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BBA APPROVAL INSPECTION TESTING CERTIFICATION
TECHNICAL APPROVALS FOR CONSTRUCTION

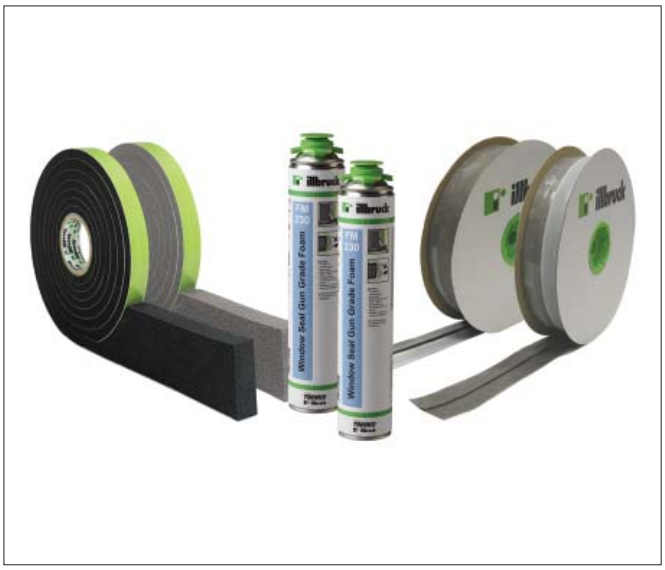
Agrément Certificate
12/4891
Product Sheet 1

TREMCO iLLBRUCK WINDOW AND DOOR PRODUCTS

iLLBRUCK i3 SYSTEM (COMPRIBAND TP600 — EXTERNAL WEATHER SEAL, iLLBRUCK FM230 WINDOW SEAL FOAM — MIDDLE INSULATION SEAL, iLLBRUCK ME500 DUO FLEXIBLE WINDOW MEMBRANE — INTERNAL AIRTIGHT SEAL)

PRODUCT SCOPE AND SUMMARY OF CERTIFICATE

This Certificate relates to the illbruck i3 System (Compriband TP600 — External Weather Seal, illbruck FM230 Window Seal Foam — Middle Insulation Seal, illbruck ME500 Duo Flexible Window Membrane — Internal airtight seal), for use around windows and doors to provide a weathertight external seal, an internal airtight seal and thermal and acoustic insulation.



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

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 sills according to the Accredited Construction Details, Version 1.0 (England, Wales and Northern Ireland) and ACD's (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 — when installed the 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 Agrément 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 First issue: 13 February 2012

Simon Wroe
Head of Approvals — Materials

Greg Cooper
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 (Compriband TP600 — External Weather Seal, illbruck FM230 Window Seal Foam — Middle Insulation Seal, illbruck ME500 Duo Flexible Window Membrane — Internal airtight seal), 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 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)

Requirement:	C2(b)	Resistance to moisture
Comment:		The system will contribute to an installation meeting this Requirement. See section 6.1 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 sills. See sections 7 and 8 of this Certificate.
Requirement:	Regulation 7	Materials and workmanship
Comment:		The materials are acceptable. See section 12 and the *Installation* part of this Certificate.

The Building (Scotland) Regulations 2004 (as amended)

Regulation:	8(1)	Fitness and durability of materials and workmanship
Comment:		The use of the system satisfies the requirements of this Regulation. See section 12 and the *Installation* part of this Certificate.
Regulation:	9	Building standards — 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 6.1 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:	6.1(b)	Carbon dioxide emissions
Standard:	6.2	Building insulation envelope
Comment:		The system can contribute to minimising heat loss at lintels, jambs and sills. 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 — conversions
Comment:		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) 2000 (as amended)

Regulation:	B2	Fitness of materials and workmanship
Comment:		The system is acceptable. See section 12 and the *Installation* part of this Certificate.
Regulation:	C4(b)	Resistance to ground moisture and weather
Comment:		The system will contribute to a wall satisfying this Regulation. See section 6.1 of this Certificate.
Regulation:	C5	Condensation
Comment:		The system will contribute to minimising the risk of interstitial and surface condensation. See section 9 of this Certificate.
Regulation:	F2(a)(i)	Conservation measures
Regulation:	F3(2)	Target carbon dioxide Emissions Rate
Comment:		The system can contribute to minimising heat loss at lintels, jambs and sills. See sections 7 and 8 of this Certificate.

