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Agrément Certificate

14/5154

Product Sheet 4

EUROCELL PVC-U WINDOW SYSTEMS

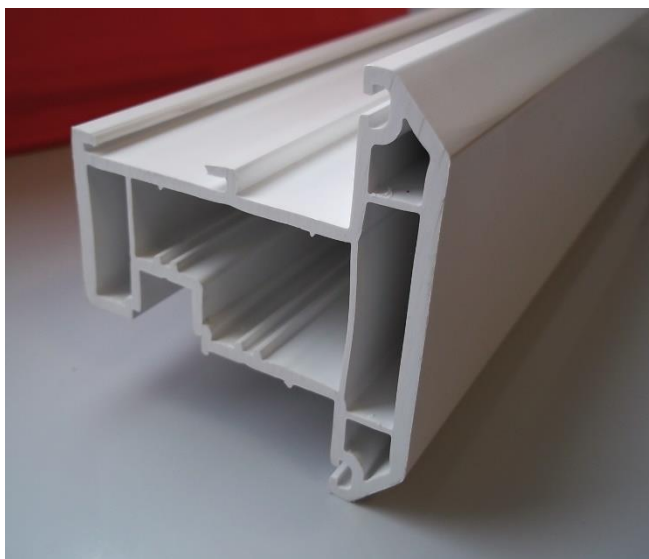
EUROCELL 70 MM OUTWARD OPENING SYSTEM

This Agrément Certificate Product Sheet⁽¹⁾ relates to the Eurocell 70 mm Outward Opening System in a white finish, for use in new and existing dwellings, light commercial premises and similar applications.

(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

Thermal properties — the thermal transmittance values (U value) of windows from within the range were calculated as between 1.3 and 1.6 W·m⁻²·K⁻¹ depending on the glazing unit (see section 6).

Weathertightness — the system can be used in the exposure situations described in this Certificate (see section 7).

Ventilation — opening lights can provide rapid ventilation (see section 8).

Unauthorised access — windows from within the range can contribute to preventing unauthorised access to dwellings and similar habitable applications (see section 9).

Durability — the PVC-U extruded windows will continue to function satisfactorily for a period in excess of 35 years, subject to the necessary maintenance being performed (see sections 15 and 16).



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

Claire Curtis-Thomas

Date of Second issue: 28 August 2019

John Albon
Chief Scientific Officer

Claire Curtis-Thomas
Chief Executive

Originally certificated on 13 October 2014

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.
Any photographs are for illustrative purposes only, do not constitute advice and should not be relied upon.*

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Regulations

In the opinion of the BBA, Eurocell 70 mm Outward Opening System, 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: B1	Means of warning and escape
Comment:	Windows of an appropriate size can be used as an escape route from floors not more than 4.5 m above ground level. See section 11 of this Certificate.
Requirement: C2(b)	Resistance to moisture
Comment:	The system has adequate resistance to the ingress of rain and wind-driven spray and so can contribute towards the wall satisfying this Requirement. See section 7.2 of this Certificate.
Requirement: F1(1)	Means of ventilation
Comment:	In assessing the contribution of the system to natural purge ventilation, the area of opening should be calculated in accordance with section 8.1 of this Certificate and related to floor area as set out in Approved Document F.
Requirement: K5.3	Safe opening and closing of windows etc (applicable to England only)
Comment:	Windows which can be opened by people in or about the building should be constructed or equipped so that they can be opened, closed or adjusted safely. See sections 13.3 and 13.4 of this Certificate.
Requirement: K5.4	Safe access for cleaning windows etc (applicable to England only)
Comment:	This Requirement can be satisfied when opening lights can be safely cleaned from inside the building. See section 13.1 of this Certificate.
Requirement: L1(a)(i)	Conservation of fuel and power
Comment:	The system can contribute to satisfying this Requirement. See sections 6.1 and 6.2 of this Certificate.
Requirement: N3	Safe opening and closing of windows, etc (applicable to Wales only)
Comment:	Opening lights that can be opened by people in or about the building should be constructed or equipped so that they can be opened, closed or adjusted safely. See sections 13.3 and 13.4 of this Certificate.
Requirement: N4	Safe access for cleaning windows etc (applicable to Wales only)
Comment:	This Requirement can be satisfied when opening lights can be safely cleaned from inside the building. See section 13.1 of this Certificate.
Regulation: 7	Materials and workmanship (applicable to Wales only)
Regulation: 7(1)	Materials and workmanship (applicable to England only)
Comment:	The system is acceptable. See sections 16.1 and 16.2 and the <i>Installation</i> part of this Certificate.
Regulation: 26	CO₂ emission rates for new buildings
Regulation: 26A	Fabric energy efficiency rates for new dwellings (applicable to England only)
Regulation: 26A	Primary energy consumption rates for new buildings (applicable to Wales only)
Regulation: 26B	Fabric performance values for new dwellings (applicable to Wales only)
Comment:	The system can contribute to satisfying these Regulations. See sections 6.1 and 6.2 of this Certificate.



