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Agrément Certificate

12/4891

Product Sheet 2

TREMCO ILLBRUCK WINDOW AND DOOR PRODUCTS

ILLBRUCK i3 SYSTEM (ILLBRUCK ME500 or ME501 DUO WINDOW MEMBRANES — EXTERNAL WEATHER SEAL, ILLBRUCK FM230 PRO FOAM WINDOW — MIDDLE INSULATION SEAL, ILLBRUCK ME500 or ME501 DUO WINDOW MEMBRANES — INTERNAL AIRTIGHT SEAL)

This Agrément Certificate Product Sheet⁽¹⁾ relates to the illbruck i3 System (illbruck ME500 or ME501 Duo Window Membranes — External Weather Seal, illbruck FM230 Pro Foam Window — Middle Insulation Seal, illbruck ME500 or ME501 Duo Window Membrane — Internal Airtight Seal), for use around windows and doors to provide a weathertight external seal, thermal and acoustic insulation, and an internal airtight seal.

(1) Hereinafter referred to as 'Certificate'.

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

Weathertightness — the system will resist the passage of wind-driven rain, snow, run-off water and dust into the interior of the building (see section 6).

Air barrier continuity — the system will contribute to maintaining air barrier continuity at lintels, jambs and cills according to Accredited Construction Details, Version 1.0 (England, Wales and Northern Ireland) and Accredited Construction Details (Scotland) (see section 7).

Thermal performance — the system can improve the thermal performance of the building (see section 8).

Risk of condensation — the system will adequately limit the risk of interstitial and surface condensation, but the risk of interstitial condensation will depend on the construction and should be assessed for each project (see section 9).

Acoustic performance — the installed system may reduce the transmission of airborne sound (see section 10).

Durability — the system, when properly specified and installed, will have a life comparable with that of the installed window or door frame (see section 12).

The BBA has awarded this Certificate to the company named above for the system described herein. This system has been assessed by the BBA as being fit for its intended use provided it is installed, used and maintained as set out in this Certificate.

On behalf of the British Board of Agrément

Date of Second issue: 19 November 2014

Originally certificated on 13 February 2012

Simon Wroe

Head of Approvals — Materials

Claire Curtis-Thomas

Chief Executive

The BBA is a UKAS accredited certification body — Number 113. The schedule of the current scope of accreditation for product certification is available in pdf format via the UKAS link on the BBA website at www.bbacerts.co.uk

Readers are advised to check the validity and latest issue number of this Agrément Certificate by either referring to the BBA website or contacting the BBA direct.

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Regulations

In the opinion of the BBA, the illbruck i3 System (illbruck ME500 or ME501 Duo Window Membranes — External Weather Seal, illbruck FM230 Pro Foam Window — Middle Insulation Seal, illbruck ME500 or ME501 Duo Window Membrane — Internal Airtight Seal), if installed, used and maintained in accordance with this Certificate, can satisfy or contribute to satisfying the relevant requirements of the following Building Regulations (the presence of a UK map indicates that the subject is related to the Building Regulations in the region or regions of the UK depicted):



The Building Regulations 2010 (England and Wales) (as amended)

Requirement:	C2(b)	Resistance to moisture
Comment:	The system will contribute to an installation meeting this Requirement. See section 6 of this Certificate.	
Requirement:	C2(c)	Resistance to moisture
Comment:	The system will contribute to an installation meeting this Requirement with respect to interstitial condensation. See section 9 of this Certificate.	
Requirement:	L1(a)(i)	Conservation of fuel and power
Comment:	The system can contribute to minimising heat loss at lintels, jambs and cills. See sections 7 and 8 of this Certificate.	
Regulation:	7	Materials and workmanship
Comment:	The materials are acceptable. See section 12 and the <i>Installation</i> part of this Certificate.	
Regulation:	26	CO₂ emission rates for new buildings
Comment:	The system can contribute to minimising heat loss at jambs and cills. See sections 7 and 8 of this Certificate.	
Regulation:	26A	Fabric energy efficiency rates for new dwellings (applicable to England only)
Comment:	The system can contribute to meeting these Regulations. See sections 7 and 8 of this Certificate.	



The Building (Scotland) Regulations 2004 (as amended)

Regulation:	8(1)	Durability, workmanship and fitness of materials
Comment:	The use of the system satisfies the requirements of this Regulation. See section 12 and the <i>Installation</i> part of this Certificate.	
Regulation:	9	Building standards applicable to construction
Standard:	3.10	Precipitation
Comment:	The system will resist the effects of driving rain and enable an installation to satisfy the requirements of this Standard, with reference to clause 3.10.1 ⁽¹⁾⁽²⁾ . See section 6 of this Certificate.	
Standard:	3.15	Condensation
Comment:	The system can contribute to minimising the risk of interstitial and surface condensation, with reference to clauses 3.15.1 ⁽¹⁾ , 3.15.4 ⁽¹⁾ and 3.15.5 ⁽¹⁾ . See section 9 of this Certificate.	
Standard:	6.1b	Carbon dioxide emissions
Standard:	6.2	Building insulation envelope
Comment:	The system can contribute to minimising heat loss at lintels, jambs and cills. See sections 7 and 8 of this Certificate.	
Standard:	7.1(a)	Statement of sustainability
Comment:	The system can contribute to meeting the relevant requirements of Regulation 9, Standards 1 to 6 and therefore will contribute to a construction meeting a bronze level of sustainability as defined in this Standard.	
Regulation:	12	Building standards applicable to conversions
Comments made in relation to this system under Regulation 9, Standards 1 to 6 also apply to this Regulation, with reference to clause 0.12.1 ⁽¹⁾⁽²⁾ and Schedule 6 ⁽¹⁾⁽²⁾ .		
(1) Technical Handbook (Domestic).		
(2) Technical Handbook (Non-Domestic).		



