

## Cavalok Building Products Ltd

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Agrément Certificate  
No 00/3673

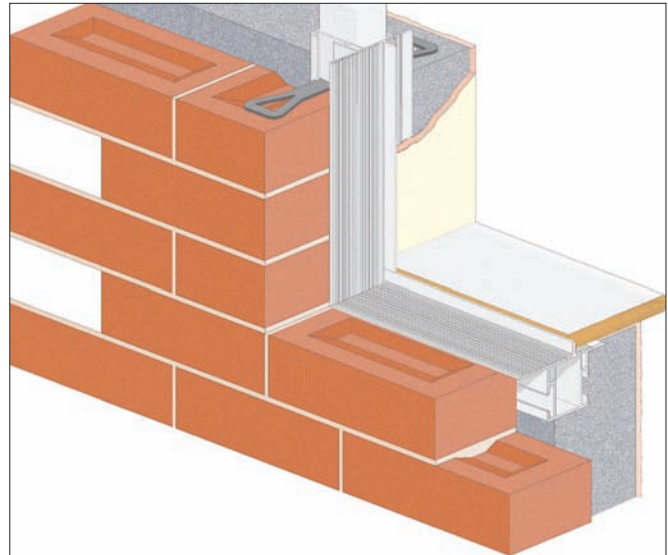
### PRODUCT SHEET 1 — CAVALOK CAVITY CLOSER AND FRAME ACCEPTOR SYSTEM

#### PRODUCT SCOPE AND SUMMARY OF CERTIFICATE

This Certificate relates to the Cavalok Cavity Closer and Frame Acceptor System, a PVC-U cavity closer and window or door acceptor used as a template for forming an opening in masonry cavity walls and timber- and steel-framed buildings during construction and can provide ventilation via the head vent section.

#### 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

**Hygrothermal behaviour** — the system can be used in Accredited Construction Details (version 1.0) and Robust Details for jambs and sills which require a path of minimum thermal resistance through the closer of  $0.45 \text{ Wm}^{-2}\text{K}^{-1}$  (see section 5).

**Weather resistance** — the system is effective as a damp-proof barrier and when used in a suitable wall construction will resist the passage of water into the interior of the building (see section 6).

**Structural stability** — in terms of wind loading resistance the system can be used in all areas of the UK. The system must not be used to support loads from the masonry (see section 7).

**Properties in relation to fire** — the installed system will not contribute significantly to the growth of a fire. The system does not constitute a cavity barrier (see section 8).

**Durability** — the system, protected within the cavity, will last the normal expected life of a building (see section 11).

The BBA has awarded this Agrément Certificate for the Cavalok Cavity Closer and Frame Acceptor System to Cavalok Building Products 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

Head of Approvals  
— Physics

Chief Executive

Date of First issue: 24 March 2000

Date of Third issue: 25 July 2008

*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](http://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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In the opinion of the BBA, the Cavalok Cavity Closer and Frame Acceptor System, 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:	<b>C2(b)</b>	Resistance to moisture
Comment:		The system prevents the passage of moisture from the outer leaf to the inner leaf of a cavity wall at window or door openings. See sections 6.1 to 6.4 of this Certificate.
Requirement:	<b>C2(c)</b>	Resistance to moisture
Comment:		The system can contribute to meeting this Requirement. See sections 5.3 and 5.4 of this Certificate.
Requirement:	<b>F1</b>	Means of ventilation
Comment:		Background ventilation can be provided to meet this Requirement. See sections 3.5 and 3.6 of this Certificate.
Requirement:	<b>L1(a)(i)</b>	Conservation of fuel and power
Comment:		The system contributes to minimising heat loss at jambs and sills. See sections 5.1 and 5.2 of this Certificate.
Requirement:	<b>Regulation 7</b>	Materials and workmanship
Comment:		The system is acceptable. See section 11 and the <i>Installation</i> part of this Certificate.
In addition to the contribution which the system can make to meeting the relevant Requirements, the following comments should be noted:		
Requirement:	<b>A1</b>	Loading
Comment:		When used in conventional masonry cavity walls, the system will not adversely affect the structural stability of the walls. Use of the system does not obviate the need for conventional wall ties between the inner and outer leaves at window and door openings. See sections 7.1 and 7.2 of this Certificate.
Requirement:	<b>B3(4)</b>	Internal fire spread (structure)
Comment:		The system can be used in constructions that meet this Requirement. See sections 8.1 to 8.3 of this Certificate.