The Building (Scotland) Regulations 2004 (as amended)

Regulation:	8(1)(2)	Durability, workmanship and fitness of materials
Comment:		The system satisfies this Regulation. See sections 15.1 to 15.4, 16.1 and 16.2 and the <i>Installation</i> part of this Certificate.
Regulation:	9	Building standards applicable to construction
Standard:	2.9	Escape
Comment:		Windows of an appropriate size can be used as an escape route from an apartment on an upper storey at a height of not more than 4.5 m above ground level. See section 11 of this Certificate.
Standard:	3.10	Precipitation
Comment:		The system has adequate resistance to the ingress of rain and wind-driven spray and so can contribute towards the wall satisfying this Standard, with reference to clause 3.10.1 ⁽¹⁾⁽²⁾ . See section 7.2 of this Certificate.
Standard:	3.14	Ventilation
Comment:		In calculating the contribution of the system to natural ventilation with reference to clauses 3.14.2 ⁽¹⁾⁽²⁾ and 3.14.3 ⁽¹⁾ of this Standard, the area of opening can be calculated in accordance with section 8.1 of this Certificate.
Standard:	3.15	Condensation
Comment:		The system will not constitute a significant condensation risk and so can contribute towards the wall satisfying this Standard, with reference to clauses 3.15.1 ⁽¹⁾ , 3.15.4 ⁽¹⁾ and 3.15.5 ⁽¹⁾ . See section 12.1 of this Certificate.
Standard:	3.16	Natural lighting
Comment:		In calculating the contribution of the system to natural lighting, with reference to clauses 3.16.1 ⁽¹⁾ and 3.16.3 ⁽¹⁾ of this Standard, the area of glazing can be calculated in accordance with section 10 of this Certificate.
Standard:	4.8(c)	Danger from accidents
Comment:		Opening lights that can be safely cleaned from inside the building can satisfy this Standard, with reference to clause 4.8.3 ⁽¹⁾⁽²⁾ . See section 13.1 of this Certificate.
Standard:	4.8(e)	Danger from accidents
Comment:		Opening lights that can be opened, closed and adjusted safely can satisfy this Standard, with reference to clause 4.8.5 ⁽¹⁾⁽²⁾ . See section 13.3 of this Certificate.
Standard:	6.1(b)	Carbon dioxide emissions
Standard:	6.2	Building insulation envelope
Comment:		The system can contribute to satisfying these Standards, with reference to clauses 6.1.1 ⁽¹⁾ , 6.1.2 ⁽¹⁾ , 6.1.4 ⁽²⁾ , 6.1.6 ⁽¹⁾ , 6.1.7 ⁽¹⁾ , 6.2.1 ⁽¹⁾⁽²⁾ , 6.2.4 ⁽²⁾ , 6.2.6 ⁽¹⁾ , 6.2.7 ⁽¹⁾ , 6.2.8 ⁽²⁾ , 6.2.9 ⁽¹⁾⁽²⁾ , 6.2.11 ⁽¹⁾⁽²⁾ and 6.2.13 ⁽¹⁾⁽²⁾ . See sections 6.1 and 6.2 of this Certificate.
Standard:	7.1(a)(b)	Statement of sustainability
Comment:		The system can contribute to satisfying 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. In addition, the system can contribute to a construction meeting a higher level of sustainability as defined in this Standard, with reference to clauses 7.1.4 ⁽¹⁾⁽²⁾ [Aspects 1 ⁽¹⁾⁽²⁾ and 2 ⁽¹⁾], 7.1.6 ⁽¹⁾⁽²⁾ [Aspects 1 ⁽¹⁾⁽²⁾ and 2 ⁽¹⁾] and 7.1.7 ⁽¹⁾⁽²⁾ [Aspect 1 ⁽¹⁾⁽²⁾]. See sections 6.1 and 6.2 of this Certificate.

Regulation:	12	Building standards applicable to conversions
Comment:	All comments given for 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 (as amended)

Regulation:	23	Fitness of materials and workmanship
Comment:	The system is acceptable. See sections 16.1 and 16.2 and the <i>Installation</i> part of this Certificate.	
Regulation:	28(b)	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 7.2 of this Certificate.	
Regulation:	33(c)	Means of escape
Comment:	Windows of an appropriate size can be used as an escape route in dwellings. See section 11 of this Certificate.	
Regulation:	39(a)(i)	Conservation measures
Regulation:	40(2)	Target carbon dioxide emission rate
Comment:	The system can contribute to satisfying these Regulations. See sections 6.1 and 6.2 of this Certificate.	
Regulation:	65(1)	Means of ventilation
Comment:	When calculating the area of window openings for ventilation purposes, see section 8.1 of this Certificate.	
Regulation:	98	Safe opening and closing of windows, skylights and ventilators
Comment:	The requirements of this Regulation are considered to be satisfied if the window complies with Technical Booklet V, Section 4. See sections 13.3 and 13.4 of this Certificate.	
Regulation:	99	Safe means of access for cleaning glazing
Comment:	Opening lights that can be safely cleaned from inside the building can satisfy this Regulation. See section 13.1 of this Certificate.	

