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Agrément Certificate  
**12/4891**  
Product Sheet 3

## TREMCO ILLBRUCK WINDOW AND DOOR PRODUCTS

### ILLBRUCK FM230 PRO FOAM WINDOW

This Agrément Certificate Product Sheet<sup>(1)</sup> relates to illbruck FM230 Pro Foam Window, a polyurethane foam for use around windows and doors to provide thermal and acoustic insulation.

(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 product will resist the passage of wind-driven rain, snow, run-off water and dust into the interior of the building (see section 7).

**Acoustic performance** — the installed product may reduce the transmission of airborne sound (see section 8).

**Thermal performance** — the product can improve the thermal performance of the building (see section 9).

**Risk of condensation** — the product 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 10).

**Durability** — the product will have a service life for the lifetime of the construction in which it has been installed (see section 12).

The BBA has awarded this Certificate to the company named above for the product described herein. This product 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](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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# Regulations

In the opinion of the BBA, illbruck FM230 Pro Foam Window, 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)

<b>Requirement:</b> C2(b)	<b>Resistance to moisture</b>
Comment:	The product will contribute to an installation meeting this Requirement. See section 7 of this Certificate.
<b>Requirement:</b> C2(c)	<b>Resistance to moisture</b>
Comment:	The product will contribute to an installation meeting this Requirement with respect to interstitial condensation. See section 10 of this Certificate.
<b>Requirement:</b> L1(a)(i)	<b>Conservation of fuel and power</b>
Comment:	The product can contribute to minimising heat loss at lintels, jambs and cills. See section 9 of this Certificate.
<b>Regulation:</b> 7	<b>Materials and workmanship</b>
Comment:	The product is acceptable. See section 12 and the <i>Installation</i> part of this Certificate.
<b>Regulation:</b> 26	<b>CO2 emission rates for new buildings</b>
Comment:	The product can contribute to minimising heat loss at jambs and cills. See section 9 of this Certificate.
<b>Regulation:</b> 26A	<b>Fabric energy efficiency rates for new dwellings (applicable to England only)</b>
Comment:	The product can contribute to meeting these Regulations. See section 9 of this Certificate.



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

<b>Regulation:</b> 8(1)	<b>Durability, workmanship and fitness of materials</b>
Comment:	The use of the product satisfies the requirements of this Regulation. See section 12 and the <i>Installation</i> part of this Certificate.
<b>Regulation:</b> 9	<b>Building standards applicable to construction</b>
Standard: 3.10	Precipitation
Comment:	The product 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 <sup>(1)(2)</sup> . See section 7 of this Certificate.
Standard: 3.15	Condensation
Comment:	The product can contribute to minimising the risk of interstitial and surface 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 section 10 of this Certificate.
Standard: 6.1b	Carbon dioxide emissions
Standard: 6.2	Building insulation envelope
Comment:	The product can contribute to minimising heat loss at lintels, jambs and cills. See sections 9 and 10 of this Certificate.
Standard: 7.1(a)	Statement of sustainability
Comment:	The product 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.
<b>Regulation:</b> 12	<b>Building standards applicable to conversions</b>
	Comments made in relation to this under Regulation 9, Standards 1 to 6 also apply to this Regulation, with reference to clause 0.12.1 <sup>(1)(2)</sup> and Schedule 6 <sup>(1)(2)</sup> .
	(1) Technical Handbook (Domestic).
	(2) Technical Handbook (Non-Domestic).