Construction (Design and Management) Regulations 2007

Construction (Design and Management) Regulations (Northern Ireland) 2007

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* (3.2 and 3.3) and 14 *Precautions* (14.1 to 14.4) of this Certificate.

Additional Information

NHBC Standards 2011

NHBC accepts the use of the illbruck i3 System (Compriband TP600 — External Weather Seal, illbruck FM230 Window Seal Foam — Middle Insulation Seal, illbruck ME500 Duo Flexible Window Membrane — Internal airtight seal), when installed and used 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 (Compriband TP600 — External Weather Seal, illbruck FM230 Window Seal Foam — Middle Insulation Seal, illbruck ME500 Duo Flexible Window Membrane — Internal airtight seal) comprises the following components:

- Compriband TP600 — a sealing tape manufactured from blocks of soft polyurethane foam impregnated with a flame-retardant synthetic resin and an adhesive layer applied to one side protected by a silicone release paper to aid installation. The impregnated foam is then compressed by approximately 85% before forming into rolls, and cutting to the required length and width. When fitted in a joint the tape re-expands to fill and seal the joint. To provide a weathertight seal the optimum final compression is 20% of the fully expanded thickness
- illbruck FM230 Window Seal Foam — a white, one-component, polyurethane foam, dispensed in-situ from a CFC/HCFC-free aerosol canister which expands to fill and seal gaps. The foam cures through the absorption of atmospheric moisture and is designed to provide sound and thermal insulation
- illbruck ME500 Duo Flexible Window Membrane — a polyethylene copolymer film with woven fleece fabric, acrylic self-adhesive and butyl adhesive strips used to provide an internal airtight seal. illbruck ME500 Duo Flexible Window Membranes are available in two different options:
  - illbruck ME500 Duo 'W' Flexible Window Membrane — acrylic and butyl self-adhesive strips pre-applied on two parallel edges, on opposite faces of membrane. This option is used for application before fixing of window (or door)
  - illbruck ME500 Duo 'E' Flexible Window Membrane — acrylic and butyl self-adhesive strips pre-applied on two parallel edges on the same face of membrane. This option is used for application after fixing of window (or door).

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

1.3 Compriband TP600 is anthracite or grey in colour and has the nominal characteristics of:

Size	Density ($kg \cdot m^{-3}$)
7–12	85–100
8–15 and 13–24	99–121
17–32	108–132
28–40	117–143
Cross-section	various (see Table 1).

Table 1 Compriband TP600 dimensions

Tape size/code no	Suitable joint depth (mm)[1]	Suitable joint width (mm)[2]
10/2	10	2
10/3	10	3
10/3–7	10	3–7
15/3–7	15	3–7
20/3–7	20	3–7
25/3–7	25	3–7
15/5–10	15	5–10
20/5–10	20	5–10
25/5–10	25	5–10
15/8–15	15	8–15
20/8-15	20	8–15
30/8–15	30	8–15
20/10–18	20	10–18
25/10–18	25	10–18
30/10–18	30	10–18
20/13–24	20	13–24
25/13–24	25	13–24
30/13–24	30	13–24
30/17–32	30	17–32
35/17–32	35	17–32
40/28–40	40	28–40

(1) Joint depth defines tape width.

(2) Joint width defines tape height.

1.4 The foam 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

Depth (mm)	Width				
	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, 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.