The Building Regulations (Northern Ireland) 2012

Regulation:	23(a)(i)(iii)(b)	Fitness of materials and workmanship
Comment:	The system is acceptable. See section 12 and the <i>Installation</i> part of this Certificate.	
Regulation:	28	Resistance to moisture and weather
Comment:	The system has adequate resistance to the ingress of rain and wind driven spray and so can contribute towards the wall satisfying this Regulation. See section 6 of this Certificate.	
Regulation:	29	Condensation
Comment:	The system will contribute to minimising the risk of interstitial and surface condensation. See section 9 of this Certificate.	
Regulation:	39(a)(i)	Conservation measures
Regulation:	40(2)	Target carbon dioxide emission rate
Comment:	The system can contribute to minimising heat loss at lintels, jambs and cills. See sections 7 and 8 of this Certificate.	

Information in this Certificate may assist the client, CDM co-ordinator, designer and contractors to address their obligations under these Regulations.

See sections:

3 *Delivery and site handling* and 14 *Precautions of this Certificate*.

Additional Information

NHBC Standards 2014

NHBC accepts the use of the illbruck i3 System (illbruck ME500 or ME501 Duo Window Membranes — External Weather Seal, illbruck FM230 Pro Foam Window — Middle Insulation Seal, illbruck ME500 or ME501 Duo Window Membrane — Internal Airtight Seal), provided it is installed, used and maintained in accordance with this Certificate, in relation to *NHBC Standards*, Chapter 6.1 *External masonry walls* and Chapter 6.7 *Doors, windows and glazing*.

Technical Specification

1 Description

1.1 The illbruck i3 System (illbruck ME500 or ME501 Duo Window Membranes — External Weather Seal, illbruck FM230 Pro Foam Window — Middle Insulation Seal, illbruck ME500 or ME501 Duo Window Membrane — Internal Airtight Seal) comprises the following components:

- illbruck ME500 Duo Flexible Window Membrane — a dark grey polyethylene copolymer film with non-woven fleece fabric and acrylic and butyl self-adhesive strips, used to provide an external weathertight and internal airtight seal. illbruck ME500 Duo Flexible Window Membrane is available in two options:
 - illbruck ME500 Duo 'W' Flexible Window Membrane — acrylic and butyl self-adhesive strips pre-applied on two parallel edges, on opposite faces of the membrane. This option is used for application before fixing of the window (or door). This membrane is also available with gasket
 - illbruck ME500 Duo 'E' Flexible Window Membrane — acrylic and butyl self-adhesive strips pre-applied on two parallel edges on the same face of the membrane. This option is used for application after fixing of the window (or door)
- illbruck FM230 Pro Foam Window — a white, one-component, polyurethane foam, dispensed in situ from a CFC/HCFC-free aerosol canister which expands to fill and seal the gaps. The foam cures through the absorption of atmospheric moisture and is designed to provide sound and thermal insulation
- illbruck ME501 Duo Window Membrane HD — a black polyethylene copolymer film with non-woven fleece fabric, available with a plaster mesh finish or with gasket options, used to provide an external weathertight or internal airtight seal with greater strength and extended UV stability. The membrane is attached to the window with SP525 adhesive or gasket and to the construction reveal material with SP525 adhesive
- ME901 Butyl & Bitumen Primer — a brush-applied polymer solution for use with illbruck butyl and bitumen tapes and membranes
- ME902 Butyl & Bitumen Spray Primer — a spray-applied polymer solution for use with illbruck butyl and bitumen tapes and membranes
- SP525 adhesive — a low modulus sealant formulated using advanced SP polymer technology, available in white, light grey, mid-grey, concrete grey, anthracite, black, Portland (light sandstone) and sandstone colours.

1.2 When combined in the illbruck i3 System the components can provide an external weathertight seal, an internal airtight seal and intermediate insulation.

1.3 illbruck ME500 and ME501 Duo membranes are supplied in rolls to the dimensions given in Table 1.

Table 1 illbruck ME500 and ME501 Duo dimensions⁽¹⁾

Membrane	Width ⁽¹⁾ (mm)	Length (m)
illbruck ME500 Duo 'W' Flexible Window Membrane	60–80 80–110 110–140	50
illbruck ME500 Duo 'E' Flexible Window Membrane	80–110 110–140 140–170	
illbruck ME501 Duo HD Window Membrane	Slit to width 150 300	

(1) Alternative roll widths are available on special order from the Certificate holder.

1.4 illbruck ME500 Duo Flexible 'W' and 'E' and ME501 Duo HD Window Membranes are also available with a plaster mesh finish for use in situations where a wet render or wet plaster finish is to be applied. This variation is outside the scope of this Certificate. Further advice on use and application should be sought from the Certificate holder.

1.5 illbruck FM230 Pro Foam Window is supplied in 750 ml canisters. An approximate guide to the number of linear metres each canister should yield is given in Table 2.

Table 2 Approximate yield⁽¹⁾ (m) of a 750 ml canister with gap width and depth

Gap depth (mm)	Gap width (mm)				
	10	20	30	40	50
10	280	140	93	70	56
20	140	70	46	35	28
30	93	46	31	23	18
40	70	35	23	17	14
50 ⁽²⁾	56	28	18	14	11

(1) Yields can vary according to prevailing temperatures and humidity conditions, and can be increased by wetting of the joint prior to application, and when applying between multiple layers.

(2) For gaps deeper than 50 mm the material should be applied in layers. Each layer must be fully cured before further applications are made.

