixth course).

16.4 When the wall reaches head height, the timber brace is removed and appropriate insulated lintels and ancillary damp-proof protection incorporated into the wall and butted onto (but not supported by) the jamb closers.

16.5 The window frame is introduced into the opening, set back at least 18 mm behind the outer leaf (see Figure 3), and secured to the outer leaf with conventional fixings.

16.6 To complete the installation a weatherproof sealant is incorporated over a back-up strip between the frame and external masonry leaf, and plaster or dry lining applied at the internal reveal (see section 7.3).

Rigid-Cor F

16.7 Rigid-Cor F bar lengths may be used in various ways:

To form a four-sided frame around which the opening is constructed

16.8 Two jamb closers are cut to the height of the opening.

16.9 A sill closer is cut to the width of the opening less 4 mm (to cover the thickness of PVC).

16.10 The insulated core of the sill closer is pushed out at one end and 120 mm cut off.

16.11 Insulated corners are inserted into the ends of the sill closer, pushing the sill insulation back into place.

16.12 Jamb closers are then pushed onto the sill corners and the insulation, which is forced out the other end of the jamb closer, cut off.

16.13 A length of timber (approximately 20 mm by 40 mm cross section) is notched to the width of the opening less 2 mm and sat on the jamb flanges to complete the fourth side of the frame as shown for Hycor System 3000 F in Figure 2.

16.14 The frame is sat in the cavity of the wall at sill height.

16.15 The installation is completed as described in sections 16.3 to 16.6.

As a three-sided frame

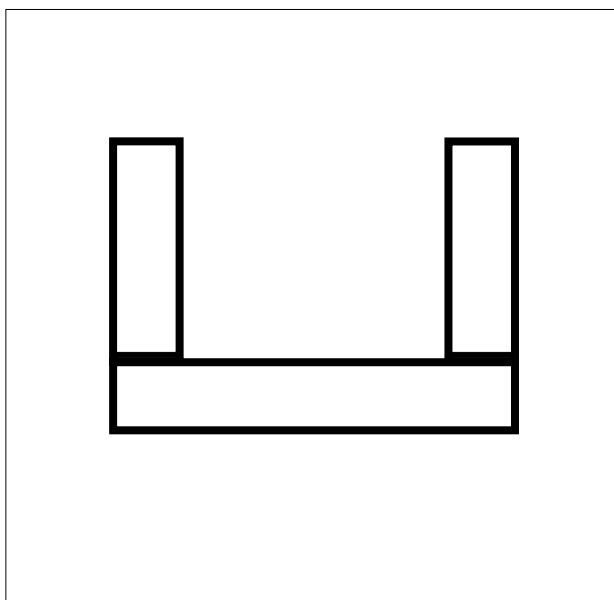
16.16 Rigid-Cor F may be used as described in section 16.8 to 16.15, but without the timber bracing. In this application it is the responsibility of the builder to ensure that the jambs are plumb.

By butting together closer sections

16.17 Rigid-Cor F may be used by butting together closer sections, omitting corner pieces (and timber bracing).

16.18 The sill closer is cut to cover the sill and the two jamb sections (see Figure 4).

Figure 4 Butted closers



16.19 The two jamb closers are cut to length.

16.20 The wall is built to sill height and the sill closer sat in the cavity.

16.21 The jamb closers are set on the sill closer and propped in a vertical position.

16.22 The jamb closers are incorporated into the wall with ties and the window installed as described in sections 16.3 to 16.6.

Refurbishment work⁽¹⁾

16.23 Debris is cleared from existing cavity.

16.24 Jamb closers are cut to the height of the opening, less 2 mm (to cover the thickness of the PVC).

16.25 The sill closer is cut to the width of the opening, plus twice the depth of the closer and the flanges at each end cut back by the depth of the closer (see Figure 4).

16.26 The sill closer is pushed into the sill cavity, with its ends extending under the jambs.

16.27 The jamb closers are pushed into place to sit on the sill closer (see Figure 4) and nailed to the masonry through the pre-drilled holes in the closer flange.

(1) In refurbishment work, the product may not close the cavity sufficiently to act as a cavity barrier (see section 12.1). Some additional protection may be needed for this purpose.

Doors

16.28 Rigid-Cor F may be used to close cavities around doors. For this application only jamb closers and ties are required.

16.29 Jamb closers are cut to the height of opening plus 50 mm.

16.30 At one end of each closer, the flanges are cut back by 50 mm.

16.31 The cut end of closer is placed in the cavity at the threshold, propped in the vertical position and built into the wall with ties as described in section 16.3.

Check reveal

16.32 Both Rigid-Cor F and Hycor System 3000 F versions may be used in a check reveal detail, in which the inner leaf is set in from the outer leaf at the jamb. This construction affords greater weather protection as the window or door frame is set back behind the outer leaf at the jamb, and is the preferred option in more exposed locations, particularly in Scotland and Northern Ireland.

16.33 In this application, the closer, without the outer flange (see Figure 1) is butted against the outer leaf and fixed into the mortar joints of both leaves with brick ties (see Figure 3) following the procedures described in section 16. The window or door frame is then fixed back to the inner leaf using a conventional strap fixing. For check reveal applications, it is recommended that the corner joints (see Figure 1), rather than butted sections (see sections 16.17 to 16.22) are used. Where a timber frame is used, it is recommended that a strip dpc should be positioned between frame and outer leaf.

Technical Investigations

The following is a summary of the technical investigations carried out on the Rigid-Cor F/Hycor System 3000 F Cavity Closer.

17 Tests

17.1 Tests were carried out on PVC-U extrusions to determine:

- shrinkage on heating
- gelation by immersion in acetone.

17.2 Heat ageing stress relief tests were carried out on tie and corner injection mouldings.

17.3 A fire resistance test was carried out on the closer (see section 12.1).

18 Investigations

18.1 The hygrothermal properties of constructions incorporating the product were assessed by computer simulation, in accordance with BRE Information Paper IP 17/01 *Assessing the effects of thermal bridging at junctions and around openings*. The assessment determined the linear thermal transmittance and temperature factor around openings in walls with a U value $\geq 0.3 \text{ Wm}^{-2}\text{K}^{-1}$.

18.2 A window installation was inspected to assess the practicability of the installation.

18.3 Factory visits were made to assess the manufacture and quality control of the extruded profiles.

18.4 An assessment was made of:

- durability of all materials and components used in the construction of the product
- weathertightness of the product when installed in accordance with the manufacturer's instructions
- fire resistance and structural stability of walls incorporating the product.

Bibliography

BS 476-20 : 1987 *Fire tests on building materials and structures — Method for determination of the fire resistance of elements of construction (general principles)*

BS 5628-1 : 1992 *Code of practice for use of masonry — Structural use of unreinforced masonry*

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

Conditions of Certification

19 Conditions

19.1 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.

19.2 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.

19.3 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.

19.4 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.

19.5 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.



In the opinion of the British Board of Agrément, the Rigid-Cor F/Hycor System 3000 F Cavity Closer is fit for its intended use provided it is installed, used and maintained as set out in this Certificate. Certificate No 03/4069 is accordingly awarded to T.D.I. (UK) Ltd.

On behalf of the British Board of Agrément

A handwritten signature in black ink, appearing to read 'P. Q. Newson'.

Date of issue: 18th December 2003

Chief Executive