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Agrément Certificate
05/4286
Product Sheet 1

EUROCELL PVC-U WINDOW SYSTEMS

EUROLOGIK 70 OUTWARD OPENING AND TILT AND TURN SYSTEMS

This Agrément Certificate Product Sheet(1) relates to Eurologik 70 Outward Opening and Tilt and Turn Systems, chamfered and ovolo, in white, cream and woodgrain finish, for use in new and existing dwellings, light commercial premises and similar habitable 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 — windows from within the range have a thermal transmittance value (U value) of 1.4 $W \cdot m^{-2} \cdot K^{-1}$ (see section 6).

Weathertightness — the systems 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, light commercial premises and similar habitable applications (see section 9).

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

The BBA has awarded this Certificate to the company named above for the systems described herein. These systems been assessed by the BBA as being fit for their intended use provided they are installed, used and maintained as set out in this Certificate.

On behalf of the British Board of Agrément

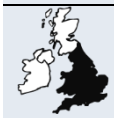
Date of Fourth issue: 25 January 2019

Originally certificated on 20 May 2005

John Albon – Head of Approvals Construction Products

Claire Curtis-Thomas
Chief Executive

In the opinion of the BBA, the Eurologik 70 Outward Opening and Tilt and Turn Systems, 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 systems have 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: **C2(c)** **Resistance to moisture**
Comment: The systems will not constitute a significant condensation risk and so can contribute towards the wall satisfying this Requirement. See section 12.1 of this Certificate.

Requirement: **F1(1)** **Means of ventilation**
Comment: In assessing the contribution of the systems 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: The systems can satisfy this Requirement 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 systems 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.

Requirement: **Q1** **Unauthorised access (applicable to England only)**
Comment: The outward opening windows as described in Enhanced Security Sheet ES1 can satisfy this Requirement for new dwellings (see section 9.3 of this Certificate).

Regulation: **7** **Materials and workmanship (applicable to Wales only)**
Regulation: **7(1)** **Materials and workmanship (applicable to England only)**
Comment: The systems are acceptable. See sections 16.1 and 16.2 and the *Installation* part of this Certificate.

Regulation:	**26**	**CO_2 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 systems 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 systems satisfy this Regulation. See sections 15.1 to 15.4 and 16.1 to 16.2 and the *Installation* 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 systems have 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 systems 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 systems 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 systems 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:	4.13	Security
Comment:		The outward opening windows as described in Enhanced Security Sheet ES1 can satisfy this Standard with reference to clause 4.13.1(c)[(1)]. See section 9.3 of this Certificate.
Standard:	6.1(b)	Carbon dioxide emissions
Standard:	6.2	Building insulation envelope
Comment:		The systems 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 systems 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 systems 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 these systems 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 systems are acceptable. See sections 16.1 and 16.2 and the *Installation* part of this Certificate.
Regulation:	**28(b)**	**Resistance to moisture and weather**
Comment:		The systems have 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 systems 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 *Safety* (13.8) of this Certificate.

Additional Information

NHBC Standards 2019

In the opinion of the BBA, Eurologik 70 Outward Opening and Tilt and Turn Systems, 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*.

CE marking

The Certificate holder has taken the responsibility of CE marking the Eurologik 70 Outward Opening and Tilt and Turn Systems in accordance with harmonised European Standard BS EN 14351-1 : 2006.

Technical Specification

1 Description

1.1 Eurologik 70 Outward Opening and Tilt and Turn Systems, available in chamfered and ovolo styles, comprise single top-hung, side-hung and tilt and turn windows and multilight windows, including opening lights and fixed lights, all framed in white, cream or woodgrain finish unplasticised polyvinyl chloride (PVC-U) profiles complying with BS EN 12608-1 : 2016 and glazed internally or externally with sealed double-glazed units(1).