Construction (Design and Management) Regulations 2015

Construction (Design and Management) Regulations (Northern Ireland) 2016

Information in this Certificate may assist the client, designer (including Principal Designer) and contractor (including Principal Contractor) to address their obligations under these Regulations.

See sections: 3 *Delivery and site handling* (3.3) and 13 *Safety* (13.8) of this Certificate.

Additional Information

NHBC Standards 2019

In the opinion of the BBA the use of Eurocell 70 mm Outward Opening System, if installed, used and maintained in accordance with this Certificate, can satisfy or contribute to satisfying the relevant requirements in relation to *NHBC Standards*, Chapter 6.7 *Doors, windows and glazing*.

General

The Certificate holder is a system supplier, supplying bar length of window profile. The window system detailed within this Certificate is manufactured by BBA-approved window fabricators. Details of currently approved window fabricators can be found on the BBA website.

Technical Specification

1 Description

1.1 The Eurocell 70 mm Outward Opening System comprises single top-hung, single side-hung and multilight windows, including opening lights and fixed lights, all framed in white finish unplasticised polyvinyl chloride (PVC-U) complying with BS EN 12608-1 : 2016 and glazed internally or externally with sealed double-glazed units⁽¹⁾.

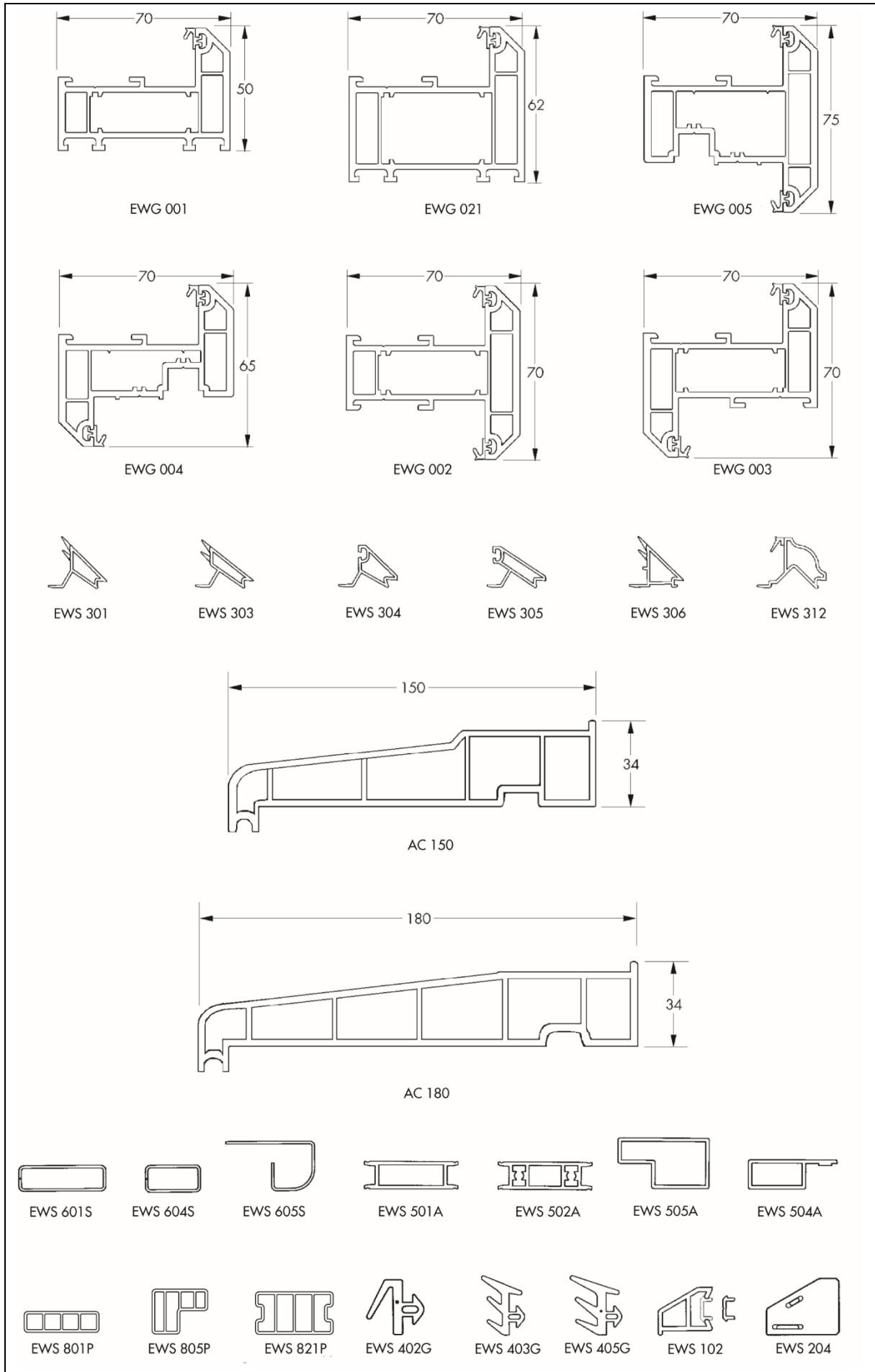
(1) Outside the scope of this Certificate.