1.5 The membranes are supplied in roll form (see Table 3).

Table 3 Dimensions[1]

illbruck ME500 Duo 'W' Flexible Window Membrane		illbruck ME500 Duo 'E' Flexible Window Membrane	
Width (mm)	Length (m)	Width (mm)	Length (m)
60–80	50	80–110	50
80–110	50	110–140	50
110–140	50	140–170	50

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

1.6 The membranes are also available in alternative variations to suit different construction practices (outside the scope of this Certificate). Further advice on use and application should be sought from the Certificate holder. Variations include:

- membranes are also available with a plaster mesh finish for uses in situations where a wet render or wet plaster finish is to be applied
- illbruck ME500 Duo 'W' Flexible Window Membrane is also available as a gasket option which replaces the acrylic self-adhesive strip
- illbruck ME501 Duo HD Window Membrane is also available to provide an external weathertight or internal airtight seal with greater strength and extended UV stability. Available with a plaster mesh finish or with gasket options.

1.7 Additional ancillary items available for use with the system include:

- illbruck ME901 (brushable version) or illbruck ME902 (aerosol sprayable version) Butyl and Bitumen Primer — for use to enhance adhesion of the butyl strip on dusty or damp substrates or where the ambient temperature is below 5°C
- Tremco SP525 — one part, low modulus, hybrid polymer, elastomeric sealant used to seal lap joints of the ME500 Duo Flexible Window Membrane and any areas of potential weather ingress or air leakage paths
- illbruck AA290 PU Foam Cleaner — used to clean the application gun for the illbruck FM230 Window Seal Foam
- application gun — for use in applying the illbruck FM230 Window Seal Foam. For apertures less than 10 mm a special adaptor is available from the Certificate holder.

2 Manufacture

To ensure product quality is consistently maintained to the required specification, the BBA has:

- agreed with the Certificate holder/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 as part of a surveillance process to ensure that standards are maintained and that the product or system remains as Certificated.

3 Delivery and site handling

3.1 Compriband TP600 is supplied in pre-compressed rolls, interleaved between silicone release paper. Tapes are delivered in cartons (the contents vary according to size of tapes) bearing the manufacturer's name and a detailed description of the contents. Tapes should be stored horizontally in cool, dry conditions in the original packaging; excessive weight must not be placed on the cartons.

3.2 The illbruck FM230 Window Seal Foam is delivered to site in packages of 12 by 750 ml canisters, 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 should not be exposed to temperatures in excess of 50°C, direct sunlight or to the danger of impact.

3.3 The illbruck FM230 Window Seal Foam 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 Regulations) 2009*, and all containers bear the appropriate hazard warning labels.

3.4 The illbruck ME500 Duo Flexible Window Membranes are supplied as 2–6 rolls per carton, depending upon the width, bearing the manufacturer's name and width of membrane. The membranes should be stored in their original containers in a cool dry place and should not be exposed to sources of heat or high temperatures.

Assessment and Technical Investigations

The following is a summary of the assessment and technical investigations carried out on the illbruck i3 System (Compriband TP600 — External Weather Seal, illbruck FM230 Window Seal Foam — Middle Insulation Seal, illbruck ME500 Duo Flexible Window Membrane — Internal airtight seal).

