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Agrément Certificate

08/4600

Product Sheet 2

## BEAUFORT ALUMINIUM WINDOW SYSTEMS

### BEAUFORT ADVANCED PLUS OUTWARD OPENING ALUMINIUM WINDOW SYSTEM

#### PRODUCT SCOPE AND SUMMARY OF CERTIFICATE

This Certificate relates to the Beaufort Advanced Plus Outward Opening Aluminium Window System, coated with polyester powder coating for use in replacement and new-build applications.

#### AGRÉMENT CERTIFICATION INCLUDES:

- factors relating to compliance with UK 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 insulation** — the thermal transmittance value (U value) of the outward opening windows was calculated by computer simulation according to BS EN ISO 10077-2 :2003 and can achieve estimated U values of between 1.9 and 1.6  $Wm^{-2}K^{-1}$  (see section 5).

**Weathertightness** — the system can be used in various exposure situations (see section 6).

**Ventilation** — opening lights can provide rapid ventilation, and background ventilation can be provided by the use of a suitably-sized trickle ventilator (see section 7).

**Basic security against intrusion** — windows meet the basic requirements of NHBC and Zurich (see section 8).

**Durability** — the aluminium frames will have a life of at least 40 years (see section 14).



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

On behalf of the British Board of Agrément

Chris Hunt  
Head of Approvals — Physics

Greg Cooper  
Chief Executive

Date of First issue: 26 March 2009

*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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In the opinion of the BBA, the Beaufort Advanced Plus Outward Opening Aluminium Window System, if used in accordance with the provisions of this Certificate, will meet or contribute to meeting the relevant requirements of the following Building Regulations:



### The Building Regulations 2000 (as amended) (England and Wales)

Requirement:	<b>B1</b>	Means of warning and escape
Comment:		Where a window is required, in a dwelling house, to provide a means of escape from an inner room or a loft space converted into a habitable room, the window can meet this Requirement when it incorporates an opening light providing a clear opening area of at least 0.33 m <sup>2</sup> and not less than 450 mm high by 450 mm wide and is positioned as set out in Approved Document B1. The obstruction caused by opening lights hung on projecting friction stays must be taken into account when the clear opening is determined. However, the route through the window can be at an angle rather than straight through.
Requirement:	<b>C2(c)</b>	Resistance to moisture
Comment:		The system can contribute to satisfying this Requirement. See section 10.1 of this Certificate.
Requirement:	<b>F1</b>	Means of ventilation
Comment:		In calculating the contribution of the product to natural purge ventilation, the area of opening should be calculated in accordance with section 7.1 of this Certificate and related to floor area as set out in Approved Document F1. Background ventilation can be provided by the methods described in section 7.2 of this Certificate.
Requirement:	<b>K4</b>	Protection from collision with open windows etc
Comment:		In buildings other than dwellings, this Requirement can be met by installing windows so that projecting parts are kept away from people moving in and around the building; or by installing features which guide people away from any open window. Approved Document K4 sets out some ways of complying with this Requirement.
Requirement:	<b>L1(a)(i)</b>	Conservation of fuel and power
Comment:		The system incorporating the appropriate specified glazing can contribute to meeting this Requirement in new buildings and can meet this Requirement in existing buildings and extensions to existing buildings. See section 5.1 of this Certificate.
Requirement:	<b>N1</b>	Protection against impact
Requirement:	<b>N2</b>	Manifestation of glazing
Comment:		Glazing less than 800 mm above floor or ground level should meet the requirements of N1. Except where windows incorporate only small panes, glass and plastics sheet materials which satisfy the test requirements of BS 6206 : 1981 should be used to meet the requirements of N1. See section 11.3 of this Certificate. To meet the requirements of N2, it may be necessary to incorporate features into glazing in non-domestic buildings to make its existence apparent to people using them.
Requirement:	<b>N3</b>	Safe opening and closing of windows etc
Comment:		In buildings other than dwellings, 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 11.1 and 11.2 of this Certificate.
Requirement:	<b>N4</b>	Safe access for cleaning windows etc
Comment:		In buildings other than dwellings, this Requirement can be met where provision is made for safe means of access for cleaning both sides of glazed surfaces where there is danger of falling more than two metres. Approved Document N4 sets out some ways of complying with this Requirement.
Requirement:	<b>Regulation 7</b>	Materials and workmanship
Comment:		The system is acceptable. See sections 14.1 to 14.4 and the <i>Installation</i> part of this Certificate.