1.2 The profiles covered by this Certificate (listed in Table 1 and shown in Figure 1) are supplied with integral gaskets made from black plasticised PVC-U material, thus eliminating the need for separate weatherseals and glazing gaskets.

Table 1 Profiles

Manufacturer's designation	Profile type	Application
EWG 001	L-section	outer frame
EWG 021	L-section	intermediate frame
EWG 005	T-section	opening light frame
EWG 004	Z-section	opening light frame
EWG 002	T-section	mullion/transom
EWG 003	Z-section	mullion/transom
EWS 301	—	co-extruded glazing bead (28 mm)
EWS 303	—	conventional glazing bead (24 mm)
EWS 304	—	conventional glazing bead (24/28 mm)
EWS 305	—	conventional glazing bead (16/20 mm)
EWS 306	—	co-extruded glazing bead (28 mm)
EWS 312	—	Post-calibrated co-extruded glazing bead (28 mm)
AC 150	—	sill (150 mm)
AC 180	—	sill (180 mm)
EWS 601S	—	galvanized steel reinforcement (EWG 001, EWG 002 and EWG 003)
EWS 604S	—	galvanized steel reinforcement (EWG 004)
EWS 605S	—	galvanized steel reinforcement (EWG 005)
EWS 501A	—	aluminium reinforcement (EWG 001, EWG 002 and EWG 003)
EWS 502A	—	aluminium reinforcement (EWG 001, EWG 002) mechanical joints
EWS 505A	—	aluminium reinforcement (EWG 005)
EWS 504A	—	aluminium reinforcement (EWG 004)
EWS 801P	—	PVC-U reinforcement (EWG 003)
EWS 805P	—	PVC-U reinforcement (EWG 005)
EWS 821P	—	PVC-U thermal insert reinforcement (EWG 021)
EWS 402G	—	weatherseal
EWS 403G	—	3 mm compression gasket
EWS 405G	—	5 mm compression gasket
EWS 102	—	drip bar
EWS 204	—	drip bar end cap
—	—	double-sided tape

Figure 1 Profiles (all dimensions in mm)



1.3 The Certificate holder must adhere to the methods of selection, machining and assembly of frame components as detailed in the fabrication instructions and this Certificate.

1.4 Multilight windows incorporate mullions and transoms connected to the outer frame and, where relevant, to each other by means of welded or mechanical joints.

1.5 Where mullions and transoms are mechanically jointed, the outer frame is screwed through to ported aluminium inserted in the mullion or transom in accordance with the fabrication instructions and this Certificate.

1.6 Drainage is provided by a series of slots (5 by 30 mm) and holes, positioned in accordance with the fabrication instructions. In general, on multilight units, each element is treated as a separate window and drainage slots cut accordingly, to retain symmetry where possible.

Reinforcement

1.7 Where their length exceeds 1500 mm, outer frame members are reinforced with galvanized steel, aluminium or PVC-U in accordance with the fabrication instructions.

1.8 Where their length exceeds 700 mm, opening light frame members are reinforced with galvanized steel, aluminium or PVC-U in accordance with the fabrication instructions.

1.9 Where their length exceeds 900 mm, welded mullions and transoms are reinforced with galvanized steel, aluminium or PVC-U in accordance with the fabrication instructions. Mechanically jointed mullions and transoms are always reinforced with aluminium.

1.10 Galvanized steel is roll-formed from material with a Z275N coating complying with BS EN 10346 : 2015. Aluminium is extruded from alloy type 6063-T6 to BS EN 755-2 : 2016.

1.11 PVC-U is extruded from ERM_a or RM_a material as defined in BS EN 12608-1 : 2016.

Size range

1.12 This Certificate covers Eurocell 70 mm outward opening top-hung, side-hung and fixed-light windows and combinations of these within the limitations shown in Table 2.

Table 2 Size restrictions

	Dimension (mm)
Outward opening windows	
Maximum overall width of any outer frame	2400
Maximum overall height of any outer frame	1600
Maximum perimeter	8000
Maximum length of mullions or transoms	
reinforced with metal	1600
unreinforced	1600
<i>Top-hung opening lights</i>	
Maximum size of top-hung opening light ⁽¹⁾ (separately or in a multilight)	
part reinforced	700 wide x 800 high
fully reinforced	1250 wide x 1350 high
<i>Side-hung opening lights</i>	
Maximum size of side-hung opening light ⁽¹⁾ (separately or in a multilight)	750 wide x 1350 high

(1) Opening light sizes refer to outer frame to outer frame, or outer frame to mullion/transom centre line dimension, and must not exceed limitations on weight or size imposed by the friction hinge manufacturer.