## The Building (Scotland) Regulations 2004 (as amended)

Regulation:	<b>8(1)(2)</b>	<b>Fitness and durability of materials and workmanship</b>
Comment:		The system can contribute to a construction satisfying this Regulation. See sections 10 and 11 and the <i>Installation</i> part of this Certificate.
Regulation:	<b>9</b>	<b>Building standards — construction</b>
Standard:	3.10	Precipitation
Comment:		Walls incorporating the system can satisfy this Standard, with reference to clauses 3.10.1 <sup>(1)(2)</sup> and 3.10.3 <sup>(1)(2)</sup> . See sections 6.1 to 6.4 of this Certificate.
Standard:	3.14	Ventilation
Comment:		Background ventilation can be provided to satisfy this Standard, with reference to clauses 3.14.2 <sup>(2)</sup> , 3.14.3 <sup>(1)(2)</sup> and 3.14.5 <sup>(1)</sup> . See sections 3.5 and 3.6 of this Certificate.
Standard:	3.15	Condensation
Comment:		The system can contribute to minimising the risk of condensation, with reference to clauses 3.15.1 <sup>(1)</sup> , 3.15.4 <sup>(1)</sup> and 3.15.5 <sup>(1)</sup> . See sections 5.3 and 5.4 of this Certificate.
Standard:	6.1(b)	Carbon dioxide emissions
Standard:	6.2	Building insulation envelope
Comment:		The system can contribute to minimising heat loss at jambs and sill, with reference to clauses 6.2.3 <sup>(1)</sup> , 6.2.4 <sup>(1)(2)</sup> and 6.2.5 <sup>(2)</sup> . See section 5.1 of this Certificate.
Regulation:	<b>12</b>	<b>Building standards — conversions</b>
Comment:		All comments given for this system under Regulation 9, also apply to this Regulation, with reference to clause 0.12.1 <sup>(1)(2)</sup> and Schedule 6 <sup>(1)(2)</sup> .

In addition to the contribution which the system can make to satisfying the relevant Standards, the following comments should be noted:

Regulation:	<b>9</b>	<b>Building standards — construction</b>
Standard:	1.1(a)(b)	Structure
Comment:		When used in conventional masonry cavity walls the system will not obviate the need for conventional wall ties between the inner and outer leaves at window and door openings, with reference to clause 1.1.1 <sup>(1)(2)</sup> . Door frames require additional fixings. See sections 7.1 and 7.2 of this Certificate.
Standard:	2.4	Cavities
Comment:		In conjunction with a cavity barrier, the system can satisfy this Standard, with reference to clause 2.4.1 <sup>(1)(2)</sup> and Annex 2.B <sup>(1)</sup> or 2.D <sup>(2)</sup> . The system does not constitute a cavity barrier. See sections 8.1 to 8.3 of this Certificate.

(1) Technical Handbook (Domestic).

(2) Technical Handbook (Non-Domestic).



## The Building Regulations (Northern Ireland) 2000 (as amended)

Regulation:	<b>B2</b>	Fitness of materials and workmanship
Comment:		The system is acceptable. See section 1.1 and the <i>Installation</i> part of this Certificate.
Regulation:	<b>B3(2)</b>	Suitability of certain materials
Comment:		The system is acceptable. See section 1.0 of this Certificate.
Regulation:	<b>C4(b)</b>	Resistance to ground moisture and weather
Comment:		Walls incorporating the system can contribute to meeting this Regulation. The sub-frame can be used where checked reveals are required. See sections 6.1 to 6.4 of this Certificate.
Regulation:	<b>C5</b>	Condensation
Comment:		The system can contribute to satisfying this Regulation. See section 5.4 of this Certificate.
Regulation:	<b>F2(a)(i)</b>	Conservation measures
Regulation:	<b>F3(2)</b>	Target carbon dioxide Emissions Rate
Comment:		The system can contribute to minimising heat loss at jambs and sills. See section 5.1 of this Certificate.
Regulation:	<b>K2</b>	Means of ventilation
Comment:		The system can contribute to meeting this Regulation. See section 3.6 of this Certificate.

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

Regulation:	<b>D1</b>	Stability
Comment:		When used in conventional masonry cavity walls, the system will not obviate the need for conventional wall ties between the inner and outer leaves at around window and door openings. Door frames require additional fixings. See sections 7.1 and 7.2 of this Certificate.
Regulation:	<b>E4(4)</b>	Internal fire spread – Structure
Comment:		The system does not constitute a cavity barrier. See sections 8.1 to 8.3 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 2007

NHBC accepts the use of the Cavalok Cavity Closer and Frame Acceptor System, 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, the Cavalok Cavity Closer and Frame Acceptor System, 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 – thermal insulation*.

## General

This Certificate relates to the Cavalok Cavity Closer and Frame Acceptor System for use in masonry walls and timber and steel framed buildings with cavity widths of 50 mm, 75 mm, 90 mm, 100 mm. The system will accommodate larger cavities by using combinations of the 50 mm, 75 mm, 90 mm and 100 mm styles screwed together.