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

Regulation:	<b>8(1)(2)</b>	<b>Fitness and durability of materials and workmanship</b>
Comment:		The system can satisfy this Regulation. See sections 13.1, 13.2, 14.1 to 14.4 and the <i>Installation</i> part of this Certificate.
Regulation:	<b>9</b>	<b>Building standards — construction</b>
Standard:	<b>2.9</b>	Escape
Comment:		Windows providing an unobstructed openable area of at least 0.33 m <sup>2</sup> and at least 450 mm high and 450 mm wide can satisfy this Standard, with reference to clause 2.9.4 <sup>(1)</sup> as escape windows, when suitably located. The obstruction caused by opening lights hung on projecting friction stays must be taken into account when the clear opening is determined. However, the route through the window may be at an angle rather than straight through.
Standard:	<b>3.10</b>	Precipitation
Comment:		Walls incorporating the system, installed and used in accordance with the provisions of this Certificate, can satisfy this Standard, with reference to clause 3.10.1 <sup>(1)(2)</sup> . See Table 3 of this Certificate.
Standard:	<b>3.14</b>	Ventilation
Comment:		In calculating the contribution of the system to natural ventilation, with reference to clauses 3.14.2 <sup>(1)(2)</sup> and 3.14.3 <sup>(1)</sup> to this Standard, the area of opening can be calculated in accordance with section 7.1 of this Certificate. Trickle ventilation, with reference to clauses 3.14.3 <sup>(2)</sup> and 3.14.5 <sup>(1)</sup> , can be provided as described in section 7.2 of this Certificate.

Standard:	3.15	Condensation
Comment:		The system can contribute to satisfying this Standard, with reference to clauses 3.15.1 <sup>(1)</sup> and 3.15.4 <sup>(1)</sup> . See section 10.1 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 <sup>(1)</sup> and 3.16.2 <sup>(1)</sup> to this Standard, the area of glazing can be calculated in accordance with section 9 of this Certificate.
Standard:	4.8(b)(c)	Danger from accidents
Comment:		Glazing must comply with BS 6262-4 : 2005 where accidental collision with it is likely, in order to satisfy this Standard, with reference to clause 4.8.2 <sup>(1)(2)</sup> . The provisions described in clauses 4.8.3 <sup>(1)(2)</sup> and 4.8.4 <sup>(1)(2)</sup> to this Standard, regarding the safe cleaning of windows, must also be taken into account. See sections 11.1 to 11.3.
Standard:	6.1(b)	Carbon dioxide emissions
Standard:	6.2	Building insulation envelope
Comment:		In satisfying these Standards, with reference to clauses 6.1.6 <sup>(1)</sup> , 6.2.1 <sup>(1)(2)</sup> , 6.2.3 <sup>(1)</sup> , 6.2.4 <sup>(1)(2)</sup> , 6.2.5 <sup>(1)</sup> , 6.2.7 <sup>(1)</sup> , 6.2.8 <sup>(2)</sup> , 6.2.9 <sup>(1)</sup> and 6.2.10 <sup>(2)</sup> , the U values given in section 5.1 of this Certificate should be used. For glazing other than that described in this Certificate indicative U values shown in Table 6e of SAP 2005 <i>The Government's Standard Assessment Procedure for Energy Rating of Dwellings</i> can be used. However, when available, a certified U value should be used in preference to the tabulated data.
Regulation:	12	<b>Building standards – conversions</b>
Comment:		All comments given for this product under Regulation 9, 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) 2000 (as amended)