Design Considerations

4 Use

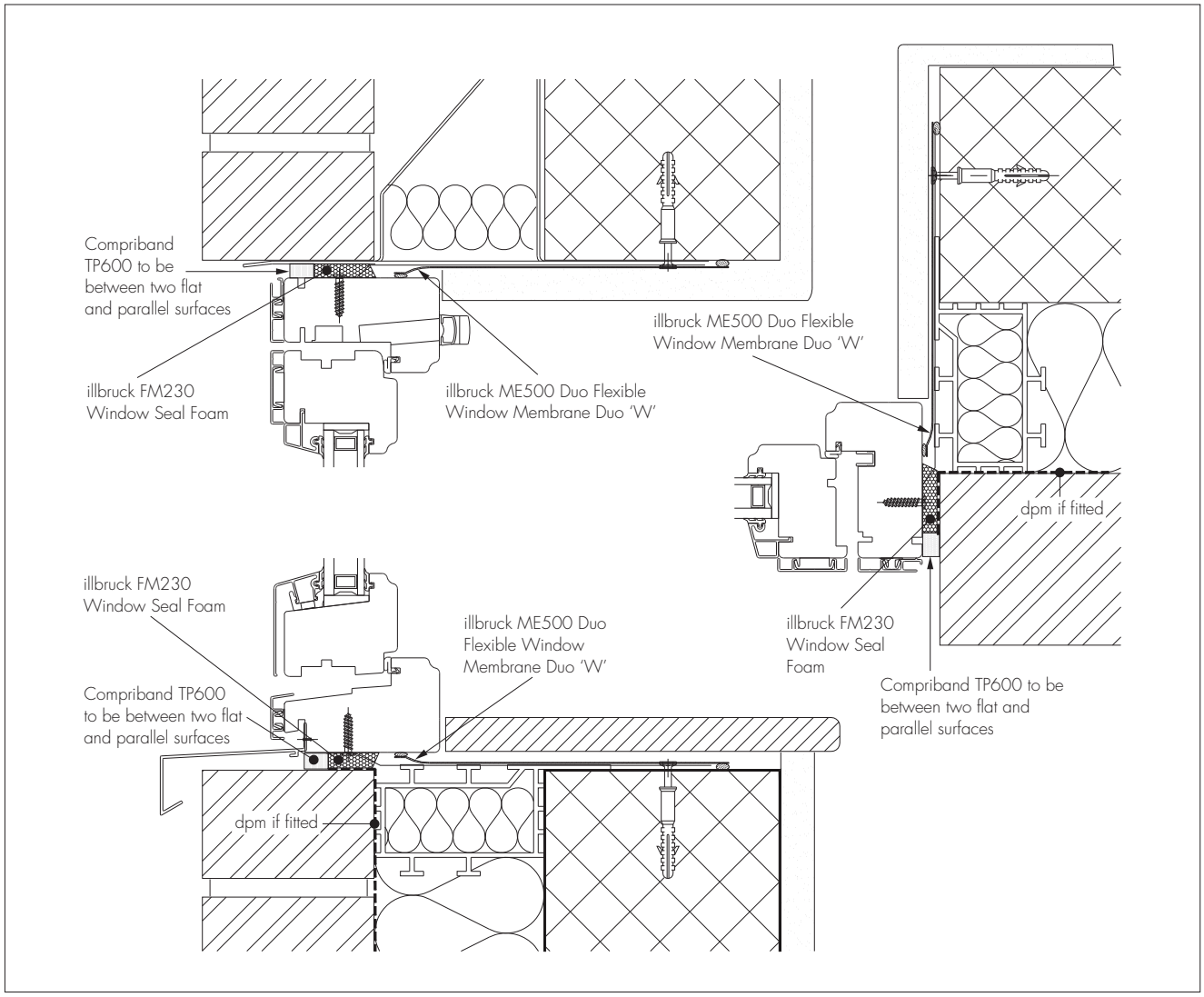
4.1 The illbruck i3 System (Compriband TP600 — External Weather Seal, illbruck FM230 Window Seal Foam — Middle Insulation Seal, illbruck ME500 Duo Flexible Window Membrane — Internal airtight seal) is satisfactory for use to provide a weathertight and airtight seal and thermal and acoustic insulation 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 $m^3 \cdot hr^{-1} \cdot m^{-2}$ @ 50 Pa (see section 7, Table 4 and Figure 1).

Table 4 Assessed installation detail

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 sill	Compriband TP600 20/10-18 grey; illbruck ME500 Duo Flexible Window Membrane 150 mm

Figure 1 Typical installation details



5 Practicability of installation

The products are designed to be installed by a competent general builder or contractor.