The system closes the cavity at window and door openings without forming a thermal bridge, 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. It can be used in check reveal installations and can accommodate externally and internally installed windows. The system is suitable for use with timber, PVC-U, aluminium or steel window and door frames. When the system is used with the head vent section and suitably-sized trickle ventilator, it can contribute to satisfying the background ventilation requirements of the various Building Regulations. Details of ventilators covered by an Agrément Certificate can be found on the BBA website.

The closers are non-loadbearing and window and door frames must be fixed independently on the masonry. Proprietary frame fixings, which may be recommended by the manufacturer, are outside the scope of this Certificate.

It is important that the designers, planners, contractors and/or installers ensure that the system is installed and used in accordance with the Certificate holder's instructions and the information given in this Certificate.

# Technical Specification

## 1 Description

1.1 The Cavalok Cavity Closer and Frame Acceptor System is a three sided, U-shaped, PVC-U frame with either a PVC-U brace system (see Figure 1) or a temporary timber head brace (removed after installation) (see Figure 2). Alternatively, a head vent profile is mechanically joined to form the head section. For some applications a four-sided frame can also be produced.

Figure 1 Closer frame with PVC-U brace



Figure 2 Closer frame with timber brace



1.2 The PVC-U sections of the frame are box profiles, available with or without EPS insulation. Uninsulated profiles have their open end sealed with a polystyrene plug (see Figure 3) and joined together either by welding or mechanically, with a push-fitted corner joint (see Figure 1). Sections for use at the jamb and for externally-installed windows at the sill, have an upstand against which the window frame is positioned.

1.3 Alternatively, when using a variant without an upstand, the window should be positioned 30 mm over the cavity and fixed to the inner structure using a proprietary strap fixing (see Figure 4).

1.4 PVC-U sections are available to suit 50 mm, 75 mm, 90 mm and 100 mm wide cavities. Larger cavities can be accommodated by using various combinations of the PVC-U sections screwed together (see Figure 5).