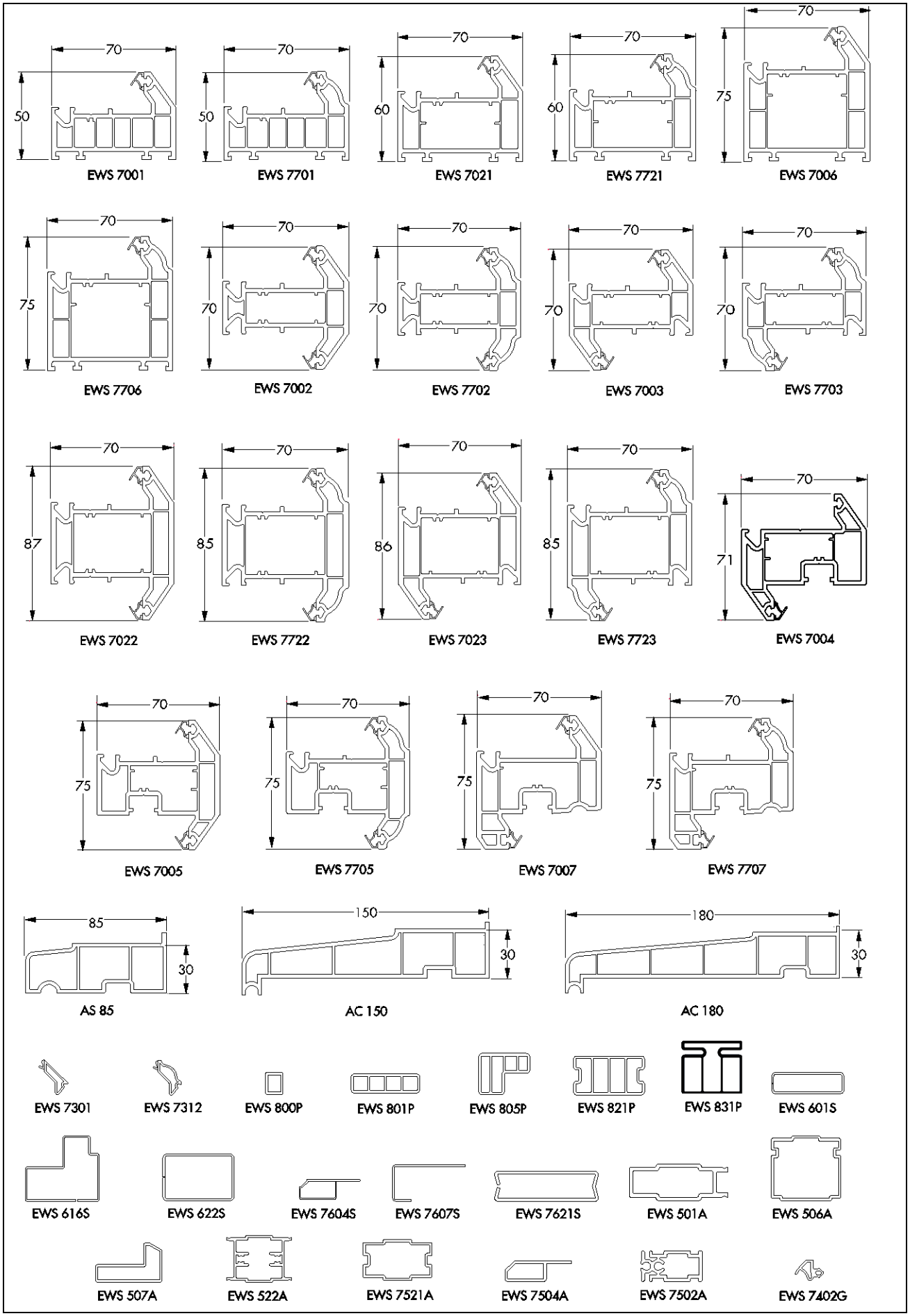
(1) Outside the scope of this Certificate.