Fittings

1.13 BBA-approved hardware must be used with this system.

1.14 Outward opening top-hung and side-hung windows covered by this Certificate are fitted with friction hinges constructed from stainless steel type 1.4016 to BS EN 10088-2 : 2014. The hinges incorporate a plastic slider which can be adjusted by means of a brass screw or a die-cast, slot-headed cam to provide the necessary braking action. The hinges are fixed to the frames with screws. Opening windows are fastened by means of a concealed espagnolette and/or shootbolt locking system constructed from materials assessed and approved by the BBA.

1.15 Espagnolette/shootbolt and tilt and turn handles are available with a key locking facility as an option. The espagnolette, shootbolt, keeps and tilt and turn mechanism are fixed by means of self-tapping screws which penetrate a thickened area of the profile wall or the reinforcement. The espagnolette/shootbolt and tilt and turn handles (with various finishes) are formed from materials assessed and approved by the BBA.

1.16 Additional components are available from the range of fittings to restrict the opening of the window to a maximum distance of 100 mm.

Glazing

1.17 Windows are supplied factory glazed or ready for glazing using double-glazed units⁽¹⁾ with glass thicknesses in accordance with BS 6262-1 : 2017. All glass is positioned by plastic setting blocks and packing pieces.

(1) Outside the scope of this Certificate.

1.18 The glazing units must satisfy the requirements of BS EN 1279-2 : 2018 and (if relevant) BS EN 1279-3 : 2018.

1.19 NHBC require⁽¹⁾ that compliance with the standards referred to in sections 1.17 and 1.18 is confirmed by an appropriate independent technical approvals authority.

(1) *NHBC Standards 2019, Chapter 6.7.7 Glazing, Insulating Glass Units.*

Weatherstripping and gaskets

1.20 The integral black gaskets and weatherstripping are incorporated onto the profiles by post-calibration co-extrusion (PCE) (see Figure 1). The double-glazed unit is secured by PCE bead.

2 Manufacture

2.1 The system is fabricated using conventional production processes for PVC-U windows. The windows are fabricated from white finish PVC-U profiles, produced by conventional extrusion techniques from material complying with BS EN 12608-1 : 2016. See also sections 1.3 to 1.20 of this Certificate.

2.2 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.

2.3 The management system of Eurocell Profiles Ltd has been assessed and registered as meeting the requirements of BS EN ISO 9001 : 2015 by BSI (Certificate FM 45551).

3 Delivery and site handling

3.1 The windows are delivered to site glazed or ready for glazing. For transportation, they are suitably protected to avoid damage.

3.2 The windows should be stored under cover in a clean area, on edge and suitably supported to avoid distortion or damage.

3.3 The weight of the unglazed frame and of the glazing (which can be obtained from the Certificate holder) and their ease of handling, particularly by one person, must be taken into account when planning site operations.

Assessment and Technical Investigations

The following is a summary of the assessment and technical investigations carried out on the Eurocell 70 mm Outward Opening System.

Design Considerations

4 Use

The Eurocell 70 mm Outward Opening System is satisfactory for use in non-loadbearing applications where windows are installed vertically into the external walls of new and existing dwellings, light commercial premises and similar applications.

5 Practicability of installation

The system is designed to be installed by a competent general builder, or a contractor, experienced with this type of system.

6 Thermal properties



6.1 The following Eurocell 70 mm outward opening PVC-U window, 1230 mm wide by 1480 mm high, achieved a U value (U_w) of $1.3 \text{ W}\cdot\text{m}^{-2}\cdot\text{K}^{-1}$ when calculated in accordance with BS EN ISO 10077-1 : 2017 and BS EN ISO 10077-2 : 2017

- a side-hung opening light and a fixed-light
 - EWG 001 outer frame (unreinforced)
 - EWG 005 sash (reinforced with EWS 805P)
 - EWG 003 mullion (reinforced with EWS 801P)
 - EWS 301 glazing bead
- 4/20/4 mm sealed double-glazed unit
 - 20 mm argon-filled cavity (90%)
 - external pane: 4 mm Diamant (Saint Gobain)
 - internal pane: 4 mm Planitherm Total+ (Saint Gobain), (ϵ) = 0.05
 - spacer: Swisspacer V.

6.2 The following Eurocell 70 mm outward opening PVC-U window, 1230 mm wide by 1480 mm high, achieved a U value (U_w) of $1.6 \text{ W}\cdot\text{m}^{-2}\cdot\text{K}^{-1}$ when calculated in accordance with BS EN ISO 10077-1 : 2017 and BS EN ISO 10077-2 : 2017

- a side-hung opening light and a fixed-light
 - EWG 021 outer frame (reinforced with EWS 821P)
 - EWG 005 sash (reinforced with EWS 805P)
 - EWG 003 mullion (reinforced with EWS 801P)
 - EWG 312 glazing bead
- 4/20/4 mm sealed double-glazed unit
 - 20 mm air-filled cavity
 - external pane: 4 mm Planilux (Saint Gobain)
 - internal pane: 4 mm Planitherm Total+ (Saint Gobain), (ϵ) = 0.05
 - spacer: aluminium.