Figure 3 Typical closer section

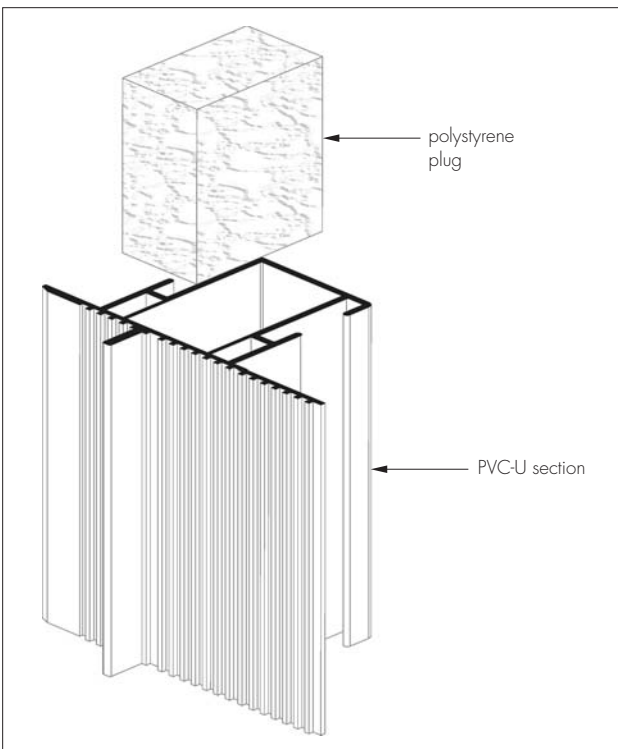
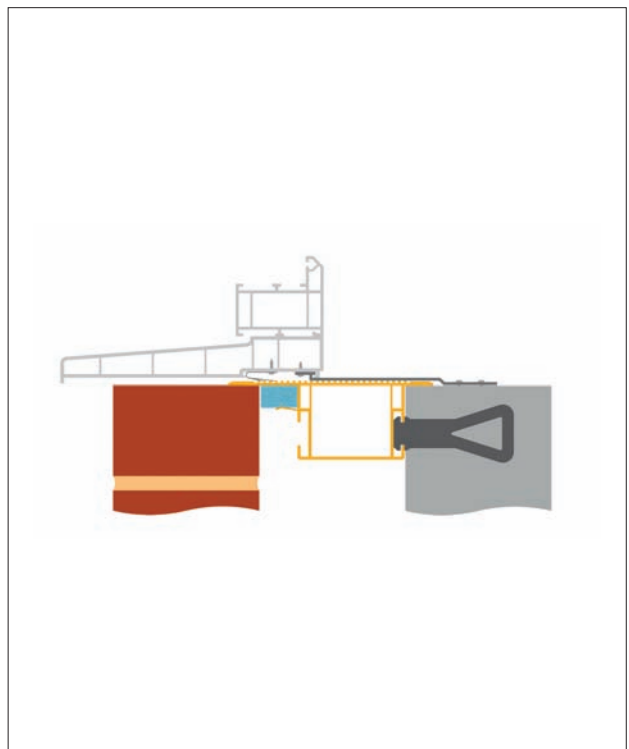
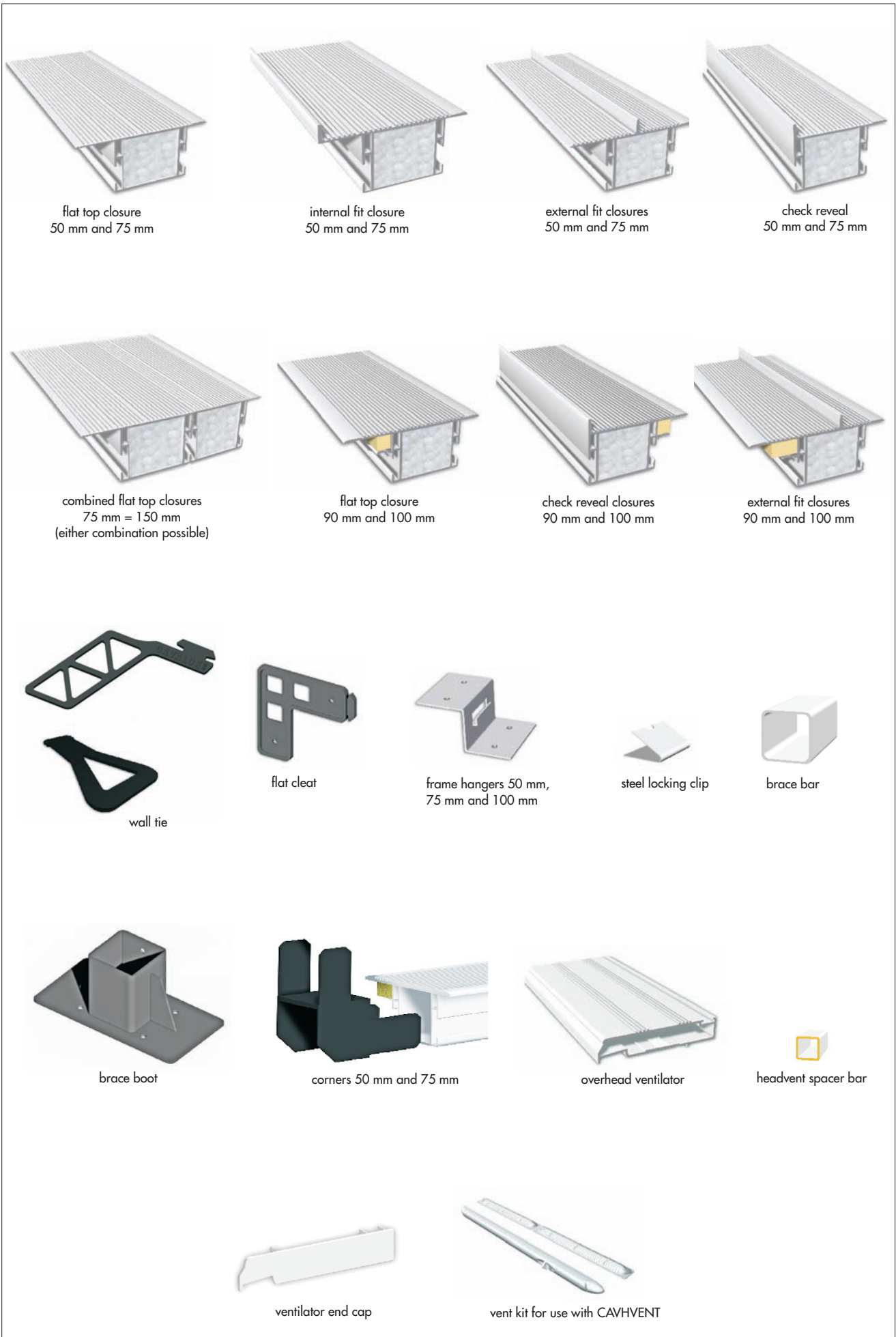


Figure 4 Typical strap fixing





1.5 Polypropylene ties are available from the manufacturer for fixing the frame into the surrounding masonry, and stainless steel clips for securing the frame to the closer when using an upstand variant (see Figure 5).

1.6 A suitable double-sided glazing tape or wet silicone bead is used to seal the joints between the window frame and closer upstand. However the tape is not a part of the specified system and is outside the scope of this Certificate. Security glazing tapes covered by a BBA Agrément Certificate would be suitable.

1.7 The PVC-U closer sections are produced by conventional extrusion procedures. Quality control checks on the extrusion include heat ageing, heat reversion and dimensions.

## 2 Delivery to site and storage

2.1 Closer sections are transported in shrink-wrapped bundles of fifty 6 m lengths. Ancillary items are dispatched in bags or boxes. The packs bear product identification, a manufacturing reference and the BBA symbol incorporating the number of this Certificate.