1.2 Woodgrain profiles are surface covered with PVC which incorporates a clear protective lacquer. Profiles are available with the foil applied to both visible faces of a brown or tan PVC-U substrate or to the exterior face only of a white or cream PVC-U substrate. 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	Outward Opening	Tilt and Turn
EWS 7001	L-section	outer frame	✓	—
EWS 7701	L-section	outer frame	✓	—
EWS 7021	L-section	outer frame	✓	✓
EWS 7721	L-section	outer frame	✓	✓
EWS 7006	L-section	outer frame	✓	✓
EWS 7706	L-section	outer frame	✓	✓
EWS 7002	T-section	transom/mullion	✓	—
EWS 7702	T-section	transom/mullion	✓	—
EWS 7003	Z-section	transom/mullion	✓	—
EWS 7703	Z-section	transom/mullion	✓	—
EWS 7022	T-section	transom/mullion	✓	✓
EWS 7722	T-section	transom/mullion	✓	✓
EWS 7023	Z-section	transom/mullion	✓	✓
EWS 7723	Z-section	transom/mullion	✓	✓
EWS 7004	Z-section	sash	✓	—
EWS 7005	T-section	sash	✓	—
EWS 7705	T-section	sash	✓	—
EWS 7007	Z-section	sash	—	✓
EWS 7707	Z-section	sash	—	✓
AS 85	—	sill (85 mm)	✓	✓
AC 150	—	sill (150 mm)	✓	✓
AC 180	—	sill (180 mm)	✓	✓
EWS 7301	—	co-extruded glazing bead (28 mm)	✓	✓
EWS 7312	—	co-extruded glazing bead (28 mm)	✓	✓
EWS 800P	—	PVC-U thermal insert reinforcement (EWS 7001, EWS 7701)	✓	—
EWS 801P	—	PVC-U thermal insert reinforcement (EWS 7702, EWS 7002, EWS 7003, EWS 7703)	✓	✓
EWS 805P	—	PVC-U thermal insert reinforcement (EWS 7005, EWS 7705)	✓	—
EWS 821P	—	PVC-U thermal insert reinforcement (EWS 7021, EWS 7721, EWS 7022, EWS 7722, EWS 7023, EWS 7723)	✓	✓
EWS 831P	—	PVC-U thermal insert reinforcement (EWS 7006)	✓	✓
EWS 601S	—	galvanized steel reinforcement (EWS 7021, EWS 7721, EWS 7002, EWS 7702, EWS 7003, EWS 7703)	✓	✓
EWS 616S	—	galvanized steel reinforcement (EWS 7006)	—	✓
EWS 622S	—	galvanized steel reinforcement (EWS 7022, EWS 7722, EWS 7023, EWS 7723)	✓	✓
EWS 7604S	—	galvanized steel reinforcement (EWS 7005, EWS 7705, EWS 7004)	✓	—
EWS 7607S	—	galvanized steel reinforcement (EWS 7007, EWS 7707)	—	✓
EWS 7621S	—	galvanized steel reinforcement (EWS 7002, EWS 7702, EWS 7003, EWS 7703)	✓	✓
EWS 501A	—	aluminium reinforcement (EWS 7002, EWS 7702)	✓	✓
EWS 506A	—	aluminium reinforcement (EWS 7006)	—	✓
EWS 507A	—	aluminium reinforcement (EWS 7007)	—	✓
EWS 522A	—	aluminium reinforcement (EWS 7022, EWS 7722, EWS 7023, EWS 7723)	✓	✓
EWS 7521A	—	aluminium reinforcement (EWS 7021, EWS 7721)	✓	—
EWS 7504A	—	aluminium reinforcement (EWS 7004, EWS 7005, EWS 7705)	✓	—
EWS 7502A	—	aluminium reinforcement (EWS 7002, EWS 7702, EWS 7003, EWS 7703)	✓	✓
EWS 7402G	—	replacement glazing gasket	✓	—

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 steel or aluminium reinforcement 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. Woodgrain finished sills are vented, as described in the fabrication instructions, to prevent pressure changes causing distortion.

Reinforcement

1.7 Outer frame members of white or cream windows are not normally reinforced unless specified. Windows with a woodgrain finish have a fully reinforced outer frame and sill.

1.8 Where their length exceeds 1000 mm, side-hung and top-hung opening light frame members of white and cream windows are reinforced with galvanized mild steel, aluminium or PVC-U thermal inserts in accordance with the fabrication instructions. Tilt and turn opening light frame members of white and cream windows are reinforced with galvanized mild steel or aluminium in accordance with the fabrication instructions. Woodgrain finish opening light members are always fully reinforced.

1.9 Where their length exceeds 1000 mm, welded mullions and transoms of white and cream windows are reinforced with galvanized mild steel or PVC-U thermal inserts. Mechanically jointed mullions and transoms are always reinforced with aluminium in accordance with the fabrication instructions and this Certificate. Windows with a woodgrain finish have fully reinforced mullions and transoms.

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

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

Size range

1.12 This Certificate covers Eurologik 70 Outward Opening top- and side-hung windows, Tilt and Turn windows 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 or height of any outer frame	2400
Maximum perimeter	8000
Maximum length of mullions or transoms	
reinforced with metal reinforcement	1600
reinforced with PVC-U thermal insert	1500
Top-hung opening lights	
Maximum size of top-hung opening light(1) (separately or in a multilight)	
unreinforced	1000 wide x 1000 high
fully reinforced	1200 wide x 1350 high
thermal enhancer	1220 wide x 1354 high
Side-hung opening lights	
Maximum size of side-hung opening light(1) (separately or in a multilight)	
unreinforced	750 wide x 1000 high
reinforced	750 wide x 1500 high
thermal enhancer	750 wide x 1350 high
Tilt and turn windows	
Maximum overall width or height of any outer frame	1800
Maximum length of mullions or transoms	1500
Maximum perimeter	6600
Tilt and turn opening lights	
Maximum size of a single tilt and turn opening light	1500 wide x 1500 high
Fixed lights	
reinforced	2000 wide x 1500 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 or the tilt and turn hinge manufacturer.