6.3 The overall thermal insulation of the window will be dependent on the performance of the double-glazed units. For units other than those described above, the indicative U values shown in Table 6e of SAP 2012 *The Government's Standard Assessment Procedure for Energy Rating of Dwellings* can be used. When available, a certified U value by measurement to BS EN ISO 12567-1 : 2010, or calculation to BS EN ISO 10077-1 : 2017 and BS EN ISO 10077-2 : 2017,

should be used in preference. Alternatively, Window Energy Ratings may be available for specific frame and glazing combinations on the BFRC website (www.bfrc.org).

6.4 Design U values are detailed in the documents supporting the national Building Regulations.

7 Weathertightness

7.1 Selected samples from the system were tested, generally in accordance with BS EN 14351-1 : 2006, BS EN 1026 : 2016, BS EN 1027 : 2016 and BS EN 12211 : 2016, and are suitable for use as indicated in Table 3. The classifications are based on the assumption that the outer frame is supported on all four sides in accordance with the Certificate holder’s instructions. These test results are indicative and only valid for the windows tested. If classification for a particular window is required, and is not covered within Table 3, the window should be tested in accordance with BS EN 14351-1 : 2006.



7.2 The classifications in Table 3 can be used to determine suitability when selecting exposure category, in conjunction with Annex A of BS 6375-1 : 2015.

7.3 For unusual building layouts, building shapes or ground topography, the designer will need to give particular consideration to the prevailing exposure conditions.

Table 3 Indicative weathertightness classifications

Window style	Resistance to wind according to BS EN 12210 : 2016	Watertightness according to BS EN 12208 : 2000	Air permeability according to BS EN 12207 : 2016	UK exposure category (BS 6375-1 : 2015)
<i>Outward opening</i>				
<i>Multilight units</i>				
width up to a maximum of 2400 mm, height up to a maximum of 1600 mm, perimeter up to a maximum 8000 mm with mullion or transom lengths not exceeding 1600 mm (reinforced with EWS 601S)	Class A2 800 Pa	Class 6A	Class 4	800
width up to a maximum of 2400 mm, height up to a maximum of 1600 mm, perimeter up to a maximum 8000 mm with mullion or transom lengths not exceeding 1600 mm (unreinforced)	Class A2 800 Pa	Class 7A	Class 3	800
<i>Individual opening lights</i>				
top hung — part reinforced	Class AE2400 2400 Pa	Class 8A	Class 3	2000+
top hung — fully reinforced	Class AE2400 2400 Pa	Class 7A	Class 2	2000+
side hung — fully reinforced	Class A4 1600 Pa	Class 8A	Class 4	1600
<i>Fixed lights</i>	Class A4 1600 Pa	Class 7A	Class 4	1600

8 Ventilation



8.1 The opening area for natural ventilation may be calculated by multiplying together the overall width and height dimensions of the frame containing the opening lights reduced by the relevant profile dimensions. For opening lights abutting a mullion or transom, the overall width or height of that element will be given as the dimension from the edge of the outer frame to the centre line of the mullion or transom or, where relevant, between centres of the mullion or transom.

8.2 The background ventilation requirements of the various national Building Regulations can be satisfied by the incorporation in the window of a suitably sized trickle ventilator⁽¹⁾.

(1) Outside the scope of this Certificate.

9 Unauthorised access

9.1 Opening lights (fitted with lock mechanisms as described in sections 1.14 and 1.15 of this Certificate) when fastened in the closed position, cannot be opened by manipulation from the outside (for example, by the insertion of a thin blade) and can contribute to offering security against intrusion.

9.2 Key-operated handles are required for certain windows to meet the security requirements of *NHBC Standards 2019 Chapter 6.7 Doors, windows and glazing*.

9.3 Glass packing must be carried out to the Certificate holder's recommendations to prevent forced entry by the flexing of frame members allowing disengagement of the lock mechanism.

9.4 Externally fitted glazing beads can be removed but subsequent removal of the glass without breakage and noise is extremely difficult due to the glazing being additionally secured by glazing clips or security glazing tape. Removal of internally fitted glazing beads from the outside is extremely difficult.

10 Glass area



The approximate unobstructed glass area of the windows is determined by deducting from the overall width and height, the appropriate profile dimensions. For example, a fixed light requires twice the outer frame dimension to be deducted from the overall width and height.

11 Unobstructed opening area



11.1 A window can provide an adequate means of escape from a dwelling when it incorporates an opening light that:

- is in a room with a floor not more than 4.5 m above ground level
- is positioned so that the bottom of the opening is no more than 1.1 m above the floor
- provides a clear opening area of at least 0.33 m² and is not less than 450 mm high by 450 mm wide, which may be at an angle or straight through. The obstruction caused by opening lights hung on projecting friction stays must be taken into account when the clear opening is determined.

11.2 In addition:

England and Wales — windows must remain open without needing to be held

Scotland — locks may be used but must not cause a permanent obstruction to satisfy clause 2.9.4⁽¹⁾ as escape windows

(1) Technical Booklet (Domestic).