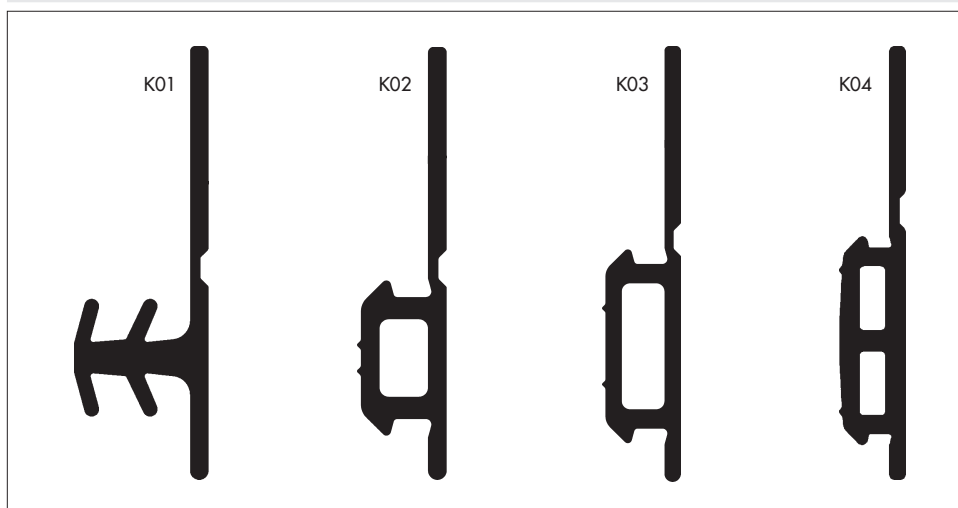
Gaskets

1.6 Four gasket options are available, the use of which is dependent on a suitable groove on the frame profile (see Table 3 and Figure 1). The gasket option of illbruck ME501 Duo Window Membrane HD is fixed to the construction material using SP525 Adhesive as in the previous application details above.

Table 3 Gasket type

Gasket type	Minimum groove depth (approx) (mm)	Groove width (approx) (mm)
K01	6.5	3–5
K02	4.0	5–7
K03	4.0	7–10
K04	4.0	13–15

Figure 1 Gasket options



Adhesive

1.7 Typical coverage rates for SP525 Adhesive are shown in Table 4.

Table 4 Adhesive coverage rates

Width x depth (mm)	Linear metres per 600 ml foil	Linear metres per 400 ml foil
6 x 6	16.7	11.1
10 x 6	10.1	6.7
10 x 10	3.0	2.0
20 x 10	2.0	1.3
Fillet joint width x depth (mm)		
6 x 6	33.3	22.2
10 x 10	12.0	8.0

1.8 Ancillary items for use with the system include:

- illbruck AA290 PU foam cleaner — used to clean the application gun for illbruck FM230 Pro Foam Window
- application gun — for use in applying illbruck FM230 Pro Foam Window. For apertures less than 10 mm a special adaptor is available from the Certificate holder.

2 Manufacture

2.1 As part of the assessment and ongoing surveillance of product quality, the BBA has:

- agreed with the manufacturer the quality control procedures and product testing to be undertaken
- assessed and agreed the quality control operated over batches of incoming materials
- monitored the production process and verified that it is in accordance with the documented process
- evaluated the process for management of nonconformities
- checked that equipment has been properly tested and calibrated
- undertaken to carry out the above measures on a regular basis through a surveillance process, to verify that the specifications and quality control operated by the manufacturer are being maintained.

2.2 The management system of Tremco illbruck Ltd has been assessed and registered as meeting the requirements of BS EN ISO 9001 : 2008 by TÜV Rheinland Industrie Service GmbH (Certificate No. 01 100 4301) for the Bodenwöhr, Germany location, and by DNV (Certificate No. 129929-2013-AQ-NLD-RvA) Arkel, for the Netherlands location.

3 Delivery and site handling

3.1 illbruck ME500 Duo Flexible Membranes are supplied in cartons, containing 2–6 rolls depending upon the roll width, bearing the Certificate holder's name and width of membrane. The membranes should be stored in their original containers in a cool, dry place and must not be exposed to sources of heat or high temperatures.

3.2 illbruck FM230 Pro Foam Window is supplied in 750 ml canisters (12 per package) The application guns are packed separately and individually. The foam must be stored vertically (nozzle up) in temperatures between 5°C and 25°C in well-ventilated areas and has a shelf-life of nine months. The foam canisters must not be exposed to temperatures in excess of 50°C, direct sunlight or the danger of impact.

3.3 illbruck FM230 Pro Foam Window has a flashpoint of <0°C and is classified as 'harmful' and 'extremely flammable' under *The Chemicals (Hazard Information and Packaging for Supply) Regulations 2009 (CHIP4)/Classification, Labelling and Packaging of Substances and Mixtures (CLP Regulation) 2009*, and all containers bear the appropriate hazard warning labels.

3.4 illbruck ME501 Duo HD Window Membrane is supplied in cartons, containing 1-2 rolls depending upon the roll width, bearing the Certificate holder's name and width of membrane. The membrane should be stored in its original container in a cool, dry place and must not be exposed to sources of heat or high temperatures.

3.5 illbruck ME901 Primer is supplied in 1 litre (12 per carton) and 5 litre tins, and illbruck ME902 Primer in 500 ml aerosol cans (12 per carton). Both primers are classified as 'flammable' under *The Chemicals (Hazard Information and Packaging for Supply) Regulations 2009 (CHIP4)/Classification, Labelling and Packaging of Substances and Mixtures (CLP Regulation) 2009*.

3.6 illbruck SP525 adhesive is supplied in 400 ml and 600 ml foils (20 per carton).