Fittings

1.13 BBA-approved hardware must be used with these systems.

1.14 Outward opening top- 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 concealed espagnolette and/or shootbolt locking systems constructed from materials assessed and approved by the BBA.

1.15 Tilt and turn windows are fitted with a specific type of tilt and turn mechanism comprising an espagnolette-type locking system, hinges and a tilt stay, all formed from materials assessed and approved by the BBA. The mechanism incorporates locking rollers and, as an option, shootbolt locks which engage with keeps fixed to the outer frame, and is operated by a handle. The tilt and turn mechanism locates in a purpose-made groove in the opening light profile.

1.16 Espagnolette 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.

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

Glazing

1.18 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.

1.19 The glazing units must satisfy the requirements of BS EN 1279-2 : 2002 and (if relevant) BS EN 1279-3 : 2002.

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

(1) *NHBC Standards* 2018, Chapter 6.7.7 *Glazing, Insulating Glass Units*.

Weatherstripping and gaskets

1.21 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 post-calibration co-extruded bead.

2 Manufacture

2.1 The systems are fabricated using conventional production processes for PVC-U windows.

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 Unique Window Systems Ltd has been assessed and registered as meeting the requirements of BS EN ISO 9001 : 2008 by the BBA (Certificate 06/Q010).

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. Particular care is needed to avoid damaging woodgrain finishes, as it may be impossible to restore the appearance.

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 Eurologik 70 Outward Opening and Tilt and Turn Systems.

Design Considerations

4 Use

Eurologik 70 Outward Opening and Tilt and Turn Systems are 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 habitable applications.

5 Practicability of installation

The systems are designed to be installed by a competent general builder, or a contractor, experienced with these types of systems.

6 Thermal properties

6.1 The following Eurologik 70 Outward Opening PVC-U window, 1230 mm wide by 1480 mm high, achieved a U value (U_w) of 1.4 $W \cdot m^{-2} \cdot K^{-1}$ when calculated to BS EN ISO 10077-1 : 2017 and BS EN ISO 10077-2 : 2017:

- a side-hung opening light and a fixed-light
- EWS 7721 outer frame (unreinforced)
- EWS 7005 sash (reinforced with EWS 805P)
- EWS 7703 mullion (reinforced with EWS 801P)
- EWS 7312 glazing bead
- 4/20/4 mm sealed double-glazed unit
  — 20 mm argon-filled cavity (90%)
  — external pane: 4 mm Planilux (Saint Gobain)
  — internal pane: 4 mm Planitherm Total+ (Saint Gobain) (ε_n = 0.05)
  — spacer: Swisspacer V.

6.2 The following Eurologik 70 Tilt and Turn PVC-U window, 1230 mm wide by 1480 mm high, achieved a U value (U_w) of 1.4 $W \cdot m^{-2} \cdot K^{-1}$ when calculated in accordance with BS EN ISO 10077-1 : 2017 and BS EN ISO 10077-2 : 2017:

- a tilt and turn opening light and a fixed-light
- EWS 7006 outer frame (reinforced with EWS 831P)
- EWS 7007 sash (reinforced with EWS 7607S)
- EWS 7002 mullion (reinforced with EWS 801P)
- EWS 7301 glazing bead
- 4/20/4 mm sealed double-glazed unit
  — 20 mm argon-filled cavity (90%)
  — external pane: 4 mm Optiwhite, Pilkington
  — internal pane: 4 mm KS Pilkington (ε_n = 0.05)
  — spacer: Edgetech Super Spacer.