Northern Ireland — the window must be positioned at least 800 mm above the floor.

12 Condensation risk



12.1 In normal domestic or similar applications, PVC-U windows will not constitute a significant condensation risk when correctly installed.

12.2 Guidance on satisfactory design details is given in *Limiting thermal bridging and air leakage : Robust construction details for dwellings and similar building*, TSO 2002, and the *Accredited Construction Details*. Further information is contained in BRE Report BR 262 : 2002.

13 Safety



13.1 For opening lights fitted with suitable hinges, the external face of the window can be cleaned from inside the building.

13.2 For windows not covered by section 13.1, reasonable provision must be made for safe means of access to clean both faces of the window. For ways of complying with the requirements of the national Building Regulations, see:

England — Approved Document K5.4 (for buildings other than dwellings)

Wales — Approved Document N4 (for buildings other than dwellings)

Scotland — Standard 4.8(c), clauses 4.8.3⁽¹⁾⁽²⁾ and 4.8.4⁽¹⁾⁽²⁾

(1) Technical Handbook (Domestic).

(2) Technical Handbook (Non-Domestic).

Northern Ireland — Technical Booklet V, Section 5.



13.3 The windows can comply with the recommendations of BS 8213-1 : 2004 with regard to the positioning of hand-operated controls.



13.4 When fitted with a restrictor, movement of the opening light can be effectively limited to give an opening of not more than 100 mm, as recommended for child safety in BS 8213-1 : 2004.

13.5 Reasonable provision must be made to minimise the risk of people colliding with an open window when moving in or about a building. For ways of complying with the requirements of the national Building Regulations, see:

England — Approved Document K5.1 (for buildings other than dwellings)

Wales — Approved Document N1 (for buildings other than dwellings)

Scotland — Standard 4.8(a), clause 4.8.1⁽¹⁾⁽²⁾

(1) Technical Handbook (Domestic).

(2) Technical Handbook (Non-Domestic).

Northern Ireland — Technical Booklet H, Section 8. The requirements of Regulation 60 only apply to a window installed in a dwelling which opens over a public route of travel.

13.6 Transparent glazing, of which people may be unaware and with which they are likely to collide, must incorporate features which make it apparent. For ways of complying with the requirements of the national Building Regulations, see:

England — Approved Document K5.2 (for buildings other than dwellings)

Wales — Approved Document N2 (for buildings other than dwellings)

Scotland — Standard 4.8(b), clause 4.8.2⁽¹⁾⁽²⁾

(1) Technical Handbook (Domestic).

(2) Technical Handbook (Non-Domestic).

Northern Ireland — Technical Booklet V, Section 3.

13.7 Approved Document K4 to the Building Regulations (England), Approved Document N1 to the Building Regulations (Wales), *NHBC Standards 2019*, Chapter 6.7.7, and BS 6262-4 : 2018⁽¹⁾ make recommendations to ensure the safe performance of glazing. These include the use of safety glass complying with BS EN 12600 : 2002 in locations where accidental collision is likely. The windows can be supplied with toughened or laminated glazing units, but the performance of the glazing units is outside the scope of this Certificate.

(1) Dealing with the safety of people upon impact with glazing.

13.8 When selecting means of access during the period of installation (for example, use of scaffolding), the safety of the operatives, occupants and passers-by should be considered.

14 Ease of operation

The windows can be operated without difficulty when correctly installed.

15 Maintenance



15.1 The windows can be re-glazed but if the integral gasket is damaged it must be replaced by conventional gaskets and weatherstripping. The use of conventional gaskets and weatherstripping with this system is possible, but specific details are outside the scope of this Certificate.

15.2 If a co-extruded glazing bead is fitted and the gasket is damaged (for example, during re-glazing), it may be necessary to replace the complete bead. These operations should be carried out by specialist operatives using materials recommended by the Certificate holder and approved by the BBA.

15.3 If damage occurs, the furniture and fittings can be replaced.

15.4 The friction hinges and locking mechanism should be cleaned and lubricated periodically to minimise wear and to ensure smooth operation. Care should be taken to avoid applying lubricant to the sliders as this will impair their braking action. If necessary, the resistance of the sliders can be adjusted using the brass screw or die-cast, slot-headed cam provided in each slider.

15.5 The seal to the building structure will need to be replaced within the life of the window.

15.6 The PVC-U frame members can be cleaned using a soft sponge and soapy water. Solvent-based, corrosive or abrasive cleaners must not be used. If dirt is allowed to build up on the members over long periods, it may become more difficult to restore the surface appearance.

15.7 Care should be taken when using proprietary materials for cleaning the glass, to ensure that deposits are not allowed to remain on the PVC-U where they may cause discoloration and damage to the surface. In addition, care must be taken to avoid damage to, or discoloration of, the members when stripping paint from adjacent timber (for example, by means of a blowlamp or paint stripper).

16 Durability



16.1 The PVC-U windows will continue to function satisfactorily for a period in excess of 35 years subject to the necessary maintenance being performed as described in section 15 of this Certificate.