Assessment and Technical Investigations

The following is a summary of the assessment and technical investigations carried out on the illbruck i3 System (illbruck ME500 or ME501 Duo Window Membranes — External Weather Seal, illbruck FM230 Pro Foam Window — Middle Insulation Seal, illbruck ME500 or ME501 Duo Window Membrane — Internal Airtight Seal).

Design Considerations

4 Use

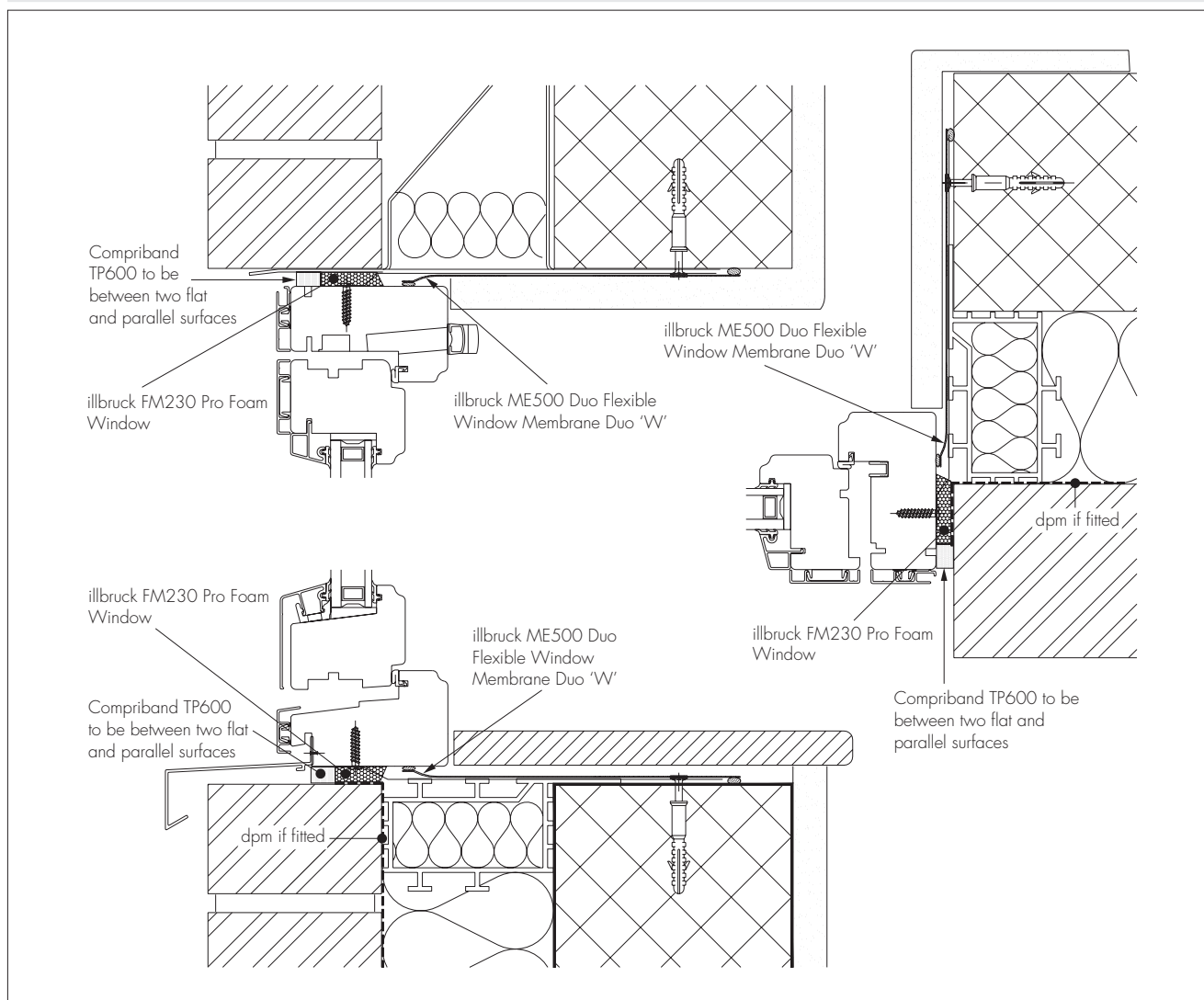
4.1 The illbruck i3 System (illbruck ME500 or ME501 Duo Window Membranes — External Weather Seal, illbruck FM230 Pro Foam Window — Middle Insulation Seal, illbruck ME500 or ME501 Duo Window Membrane — Internal Airtight Seal) is satisfactory for use in providing a weathertight and airtight seal and thermal and acoustic insulation around newly-installed window and door frames within structural units of timber, plastics, masonry, metal or concrete, in new build or renovation situations.

4.2 When used and installed in accordance with this Certificate and the Certificate holder's instructions, the system can contribute towards an exterior building envelope meeting a minimum air leakage of less than $1 \text{ m}^3 \cdot \text{hr}^{-1} \cdot \text{m}^{-2} @ 50 \text{ Pa}$ (see below, Figure 2 and section 7).

- wall structure — double-shell wall construction consisting of a sand-lime brickwork with approximately 4 cm core insulation and a brick front wall with external rebate
- window — wooden window (IV 68) with Uniphon 38/51 (13GH/16/96H) from the Uniglas group
- seal on room side — illbruck ME500 Duo Flexible Window Membrane 150 mm

- joint filler — illbruck FM230 Window Seal Foam
- external seal side and top, below window cill — Compriband TP600 20/10-18 grey; illbruck ME500 Duo Flexible Window Membrane 150 mm.

Figure 2 Typical installation detail



5 Practicability of installation

The system is designed to be installed by a competent general builder or contractor.