6 Weathertightness

6.1 To achieve optimal resistance to water penetration, the exterior sealing tape should be used under 80% compression.

6.2 The exterior sealing tape is not designed to withstand a head of water; in these situations the advice of the Certificate holder must be sought.

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 Table 4 has been tested and classified according to EN 1026 : 2000 and EN 12207 : 1999 respectively, and achieves a typical air infiltration, Q_{100} of 0.1 $m^3 \cdot hr^{-1} \cdot m^{-1}$, 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 $m^2 \cdot K \cdot W^{-1}$ the system can contribute to a lintel, jamb or a sill 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 products 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 when properly specified and installed will have a life comparable with that of the installed window or door frame.

Installation

13 General

13.1 Installation of the illbruck i3 System (Compriband TP600 — External Weather Seal, illbruck FM230 Window Seal Foam — Middle Insulation Seal, illbruck ME500 Duo Flexible Window Membrane — Internal airtight seal) must be carried out in accordance with the Certificate holder's instructions.

13.2 Compriband TP600 may be installed in all conditions likely to occur in practice; however care should be taken when used at lower ambient temperature (see section 15.4).

14 Precautions

14.1 The illbruck FM230 Window Seal Foam 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), therefore care must be taken to ensure 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 mechanically removed.

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 Compriband TP600

15.1 The dimensions of the joint to be filled govern the size of tape used, however the depth of the joint must not be less than the width of the tape and the expanded tape thickness must not be greater than the tape width unless the thickness dimension is supported on at least one side.

15.2 Joints must be clean and free from debris, eg dirt, mortar residue, likely to obstruct adhesion. The inner surfaces of the joints to be filled should be as smooth as possible. To achieve a perfect seal in masonry the changes in level at mortar joints must be as small as possible.

15.3 The length of the joint to be sealed must be measured and an overlap of 10 mm per metre run allowed when the tape is cut to the required length. The silicone release paper must be removed and the tape positioned in the joint, starting at the end, aligned with a short straight edge set back from the front face of the joint.

15.4 The tape will start to re-expand as soon as it is unwound from the roll. The rate of expansion is temperature dependent, and at low ambient temperatures the rate can be increased by gentle application of heat (see Table 5).

Table 5 Approximate times to expand to fill a joint using 20/3–7 tape

Temperature (°C)	Re-expansion time[1]
5	24 hours
23	10–120 mins

(1) At temperatures below 0°C re-expansion will be slow.

15.5 Compriband TP600 must be fully re-expanded and have sealed the joint before the illbruck FM230 Window Seal Foam is applied.

16 Application of illbruck FM230 Window Seal Foam

16.1 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.

16.2 The application gun is screwed onto the canister in accordance with the separate gun instructions, before directing the gun into a suitable waste container (eg carton or plastic bag) and pulling the trigger to charge the gun and dispense the foam.

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

16.4 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, moisten between cured layers.