16.2 The co-extruded glazing beads, gaskets and fittings, including the hinges, locking mechanism and operating handles, as described in this Certificate, may need to be replaced within the life of the window, particularly when exposed to aggressive environments, such as coastal or industrial locations.

16.3 Any slight colour change or surface dulling that might occur will be uniform over the visible surfaces of the windows.

16.4 Paint can adversely affect the impact strength of the PVC-U frame members and the application of dark colours to white profiles could lead to a risk of thermal distortion. Therefore, the windows should not be overcoated.

17 Reuse and recyclability

The PVC-U profiles can be recycled.

18 General

18.1 The window must be fixed into the opening in accordance with BS 8213-4 : 2016, using proprietary expanding anchors through the frame, or galvanized steel fixing lugs.

18.2 Openings in new walls should be formed using a suitable template, 10 mm wider and higher than the window to be installed. The window should not be built-in at the construction stage.

18.3 In common with other types of window fitted to prepared openings, the system must be correctly positioned in relation to damp-proof courses to prevent water penetration to the internal reveal.

18.4 The provision of a cavity closer and/or cavity barrier around the window opening, prior to the installation, may be required. Details of products covered by an Agrément Certificate can be found on the BBA website (www.bbacerts.co.uk).

Technical Investigations

19 Tests

19.1 Tests were carried out and the results assessed to determine:

- air permeability
- watertightness
- effect of wind loads
- efficiency of window fittings
- resistance to mechanical loading
- ease of operation.

19.2 Tests were carried out, generally in accordance with BS 7412 : 2007 on windows and BS EN 12608-1 : 2016 on the PVC-U extrusions.

19.3 BBA-approved hardware has been tested to BS EN 1670 : 2007 for resistance to salt-spray corrosion.

20 Investigations

20.1 The thermal transmittance values of outward opening windows were calculated in accordance with BS EN ISO 10077-1 : 2017 and BS EN ISO 10077-2 : 2017.

20.2 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

- BRE Report BR 262 : 2002 *Thermal insulation : avoiding risks*
- BS 6262-1 : 2015 *Glazing for buildings — General methodology for the selection of glazing*
BS 6262-4 : 2018 *Glazing for buildings — Code of practice for safety related to human impact*
- BS 6375-1 : 2015 + A1 : 2016 *Performance of windows and doors — Classification for weathertightness and guidance on selection and specification*
- BS 7412 : 2007 *Specification for windows and doorsets made from unplasticized polyvinyl chloride (PVC-U) extruded hollow profiles*
- BS 8213-1 : 2004 *Windows, doors and rooflights — Design for safety in use and during cleaning of windows, including door-height windows and roof windows — Code of practice*
BS 8213-4 : 2016 *Windows and doors — Code of practice for the survey and installation of windows and external doorsets*
- BS EN 755-2 : 2016 *Aluminium and aluminium alloys — Extruded rod/bar, tube and profiles — Mechanical properties*
- BS EN 1026 : 2016 *Windows and doors — Air permeability — Test method*
- BS EN 1027 : 2016 *Windows and doors — Watertightness — Test method*
- BS EN 1279-2 : 2018 *Glass in building — Insulating glass units — Long term test method and requirements for moisture penetration*
BS EN 1279-3 : 2018 *Glass in building — Insulating glass units — Long term test method and requirements for gas leakage rate and for gas concentration tolerances*
- BS EN 1670 : 2007 *Building hardware — Corrosion resistance — Requirements and test methods*
- BS EN 10088-2 : 2014 *Stainless steels — Technical delivery conditions for sheet/plate and strip of corrosion resisting steels for general purposes*
- BS EN 10346 : 2015 *Continuously hot-dip coated steel flat products — Technical delivery conditions*
- BS EN 12207 : 2016 *Windows and doors — Air permeability — Classification*
- BS EN 12208 : 2000 *Windows and doors — Watertightness — Classification*
- BS EN 12210 : 2016 *Windows and doors — Resistance to wind load — Classification*
- BS EN 12211 : 2016 *Windows and doors — Resistance to wind load — Test method*
- BS EN 12600 : 2002 *Glass in building — Pendulum test — Impact test method and classification for flat glass*
- BS EN 12608-1 : 2016 *Unplasticized polyvinylchloride (PVC-U) profiles for the fabrication of windows and doors — Classification, requirements and test methods*
- BS EN 14351-1 : 2006 + A2 : 2016 *Windows and doors — Product standard, performance characteristics — Windows and external pedestrian doorsets*
- BS EN ISO 9001 : 2015 *Quality management systems — Requirements*
- BS EN ISO 10077-1 : 2017 *Thermal performance of windows, doors and shutters — Calculation of thermal transmittance — General*
BS EN ISO 10077-2 : 2017 *Thermal performance of windows, doors and shutters — Calculation of thermal transmittance — Numerical method for frames*
- BS EN ISO 12567-1 : 2010 *Thermal performance of windows and doors — Determination of thermal transmittance by the hot box method — Complete windows and doors*

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
- 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.

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