2.2 The closer frame and window frame with protected clips fixed in position are dispatched to site from the fabricator as individual units, with the fixing ties in bags. Care should be taken to ensure that the clips protruding from the window frame are suitably protected from damage during transit.

2.3 Closer and window frames should be handled with care and stored under cover in a clean area, and suitably supported to avoid distortion or damage.

## Assessment and Technical Investigations

The following is a summary of the assessment and technical investigations carried out on the Cavalok Cavity Closer and Frame Acceptor System.

### Design Considerations


## 3 General

3.1 The Cavalok Cavity Closer and Frame Acceptor System is suitable for use in masonry walls with cavity widths of 50 mm, 75 mm, 90 mm, 100 mm and larger sizes by using various combinations of the PVC-U sections screwed together for fixing PVC-U, timber and metal windows. It can also be used in timber-framed and steel-framed buildings.

3.2 The system provides an effective means of closing the cavity without forming a thermal bridge, and avoids the need for cutting bricks and blocks. It can also be used to form a check reveal where required and can accommodate externally and internally installed windows.

3.3 Proprietary frame fixings, which may be recommended by the manufacturer, are not covered by this Certificate.

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

 3.5 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 : 2005 and BS 5628-3 : 2005
- the national Building Regulations:

**England and Wales** — Approved Document A1/2, Section 1C

**Scotland** — Mandatory Standard 1.1<sup>(1)(2)</sup> *Small Buildings Guide*.

(1) Technical Handbook (Domestic).


(2) Technical Handbook (Non-Domestic).

 3.6 When the system is used with the ventilated head section and suitably-sized trickle ventilator, outside the scope of this Certificate, it can contribute to satisfying the background ventilation requirements of the various building regulations. Details of ventilators covered by an Agrément Certificate can be found on the BBA website.

## 4 Practicability of installation

Installation of the system is straightforward and can be carried out by tradesmen using traditional skills, provided the installation instructions are followed.

## 5 Hygrothermal behaviour

 5.1 The system, which includes the EPS internal insulation and the CUC90HOR and CUC100HOR uninsulated, has a path of minimum thermal resistance through the closer of at least  $0.45 \text{ m}^2\text{KW}^{-1}$  when used in jambs and sills with the window/door frame set-back 30 mm or more into the wall cavity (see Figure 7). The system, therefore, can be used in accordance with the Accredited Construction Details (version 1.0) to limit heat loss and assign the default heat loss rates in BRE Information Paper IP 1/06 *Assessing the effects of thermal bridging at junctions and around openings*, Table 3, in SAP and SBEM calculations.



5.2 The components LOK50CHK, CUC90HOR and CUC100HOR listed in Table 1 (using the suggested internal linings) will have a path of minimum resistance through external lining, the closer and the internal linings of at least  $0.45 \text{ m}^2\text{KW}^{-1}$  when used in jambs and sills with the window/door frame set-back 30 mm or more into the wall cavity (see Figure 7). The components, therefore, can be used in accordance with the Robust Details to limit heat loss and assign the default heat loss rates in BRE Information Paper IP 1/06, Table 3, in SAP and SBEM calculations.

Table 1 Robust Detail assessment

Closer type	Extra material required so that $R \geq 0.45 \text{ m}^2\text{KW}^{-1}$	
LOK50HOR, LOK50EXT, LOK50VER 2 x 50 mm and 125 mm (with 50 mm closer on cold side)	Sill	15 mm wooden <sup>(1)</sup> sill
	Jamb	Plasterboard on dabs <sup>(2)</sup>
JEL75HOR, JEL75VER, LOK75HOR, LOK75VER, LOK75EXT, JEL75EXT, CUC90EXT, CUC100EXT 125 mm and 150mm (with 75 mm closer on cold side)	Sill	21 mm wooden <sup>(1)</sup> sill
	Jamb	Plasterboard on dabs <sup>(2)</sup>
LOK75CHK	Sill	12 mm wooden <sup>(1)</sup> sill
	Jamb	Plasterboard on dabs
CUC90CHK, CUC100CHK	Sill	11 mm wooden <sup>(1)</sup> sill
	Jamb	Plasterboard on dabs <sup>(2)</sup>

(1) Softwood ( $\lambda = 0.13 \text{ Wm}^{-1}\text{K}^{-1}$ ) at  $\rho = 630 \text{ kgm}^{-3}$  (CIBSE Guide A : 2006 *Environmental Design*, Table 3.39).

(2) 15 mm air space ( $R = 0.17 \text{ m}^2\text{KW}^{-1}$  – BR 443 *Conventions for U-value calculations*) plus 10 mm plasterboard ( $\lambda = 0.25 \text{ Wm}^{-1}\text{K}^{-1}$  – EN 12524).