16.5 Once the illbruck FM230 Window Seal Foam 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.

16.6 Uncured foam can be removed from the gun using the dual-purpose solvent spray cleaner sprayed onto a cloth.

16.7 Empty canisters are replaced by holding them upright and unscrewing.

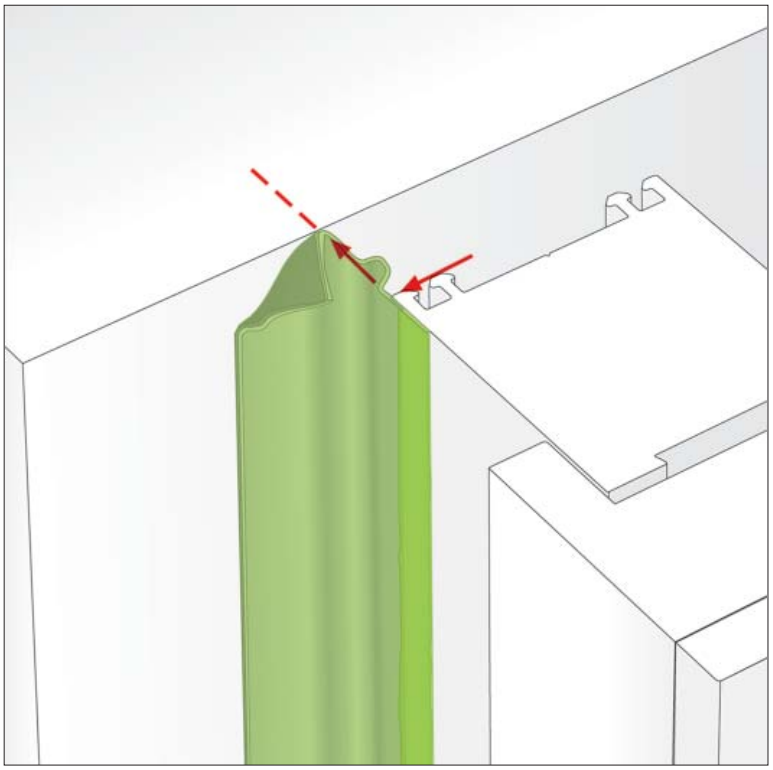
16.8 Uncured foam is removed from the threaded collar using the solvent cleaner. The inside of the gun can also be cleaned at this stage by screwing the gun to the dual solvent cleaner canister and following the instructions printed on it. A new foam canister should be fitted immediately and the gun charged as described in section 16.2.

16.9 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.

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

17.1 The illbruck ME500 Duo 'E' Flexible Window Membrane is bonded with the acrylic self-adhesive strip to the installed frame's internal face with a minimum 10–15 mm contact area. It must be ensured that it will be subsequently covered by finishes, for example dry lining, plaster, render, etc (see Figure 2).

Figure 2 illbruck ME500 Duo 'E' Flexible Window Membrane Attachment



17.2 The membrane is continued around corners and carefully folded to ensure continuity, ensuring that no radii are present at the corner interface with the internal blockwork or other construction material.

17.3 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.

17.4 For 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 where the butyl strip is to be located to the substrate of the reveal or blockwork.

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

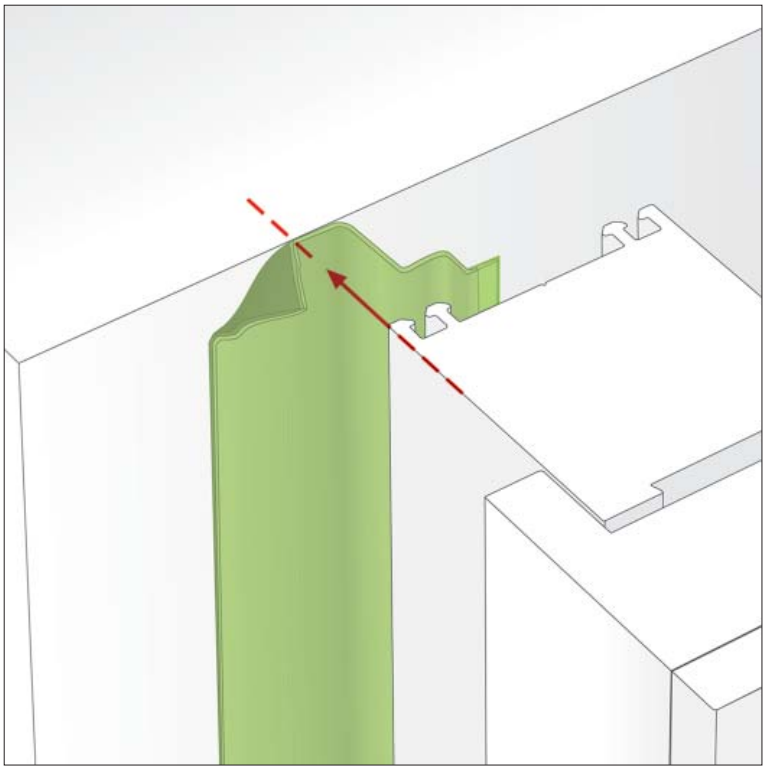
17.6 All lap joints and areas of potential water ingress or air leakage (corners, around fixing brackets, etc) must be sealed with Tremco SP525.