## The Building Regulations (Northern Ireland) 2012

<b>Regulation:</b> 23(a)(i)(iii)(b)	<b>Fitness of materials and workmanship</b>
Comment:	The product is acceptable. See section 12 and the <i>Installation</i> part of this Certificate.
<b>Regulation:</b> 28	<b>Resistance to moisture and weather</b>
Comment:	The product has adequate resistance to the ingress of rain and wind driven spray and so can contribute towards the wall satisfying this Regulation. See section 7 of this Certificate.
<b>Regulation:</b> 29	<b>Condensation</b>
Comment:	The product will contribute to minimising the risk of interstitial and surface condensation. See section 10 of this Certificate.
<b>Regulation:</b> 39(a)(i)	<b>Conservation measures</b>
<b>Regulation:</b> 40(2)	<b>Target carbon dioxide emission rate</b>
Comment:	The product can contribute to minimising heat loss at lintels, jambs and cills. See sections 9 and 10 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 illbruck FM230 Pro Foam Window, 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 illbruck FM230 Pro Foam Window is 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.

1.2 The foam is supplied in 750 ml canisters. An approximate guide to the number of linear meters each canister should yield is given in Table 1.

Table 1 Approximate yield<sup>(1)</sup> (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 <sup>(2)</sup>	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.

1.3 Ancillary items for use with the product 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 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 should not be exposed to temperatures in excess of 50°C, direct sunlight or the danger of impact.

3.2 illbruck FM230 Pro Foam Window has a flashpoint of  $<0^{\circ}\text{C}$  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.

## Assessment and Technical Investigations

The following is a summary of the assessment and technical investigations carried out on illbruck FM230 Pro Foam Window.

### Design Considerations

#### 4 Use

- 4.1 illbruck FM230 Pro Foam Window is satisfactory for use to fill small gaps and apertures and to provide 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 The foam will form a strong bond to most building materials, such as timber, brick, wood, stone, cement, plaster, metal and plastics. The product will not adhere to surfaces coated with Teflon, polythene or silicone.
- 4.3 The foam can be cut and trimmed about 60 minutes after application. Full cure is between one and four hours, depending on temperature and humidity at the time of application.
- 4.4 Once fully cured the foam can be further trimmed, using a sharp knife, or sanded down.
- 4.5 The cured foam is not resistant to UV light and must be protected.
- 4.6 When used and installed in accordance with this Certificate and the Certificate holder's instructions, the product can contribute towards an exterior building envelope meeting a minimum air leakage of less than  $1 \text{ m}^3 \cdot \text{hr}^{-1} \cdot \text{m}^{-2} @ 50 \text{ Pa}$ .

#### 5 Practicability of installation

illbruck FM230 Pro Foam Window is designed to be installed by a competent general builder or contractor.

#### 6 Adhesion

If the product is to be used with treated or coated substrates, for example timber preservatives or anodised or powder coated aluminium, or if the quality of a bond with a surface is in doubt, advice should be sought from the Certificate holder.

#### 7 Weathertightness



The cured foam is a closed cell structure and will resist the passage of moisture into the interior of the building.

#### 8 Acoustic performance

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

#### 9 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 product 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).

#### 10 Risk of condensation



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

#### 11 Maintenance

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

## 12 Durability



When properly specified and installed the product will remain effective for the service life of the installed window or door frame.

## Installation

### 13 General

Installation must be carried out in accordance with the Certificate holder's instructions.

### 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 3.2), and care must therefore 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 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 FM230 Pro Foam Window

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

15.2 The application gun is screwed onto 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.

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

15.4 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.

15.5 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.

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

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

15.8 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 15.2.

15.9 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.

## Technical Investigations

### 16 Tests

Tests were carried out on samples of the product supplied by the manufacturer, and the results assessed to determine:

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

## 17 Investigations

17.1 An examination was made of independent test data carried out on illbruck FM230 Pro Foam Window which covered:

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

17.2 An examination was made of independent test data carried out on the illbruck i3 System (the subject of Product Sheets 1 and 2) which covered:

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

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

17.4 An assessment of practicability of installation was made from a site installation visit.

17.5 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 ISO 9001 : 2008 *Quality management systems — Requirements*

## 18 Conditions

18.1 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.

18.2 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.

18.3 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.

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

18.5 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.

18.6 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.