5.3 Jambs and sills incorporating the system in accordance with section 5.1 will adequately limit the risk of local surface condensation.



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

5.5 Door frames installed with proprietary fixings which cannot be set-back into the wall cavity by 30 mm may require additional thermal insulation, for example insulated dry lining, to minimise excessive heat loss and the risk of excessive surface condensation.

## 6 Weather resistance



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

6.2 With externally-installed windows, the system is suitable for use in exposure categories up to at least 'severe', as defined in BS 5628-3 : 2005, Table 11, and depicted as exposure zones 1, 2 and 3 in the map shown in BRE report (BR 262 : 2002) *Thermal insulation : avoiding risks*, Section 3.1.

6.3 For windows installed internally into a flush-jamb detail, the system is suitable for use in exposure categories up to at least 'severe' as described in section 5.2, subject to satisfactory performance of the glazing tape.

6.4 For very severe exposure conditions, as defined in the Standard and Report (see section 6.2), the use of the check reveal version of the product is recommended. However, satisfactory performance in this application will depend upon the performance of the glazing tape and its silicone seal (see the Figure *Installation details* in the *Installation* part of this Certificate).

## 7 Structural stability



7.1 The system is non-loadbearing and must not be used to support loads from the masonry. Lintels are required above window and door openings.

7.2 The system 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 : 2005 and BS 5628-3 : 2005. Use of the product does not obviate the need for conventional wall ties around openings.

7.3 PVC-U windows fixed to the closer frame with retaining clips, to the masonry or lintel at the head, and, where necessary, to the inner leaf at the sill, or alternatively by a proprietary strap fixing, will satisfactorily transfer to the structure the wind loads likely to be encountered in the UK. It is recommended that window frames are reinforced, particularly those:

- with side members over 1 m in length
- used in exposed areas
- with an opening light at the jamb.

7.4 For opening light windows there is a tendency for the frame to distort under the forces exerted by the clips, when the window is opened. This is particularly so for unreinforced window frames. To prevent this distortion, additional screw fixing of the frame to the closer is recommended, as detailed in the Certificate holder's *Cavalok Technical Fabrication Manual*.

## 8 Properties in relation to fire



8.1 The system will not contribute significantly to the growth of a fire. On exposure to fire, a surface char rapidly forms and inhibits further combustion.

8.2 The system does not constitute a cavity barrier against the penetration of smoke and flame in the context of the Building Regulations. This does not prevent its use in England and Wales or Northern Ireland, where cavity barriers are not required around openings. In Scotland, however, the product is only suitable for use in conjunction with a cavity barrier meeting the performance requirements defined in Mandatory Standard 2.4, clause 2.4.1<sup>(1)(2)</sup> and Annex 2.B<sup>(1)</sup> or Annex 2.D<sup>(2)</sup>.

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

(1) Technical Handbook (Domestic).

(2) Technical Handbook (Non-Domestic).

## 9 Security against intrusion

Removal of the window from outside is virtually impossible as the retaining clips cannot be disengaged from outside and the head is fixed to masonry or a lintel.

## 10 Maintenance



To ensure the maximum weathertightness, the silicone seals to the external window joints must be checked regularly and repairs or renewal carried out promptly.

## 11 Durability



The system and accessories<sup>(1)</sup>, protected within the cavity, are assessed as durable and, when installed in accordance with this Certificate, will not suffer degradation during the normal expected life of a building.

(1) Excluding the double-sided glazing tape (see section 1.6) — outside the scope of this Certificate.

# Installation

## 12 General

12.1 Installation of the Cavalok Cavity Closer and Frame Acceptor System must be carried out in accordance with the manufacturer's instructions.

12.2 Reference should be made to the typical installation details shown in Figure 6, when reading the installation details given in section 13. Care needs to be taken to ensure that when the 50 mm closer is used in externally-installed applications it is positioned the correct way round such that window/door frames are set-back by at least 30 mm over the cavity.

12.3 The clip fixing system has been approved for use only with PVC-U windows.

12.4 The closer frame must be assembled in accordance with the *Cavalok Technical Fabrication Manual* or by an approved fabricator.

12.5 The closer is selected to suit the application (see Figure 6), ie:

- 50 mm, 75 mm, 90 mm, 100 mm or larger cavity widths
- check reveal or flush jamb
- internally- or externally-installed window.