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 systems were tested for weathertightness, 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 of this Certificate. 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 it 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 Weathertightness classifications

Window style	Air permeability according to BS EN 12207 : 2016	Watertightness according to BS EN 12208 : 2000	Resistance to wind according to BS EN 12210 : 2016	UK exposure category BS 6375-1 : 2015
Outward opening				
Multilight units				
width up to a maximum of 2400 mm, height up to a maximum of 1000 mm, perimeter up to a maximum 6800 mm with mullion or transom lengths not exceeding 1000 mm (reinforced with EWS 7621S)	Class 4	Class E1050	Class AE2400 (2400 Pa)	2000+
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 7621S)	Class 4	Class 8A	Class A2 (800 Pa)	800
width up to a maximum of 2400 mm, height up to a maximum of 1200 mm, perimeter up to a maximum 6000 mm with mullion or transom lengths not exceeding 1200 mm (reinforced with EWS 501A)	Class 3	Class E1050	Class A5 (2000 Pa)	2000+
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 501A)	Class 4	Class 9A	Class A3 (1200 Pa)	1200
width up to a maximum of 1500 mm, height up to a maximum of 1500 mm, perimeter up to a maximum 6000 mm with mullion or transom lengths not exceeding 1350 mm (reinforced with EWS 800P)	Class 4	Class 9A	Class A3 (1200 Pa)	1200
Individual opening lights				
top hung — unreinforced	Class 4	Class 9A	Class A4 (1600 Pa)	1600
top hung — fully reinforced	Class 4	Class 9A	Class A4 (1600 Pa)	1600
top hung — thermal enhancer	Class 2	Class 9A	Class A4 (1600 Pa)	1600
side hung — unreinforced	Class 4	Class 9A	Class A4 (1600 Pa)	1600
side hung — fully reinforced	Class 4	Class 9A	Class A4 (1600 Pa)	1600
side hung — thermal enhancer	Class 4	Class 9A	Class A5 (2000Pa)	2000
Fixed lights	Class 4	Class E1050	Class A4 (1600 Pa)	1600
Tilt and turn				
Individual opening lights all windows	Class 3	Class 7A	Class A3 (1200 Pa)	1200

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 1.13 to 1.16 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 satisfy the security requirements of *NHBC Standards* 2018 Chapter 6.7 *Doors, windows and glazing*.

9.3 The Eurologik 70 Outward Opening Windows as described in Enhanced Security Sheet ES1 have been tested in accordance with PAS 24 : 2016, Annex C, and can contribute to satisfying the regulatory requirements for unauthorised access in new dwellings in England, and new and existing dwellings in Scotland.

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

9.5 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. 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 overall 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 m^2 and 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 not less than 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 buildings*, TSO 2002 and the *Accredited Construction Details*. Further information is contained in BRE Report BR 262 : 2002.

13 Safety

13.1 For tilt and turn opening lights, the external face of the window can be cleaned from inside the building as windows open in. Outward opening windows fitted with suitable hinges may be able to be cleaned safely.

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* 2018, Chapter 6.7.7, and BS 6262-4 : 2005(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 the 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 the Eurologik 70 systems 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, tilt and turn gear 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 (particularly on woodgrain finishes) as the loss of the acrylic lacquer will have a serious effect on durability. 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).

15.8 Repair of the woodgrain foil is outside the scope of this Certificate.

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 (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 for the white, cream and woodgrain finishes, assuming in the latter case that the acrylic lacquer is undamaged.

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, paint must not be applied.

17 Reuse and recyclability

The PVC-U profiles can be recycled.

Installation

18 General

18.1 The window must be fixed into the opening, in accordance with the recommendations in 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 systems 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 to determine:

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

19.2 Tests were carried out generally in accordance with BS 7412 : 2007 on windows, and BS EN 12608-1 : 2016 and BS 7722 : 2010 on the PVC-U extrusions and woodgrain finish profiles.

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 and tilt and turn 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 : 2017 *Glazing for buildings — General methodology for the selection of glazing*
BS 6262-4 : 2005 *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 7722 : 2010 *Surface covered PVC-U profiles for windows and doors — Specification*

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 : 2002 *Glass in building — Insulating glass units — Long term test method and requirements for moisture penetration*
BS EN 1279-3 : 2002 *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 poly(vinyl chloride) (PVC-U) profiles for the fabrication of windows and doors — Classification, requirements and test methods — Non-coated PVC-U profiles with light coloured surfaces*

BS EN 14351-1 : 2006 + A2 : 2016 *Windows and doors — Product standard, performance characteristics — Windows and external pedestrian doorsets*

BS EN ISO 9001 : 2008 *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*

PAS 24 : 2016 *Enhanced security performance requirements for doorsets and windows in the UK — Doorsets and windows intended to offer a level of security suitable for dwellings and other buildings exposed to comparable risk*

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.