17.7 If a wet render system is to be applied then the illbruck ME500 Duo Flexible Window Membrane with plaster mesh must be used, further details are available from the Certificate holder.

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

18.1 The illbruck ME500 Duo 'W' Flexible Window Membrane is installed before fitting the frame into the reveal. The membrane is bonded with the acrylic self-adhesive strip to the inner edge of the window frame 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 illbruck ME500 Duo 'W' Flexible Window Membrane Attachment



18.2 At each corner, the membrane is bent and folded to ensure the acrylic self-adhesive strip is back-to-back, leaving an extra 20 mm length (40 mm of membrane) at all corners.

18.3 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 before attaching the fixing brackets to the edge of the frame over the membrane.

18.4 The frame is then fitted into the reveal with the membrane protruding across the internal reveal.

18.5 The correct size of Compriband TP600 is then installed as described in the *Installation* part and section 14 before application of the illbruck FM230 Window Seal Foam as described in the *Installation* part and section 15.

18.6 On damp, dusty or undulating surfaces, or if the ambient temperature is below 5°C, illbruck ME901 or illbruck ME902 Butyl and Bitumen Primer is applied where the butyl strip is to be located to the substrate of the reveal or blockwork.

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

18.8 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.

19 Tests

19.1 Tests were conducted on Compriband TP600 for water leakage on the tape and compression deflection of the foam and the results assessed.

19.2 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.

19.3 Tests were conducted on illbruck FM230 Window Seal Foam and the results assessed to determine:

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

20 Investigations

20.1 An evaluation was made of independent test data to determine:

- density of foam with impregnate
- density of foam
- percentage impregnated material
- tensile strength
- elongation at break
- compatibility with building materials (concrete, wood, aluminium and structural steel)
- resistance to driving rain(1)
- cold bend
- resistance to root penetration
- resistance to oil- and water-based wood preservatives
- resistance to fungal attack
- resistance to alkali
- resistance to heat ageing
- resistance to artificial weathering
- resistance to freeze/thaw cycling
- resistance to fatigue cycling.

(1) Test carried out with spray rate of 2 $l \cdot min^{-1} \cdot m^{-2}$ up to a pressure of 600 Pa.

20.2 Reports from BAM in Germany investigating the performance in use of the Compriband TP600, were assessed in terms of UK practice.

20.3 Reports from The German Institute for Windows Technology (Institut für Fenstertecknik) were evaluated relating to a number of installations where Compriband TP600 had been used.

20.4 An evaluation was made of independent test data carried out on the i3 System (Compriband TP600 — External Weather Seal, illbruck FM230 Window Seal Foam — Middle Insulation Seal, illbruck ME500 Duo Flexible Window Membrane — Internal airtight seal) relating to:

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

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

- adhesive tensile strength
- resistance to fire.

20.6 An evaluation was made of independent test data carried out on the illbruck FM230 Window Seal Foam relating to:

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

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

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

20.9 The manufacturing process was assessed, including the method adopted for quality control, and details were obtained of the quality and composition of the materials used.

Bibliography

EN 1026 : 2000 *Windows and doors — Air permeability — Test method*

EN 12207 : 1999 *Windows and doors — Air permeability — Classification*

Conditions of Certification

21 Conditions

21.1 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.

21.2 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.

21.3 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.

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

21.5 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
- individual 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.

21.6 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.

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