12.6 The installation details required to meet thermal requirements (see section 5.1) must be observed.

## 13 Procedure

### Closer frame

13.1 The cavity wall is built to the sill level.

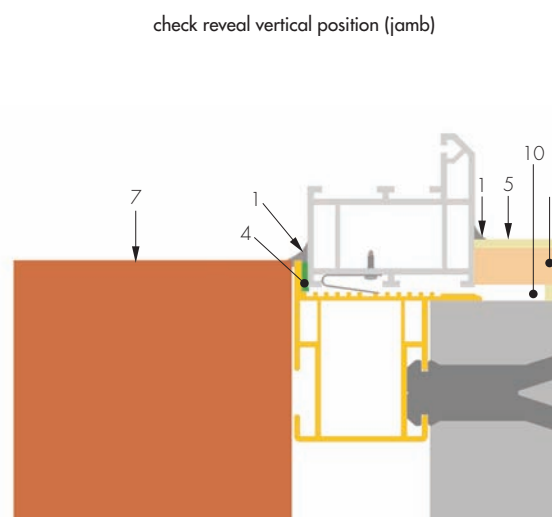
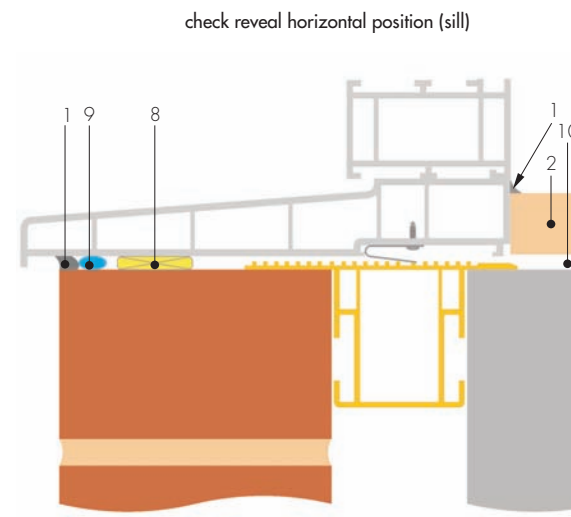
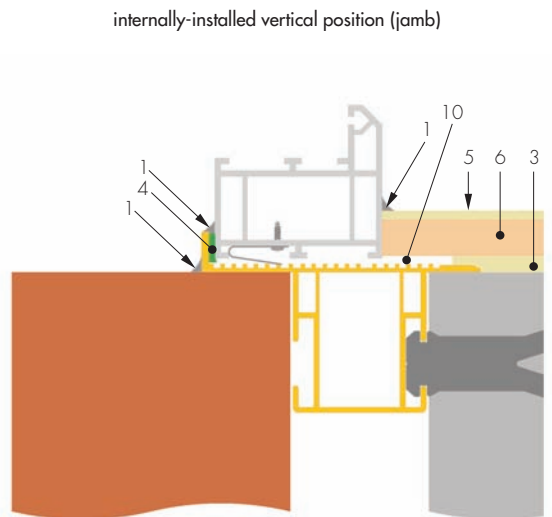
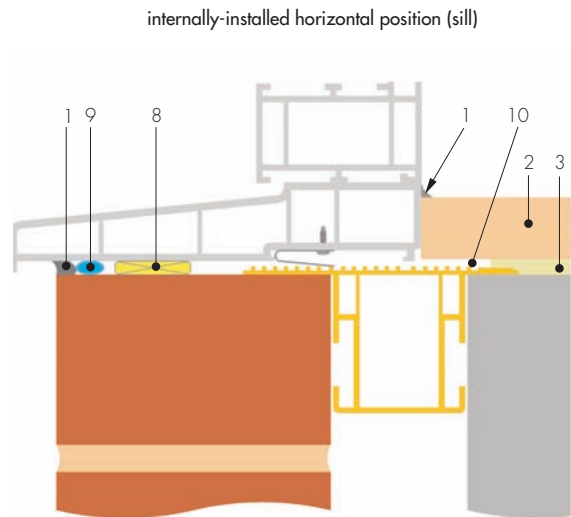
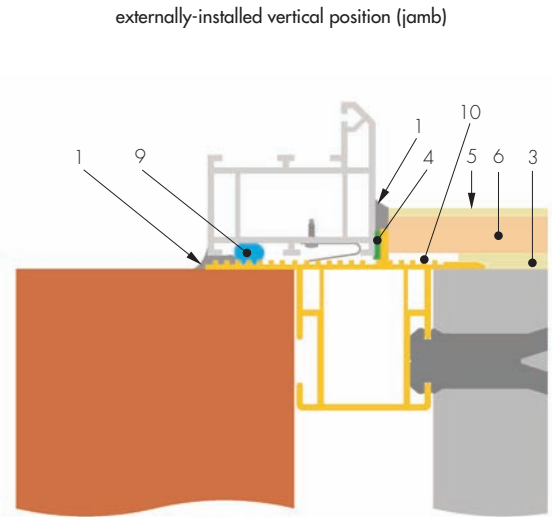
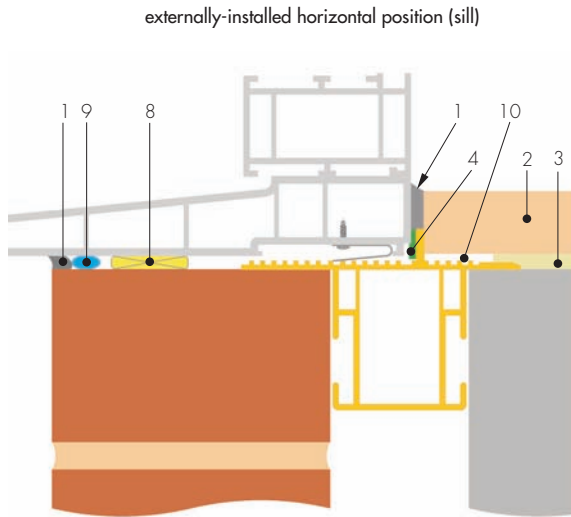
13.2 The closer frame is placed correctly, in the sill cavity and propped vertically, with the box up against the outer leaf.