6 Weathertightness



When tested in accordance to BS EN 1027 : 2000 no detectable water or moisture penetration occurred up to a test pressure of 600 Pa, and therefore the system can satisfy the Class 9A requirements of BS EN 12208 : 2000.

7 Air barrier continuity



When correctly installed the system acts as an air barrier and can contribute to elements and junctions minimising heat loss by unplanned air infiltration. The system described in section 4.2 has been tested according to BS EN 1026 : 2000 and classified according to BS EN 12207 : 1999, and achieves a typical air infiltration, Q_{100} of $0.1 \text{ m}^3 \cdot \text{hr}^{-1} \cdot \text{m}^{-1}$, Class 4. Guidance documents in this respect are referenced in section 8 of this Certificate.

8 Thermal performance



When used in conjunction with a suitable cavity closer with a minimum resistance path of at least $0.45 \text{ m}^2 \cdot \text{K} \cdot \text{W}^{-1}$ the system can contribute to a lintel, jamb or a cill meeting the requirements of the Accredited Construction Details. Detailed guidance on limiting heat loss and air infiltration can be found in:

England and Wales — Approved Documents to Part L and, for new thermal elements to existing buildings, Accredited Construction Details (Version 1.0). See also SAP 2009 *The Government's Standard Assessment Procedure for Energy Rating of Dwellings*, Appendix K and the *iSBEM User Manual* for new-build.

Scotland — Accredited Construction Details (Scotland)

Northern Ireland — Accredited Construction Details (Version 1.0).

9 Risk of condensation

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

10 Acoustic performance

The system will reduce flanking sound but the effect will be dependent upon the construction.

11 Maintenance

As the system is confined within the final construction and has suitable durability (see section 12), maintenance is not required.

12 Durability



The system will be virtually unaffected by the normal conditions found during installation and will have a life comparable with that of the installed window or door frame, provided it is not exposed to sunlight for long periods (see section 13.3). Advice regarding the exposure period of illbruck ME500 and ME501 Duo Window Membranes can be obtained from the Certificate holder.

Installation

13 General

13.1 Installation of the illbruck i3 System (illbruck ME500 or ME501 Duo Window Membranes — External Weather Seal, illbruck FM230 Pro Foam Window — Middle Insulation Seal, illbruck ME500 or ME501 Duo Window Membrane — Internal Airtight Seal) must be carried out in accordance with the Certificate holder's instructions.

13.2 The choice of illbruck ME500 Duo Flexible Window Membrane 'W' or 'E' depends on whether the frame is already fitted or is to be fitted into the reveal or a projecting window detail. Any of the illbruck ME500 Duo 'W' and Duo 'E' Flexible Window Membranes or ME501 Duo Window Membrane HD may be used in conjunction when installing a frame. In case of doubt, advice should be sought from the Certificate holder.

13.3 The exposed side of the external membrane of illbruck ME500 Duo Flexible Window Membrane must be covered as soon as possible to protect it from UV, normally by an insulated cladding system. Alternatively illbruck ME501 Duo HD Window Membrane may be used externally to provide greater strength and UV stability. Advice can be sought from the Certificate holder.

14 Precautions

14.1 illbruck FM230 Pro Foam Window contains diphenylmethane-4,4'-diisocyanate, which may cause sensitisation and irritation to the respiratory system, eyes and skin. Vapours from the foam are heavier than air and will tend to move to the lowest point. The foam must only be used in well-ventilated areas to prevent the build-up of vapours. Where sufficient ventilation is unavailable, suitable respiratory equipment must be used.

14.2 The propellant is flammable (see section 3.3), and care must therefore be taken to ensure that the vapour does not come into contact with sparks or naked flames during installation.

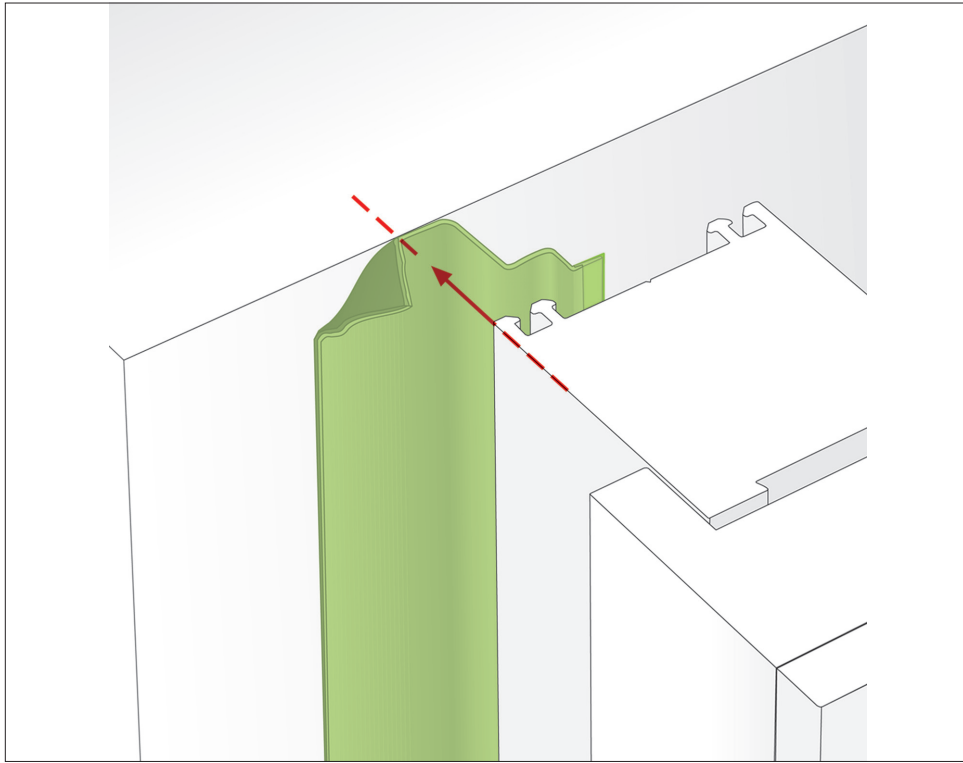
14.3 Surrounding decorated areas must be protected from accidental spills as the cured foam can only be removed mechanically.

14.4 During application and other procedures before the foam has cured, appropriate personal protective equipment must be worn (eye and hand protection).

15 Application of illbruck ME500 Duo 'W' Flexible Window Membrane

15.1 illbruck ME500 Duo 'W' Flexible Window Membrane is installed before fitting the frame into the reveal. The membrane is bonded to the inner edge of the window frame using the acrylic self-adhesive strip, starting from the bottom centre of the frame, ensuring that the expansion pleat fold line is in line with the inner edge/face junction of the frame (see Figure 3).

Figure 3 Application of illbruck ME500 Duo 'W' Flexible Window Membrane



15.2 At each corner the membrane is bent and folded against itself, ensuring that the acrylic self-adhesive strip is back-to-back, leaving an extra 20 mm length (40 mm of membrane) protruding out from all four corners.

15.3 Application is continued around the frame, with the acrylic self-adhesive strip applied to all sides and with an overlap of 50 mm at the bottom centre of the frame.

15.4 Application of the membrane is repeated for the outer edge/face junction of the frame, as described in sections 15.1 to 15.3, before attachment of the fixing brackets to the edge of the frame over the membranes and fitment of the frame into the reveal, ensuring that the membranes protrude across the internal and external reveals.

15.5 On damp, dusty or undulating surfaces, or if the ambient temperature is below 5°C, use of illbruck ME901 or illbruck ME902 Butyl and Bitumen Primer is required.

15.6 The membrane is bonded to the substrate of the reveal with the butyl strip and a seam roller is used to consolidate the bond.

15.7 All membrane lap joints and areas of potential water ingress or air leakage (corners, around fixing brackets, etc) must be further sealed with Tremco SP525.

15.8 Application of illbruck FM230 Pro Foam Window is carried out in accordance with section 17 and before bonding the internal butyl strip of illbruck ME500 Duo 'W' Flexible Window Membrane to the substrate, in accordance with sections 15.5 to 15.7 and the Certificate holder's instructions.

16 Application of illbruck ME500 Duo 'E' Flexible Window Membrane

16.1 illbruck ME500 Duo 'E' Flexible Window Membrane is bonded to the installed frame's face (internal or external depending on location) using the acrylic self-adhesive strip, with a minimum 10–15 mm contact area (see Figure 4), ensuring that this will be subsequently covered by finishes, eg dry lining, cladding, render, etc.

16.2 Application is continued around corners, carefully folding to ensure continuity of the membrane, ensuring that no radii are present at the corner interface with the internal blockwork or other construction material.

16.3 The membrane may also be applied as individual strips to each side of the frame allowing a 50 mm overlap of the membrane at the corners.

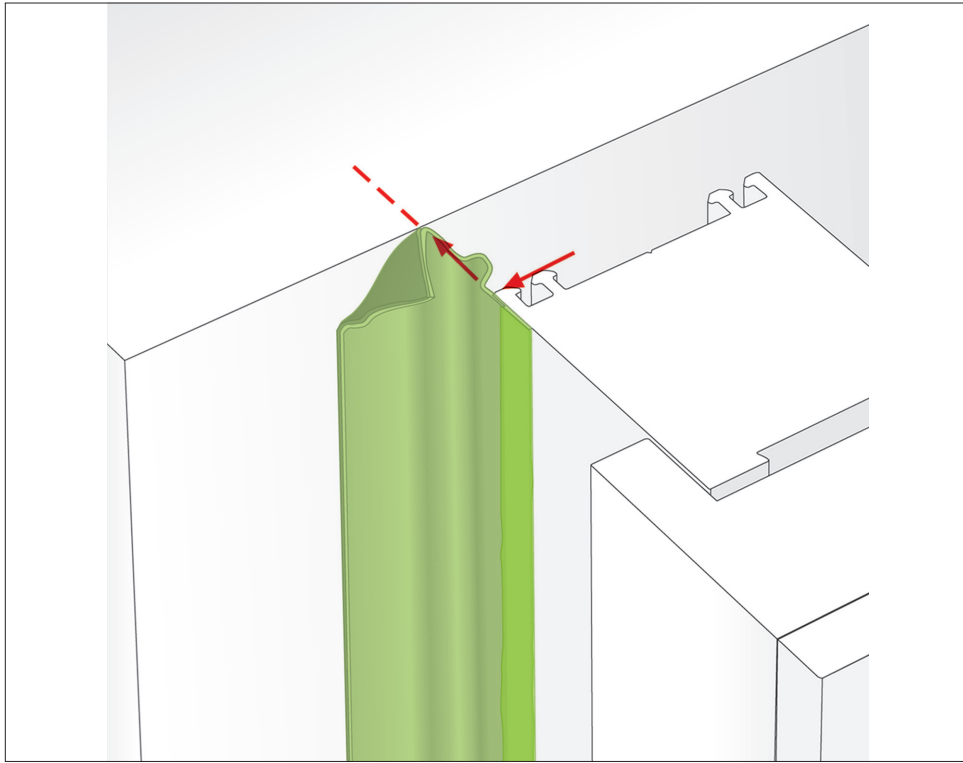
16.4 On damp, dusty or undulating surfaces, or if the ambient temperature is below 5°C, use of illbruck ME901 or illbruck ME902 Butyl and Bitumen Primer is required.