13.3 The box should be a tight fit in the cavity. If not, it is recommended that, after installation, the closer frame or window frame should be fixed back to the inner leaf at the sill with a rigid strap fixing or equivalent, particularly for installations involving larger windows (above 1 m wide) and/or in exposed conditions.

13.4 Masonry is built up around the closer to lintel height and fixed to the closer frame with ties, fitted into the closer channel and embedded in alternate mortar courses of the outer brick leaf (every sixth course) and inner block leaf (every other course).

13.5 When the mortar has set, the timber or PVC-U bracing is removed from the closer frame and the lintel positioned at the head ensuring that it is supported only by the masonry, ie the closer must not bear any weight.

Figure 6 Installation details



- |   |                                 |                        |
|---|---------------------------------|------------------------|
| 1 silicone sealant  | 4 glazing tape                  | 8 glazing packer       |
| 2 22 mm window board  | 5 3 mm plaster skin             | 9 foam strip           |
| 3 7 mm plaster skim set back at least 25 mm from the window frame | 6 13 mm plasterboard            | 10 5 mm deep air space |
|   | 7 brick line flush with upstand |                        |

## PVC-U windows

13.6 Stainless steel clips can be fitted to the window frame (see Figure 7) or alternatively, fixing straps can be used.

Figure 7 Window with clips



13.7 The window frame is pushed centrally into the opening ensuring that it locates against the closer stop at jamb and sill and that all clips engage.

13.8 The head of the frame is fixed back to the masonry or lintel.

13.9 Where necessary the window frame is fixed back to the inner leaf at the sill (see section 13.3).

13.10 A silicone sealant is applied at appropriate positions around the window frame (see Figure 6).

### PVC-U, aluminum, wood and steel windows

13.11 Strap fixing should be fixed to the underside of window profile and fixed back with screws onto the structural opening.

13.12 For timber-frame construction, strapping is back to the wood internal structural opening.

13.13 For brickwork/blockwork construction, strapping is back to the internal blockwork.

13.14 For steelframe construction, strapping is back to the internal steel opening.

## Technical Investigations

The following is a summary of the technical investigations carried out on the Cavalok Cavity Closer and Frame Acceptor System.

### 14 Tests

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

- shrinkage on heating
- gelation by immersion in acetone
- tensile impact, before and after heat ageing.

14.2 Tests were carried out in accordance with the methods defined in MOAT No 1 : 1974, on a combined closer and PVC-U window, installed in a test rig, to determine:

- air permeability
- effect of cyclic wind loads to  $\pm 1250$  Pa
- effect of temperature variation ( $-5^{\circ}\text{C}$  to  $55^{\circ}\text{C}$ ) on resistance to wind loading
- resistance to wind loads of  $\pm 3000$  Pa (Safety test)
- resistance to wind gusting from 0 to 750 Pa.

## 15 Investigations

An assessment was made of:

- the hygrothermal properties of constructions incorporating the system. In making this assessment, reference was made, as appropriate, to the Accredited Construction Details (version 1.0), the Accredited Construction Details (Scotland), the 'Robust Construction Details'<sup>(1)</sup>, BRE report (BR 262 : 2002) and BRE Information Paper IP 01/06.
- the practicability of the installation.
- the manufacture and quality control of the extruded profiles.
- durability of all materials and components used in the construction of the system
- weathertightness of the product when installed in accordance with the manufacturer's instructions
- fire resistance and structural stability of walls incorporating the system
- weatherability of the exposed closer upstand in the internally-installed window application.

(1) *Limiting thermal bridging and air leakage : Robust construction details for dwellings and similar buildings* TSO 2002.

## Bibliography

BS 5628-1 : 2005 *Code of practice for the use of masonry — Structural use of unreinforced masonry*

BS 5628-3 : 2005 *Code of practice for the use of masonry — Materials and components, design and workmanship*

EN 12524 : 2000 *Building materials and products — Hygrothermal properties — Tabulated design values*

MOAT No 1 : 1974 *Directive for the Assessment of Windows*

## 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.