16.5 The external membrane is bonded to the substrate of the reveal using the butyl strip and a seam roller is used to consolidate the bond.

16.6 All lap joints and areas of potential water ingress or air leakage (corners, around fixing brackets, etc) must be sealed with Tremco SP525.

16.7 Application of illbruck FM230 Pro Foam Window is carried out in accordance with section 17 and before bonding the membrane internally to the frame and substrate, following the procedure described in sections 16.1 to 16.6 and the Certificate holder's instructions.

Figure 4 Application of illbruck ME500 Duo 'E' Flexible Window Membrane



17 Application of illbruck FM230 Pro Foam Window

17.1 The canister must be shaken thoroughly for approximately two minutes to mix contents before use, and shaken occasionally during use. The canister must always be inverted during use.

17.2 The application gun is screwed into the canister in accordance with the separate gun instructions. The gun is directed into a suitable waste container (eg carton or plastic bag) and the trigger pulled to charge the gun and dispense the foam.

17.3 The flow of foam is regulated using the trigger and can be controlled using the flow adjustment screw.

17.4 As the foam is applied, from the bottom of vertical joints, working upwards, the gap must be filled to approximately 75–80% of its depth to accommodate post expansion of the foam. Deep gaps should be filled in two or more applications. Curing may be accelerated by wetting the contact surface immediately prior to application. When applying several layers, each cured layer must be moistened before application of the next.

17.5 Once illbruck FM230 Pro Foam Window has cured (typically 60–120 minutes depending on temperature and relative humidity) no excess cured foam should protrude from the gap. Any material must be trimmed off flush with the internal window frame face.

17.6 Uncured foam is removed from the gun using illbruck PU foam cleaner sprayed onto a cloth.

17.7 Empty canisters are removed by holding them upright and unscrewing.

17.8 Uncured foam is removed from the threaded collar using the foam cleaner. The inside of the gun can also be cleaned at this stage, by screwing the gun to the foam cleaner canister and following the instructions printed on it. A new foam canister should be fitted immediately and the gun charged as described in section 17.2.

17.9 The flow adjustment screw must be turned fully clockwise when the gun is not in use. The gun must always be stored fully charged with foam and attached to a full or partially-full canister of foam.

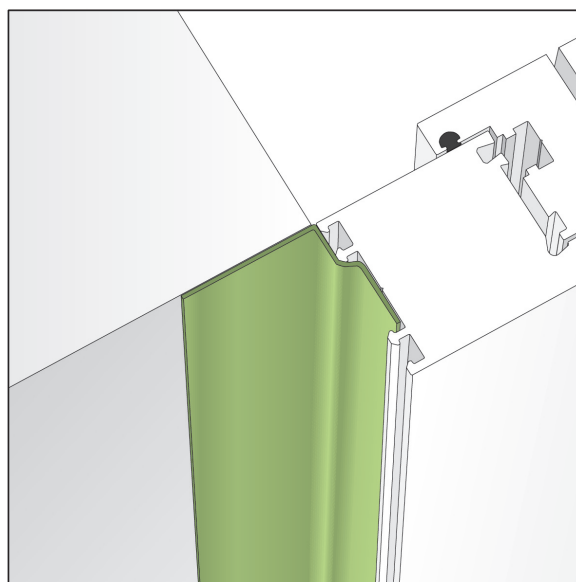
18 Application of illbruck ME501 Duo Window Membrane HD

18.1 illbruck ME501 Duo Window Membrane HD is attached to the window with SP525 adhesive or gasket and to the construction reveal material with SP525 adhesive (see Figure 5).

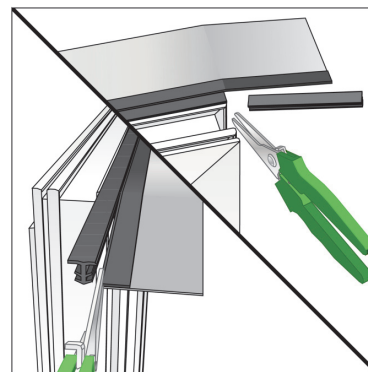
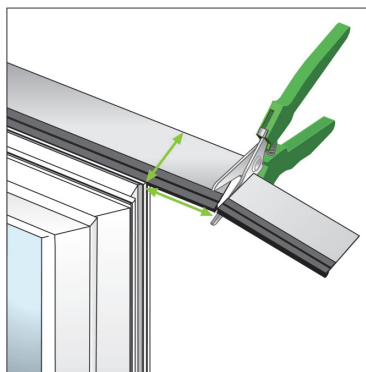
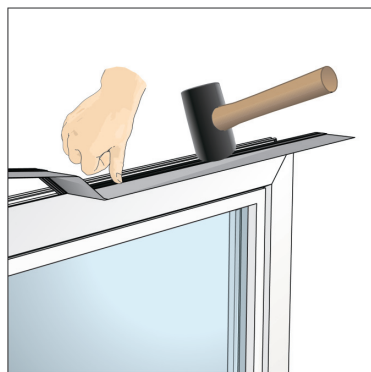
Figure 5 Installation of illbruck ME501 with SP525 adhesive or gasket



illbruck ME501 bonded to face of window frame and wall with SP525 adhesive



illbruck ME501 bonded to edge of window frame and wall with SP525 adhesive



illbruck ME501 attached to window frame with gasket, locate gasket into groove using mallet

Bonding with SP525 Adhesive after frame installation (suitable for single windows and curtain walling/multiple coupled windows) (see Figure 5)

18.2 A 10 mm diameter bead of Tremco SP 525 adhesive is applied approximately 15 mm from one edge of the back (shiny) face of the membrane, and bonded to the window frame face or edge by compressing with a seam roller to consolidate the bond.

18.3 A similar bead of adhesive is applied to the opposite edge of the membrane and bonded to the substrate by compressing with a seam roller to consolidate the bond.

Gasket option

18.4 The membrane with gasket is fixed to the substrate using Tremco SP525 Adhesive as in previous applications above.

18.5 When using the gasket fixing option, if the frame is being installed into a reveal the membrane must be applied prior to installation. If installing where the frame projects forward of the opening, the membrane can be applied after installation.

18.6 If a wet render system is to be used, this must be applied to the non-shiny face of the membrane. For large areas and improved adhesion of the wet finish, a plaster mesh version of illbruck ME501 Duo Window Membrane HD must be used. Further details are available from the Certificate holder.

19 Application of illbruck ME901 and ME902 Butyl & Bitumen Primers

19.1 The primers must be used above -5°C

19.2 The primers must be applied evenly and carefully on dry, dust-free and grease-free surfaces. Adjoining surfaces must be masked if not to be primed.

19.3 Coverage will depend on the porosity of the substrate.

20 Application of SP525 adhesive

20.1 The sealant must be applied between 5°C and 40°C using a conventional applicator gun.

20.2 Joint faces must be clean, dry and free from dust, oil, grease, old sealant and any traces of contaminant which may affect adhesion. Any previously-applied sealant must be mechanically removed.

20.3 All beads must be consolidated by applying pressure along the length of the membrane using a seam roller to ensure firm, full contact with the joint faces.

21 Repair

Any damage to the membranes must be repaired as soon as possible and before the application of the finishing layer(s) of the construction detail. The membranes may be repaired by applying a patch of the membrane over the damaged area and sealing it with Tremco SP525. In case of doubt, advice on a suitable repair method should be sought from the Certificate holder.

Technical Investigations

22 Tests

22.1 Tests were conducted on illbruck ME500 Duo Flexible Window Membrane and the results assessed to determine:

- peel strength
- tear strength
- water vapour permeability
- dimensional stability
- foldability.

22.2 Tests were conducted on illbruck FM230 Pro Foam Window and the results assessed to determine:

- water vapour permeability
- density
- bond strength to various substrates
- cohesive tensile strength
- thermal conductivity.

23 Investigations

23.1 An evaluation was made of independent test data carried out on the i3 System (illbruck ME500 or ME501 Duo Window Membranes — External Weather Seal, illbruck FM230 Pro Foam Window — Middle Insulation Seal, illbruck ME500 or ME501 Duo Window Membrane — Internal Airtight Seal) relating to:

- air permeability
- resistance to driving rain
- simulated short-term loading
- sound reduction.

23.2 An evaluation was made of independent test data carried out on illbruck ME500 Duo Flexible Window Membrane relating to:

- adhesive tensile strength
- resistance to fire.

23.3 An evaluation was made of independent test data carried out on illbruck FM230 Pro Foam Window relating to:

- sound reduction in joints
- thermal conductivity
- flexibility at 0°C and 23°C
- cure rates at 0°C and 23°C.

23.4 An evaluation was made of independent test data carried out on illbruck ME501 Duo HD Window Membrane relating to:

- air permeability
- adhesive tensile strength
- resistance to fire.

23.5 An evaluation was made of independent test data carried out on illbruck SP525 Adhesive relating to adhesive tensile strength.

23.6 Using computer modelling, window and door frame jambs were analysed for risk of condensation.

23.7 Visits were made to a site in progress to assess the practicability of installation.

23.8 The manufacturing process was evaluated, including the methods adopted for quality control, and details were obtained of the quality and composition of the materials used.

Bibliography

BS EN 1026 : 2000 *Windows and doors — Air permeability — Test method*
BS EN 1027 : 2000 *Windows and doors — Watertightness — Test method*
BS EN 12207 : 1999 *Windows and doors — Air permeability — Classification*
BS EN 12208 : 2000 *Windows and doors — Watertightness — Classification*
BS EN ISO 9001 : 2008 *Quality management systems — Requirements*

Conditions of Certification

24 Conditions

24.1 This Certificate:

- relates only to the product/system that is named and described on the front page
- is issued only to the company, firm, organisation or person named on the front page — no other company, firm, organisation or person may hold or claim that this Certificate has been issued to them
- 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.

24.2 Publications, documents, specifications, legislation, regulations, standards and the like referenced in this Certificate are those that were current and/or deemed relevant by the BBA at the date of issue or reissue of this Certificate.

24.3 This Certificate will remain valid for an unlimited period provided that the product/system and its manufacture and/or fabrication, including all related and relevant parts and 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.

24.4 The BBA has used due skill, care and diligence in preparing this Certificate, but no warranty is provided.

24.5 In issuing this Certificate, the BBA is not responsible and is excluded from any liability to any company, firm, organisation or person, for any matters arising directly or indirectly from:

- 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
- actual installations of the product/system, including their nature, design, methods, performance, workmanship and maintenance
- any works and constructions in which the product/system is installed, including their nature, design, methods, performance, workmanship and maintenance
- any loss or damage, including personal injury, howsoever caused by the product/system, including its manufacture, supply, installation, use, maintenance and removal
- any claims by the manufacturer relating to CE marking.

24.6 Any information relating to the manufacture, supply, installation, use, maintenance and removal 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, maintained and removed. It does not purport in any way to restate the requirements of the Health and Safety at Work etc. Act 1974, or of any other statutory, common law or other duty which may exist at the date of issue or reissue 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.