Regulation:	B2	Fitness of materials and workmanship
Comment:		The system is acceptable. See sections 14.1 to 14.4 and the <i>Installation</i> part of this Certificate.
Regulation:	B3(2)	Suitability of certain materials
Comment:		The system is acceptable. See sections 13.1 and 13.2 of this Certificate.
Regulation:	C4(b)	Resistance to ground moisture and weather
Comment:		The windows are weathertight, see Table 3 in this Certificate and can thus contribute to the ability of the wall to meet this Regulation.
Regulation:	E2(c)	Means of escape
Comment:		Where a window is required, in a dwelling house, to provide a means of escape from an inner room or a loft space converted into a habitable room, the window can meet this Requirement when it incorporates an opening light providing a clear opening area of at least 0.33 m <sup>2</sup> and not less than 450 mm high by 450 mm wide and is positioned as set out in Technical Booklet E. The obstruction caused by opening lights hung on projecting friction stays must be taken into account when the clear opening is determined.
Regulation:	F2(a)(i)	Conservation measures
Regulation:	F3	Target carbon dioxide Emissions Rate
Comment:		The system incorporating the appropriate specified glazing can contribute to meeting this Regulation in new buildings and can meet this Regulation in existing buildings and extensions to existing buildings. See section 5.1 of this Certificate.
Regulation:	H7	Protection from collision with open windows, skylights or ventilators
Comment:		Reasonable provision shall be made to minimise the risk of people colliding with an open window when moving in or about a building. In so far as they relate to a dwelling, the requirements of H7 shall only apply to a window which opens over a public route of travel. The requirements of this Regulation shall be deemed to be satisfied if the window installation complies with Technical Booklet H, Section 7, December 2000.
Regulation:	K2	Means of ventilation
Comment:		When calculating the area of window openings for ventilation purposes, see section 7.1 of this Certificate. Trickle ventilation can be provided by the methods described in section 7.2 of this Certificate.
Regulation:	V2	Impact with glazing
Comment:		Where people are likely to come into contact with glazing in a building the requirements of this Regulation shall be deemed to be satisfied if the glazing complies with Technical Booklet V, Section 2, December 2000. See section 11.3 of this Certificate.
Regulation:	V3	Transparent glazing
Comment:		In a building, other than in a dwelling, transparent glazing, of which people may be unaware and with which they are likely to collide, shall incorporate features which make it apparent. The requirements of this Regulation shall be deemed to be satisfied if the glazing complies with Technical Booklet V, Section 3, December 2000.
Regulation:	V4	Safe opening and closing of windows, skylights and ventilators
Comment:		Any window which can be opened by a person shall be so constructed or equipped that it may be opened, closed and adjusted safely. The requirements of this Regulation shall be deemed to be satisfied if the window complies with Technical Booklet V, Section 4, December 2000. See sections 11.1 to 11.3 of this Certificate.

Regulation:	V5	Safe means of access for cleaning glazing
Comment:		Reasonable provision shall be made for safe means of access to clean glazing. The requirements of this Regulation shall be deemed to be satisfied if the means of access complies with Technical Booklet V, Section 5, December 2000.

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

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

See section: 2 *Delivery and site handling* (2.3 and 2.4).

## Non-regulatory Information

### NHBC Standards 2008

NHBC accepts the use of the Beaufort Advanced Plus Outward Opening Aluminium Window System, when installed and used in accordance with this Certificate, in relation to NHBC Standards, Chapter 6.7 *Doors, windows and glazing*.

### Zurich Building Guarantee Technical Manual 2007

In the opinion of the BBA, the Beaufort Advanced Plus Outward Opening Aluminium Window System, when installed and used in accordance with this Certificate, satisfies the requirements of the *Zurich Building Guarantee Technical Manual*, Section 4 *Superstructure*, Sub-section *External walls – doors, windows and roof lights* (page 172).

## General

This Certificate relates to the Beaufort Advanced Plus Outward Opening Aluminium Window System for use as replacement and new-build windows.

The windows are suitable for use in the exposure situations described in section 6.

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 Beaufort Advanced Plus Outward Opening Aluminium Window System comprises single top-hung windows, side-hung and multilight windows with opening lights and fixed lights, all framed in aluminium with a thermal break and glazed internally or externally with sealed double-glazed units<sup>(1)</sup>.

(1) Outside the scope of this Certificate.

1.2 The windows are fabricated from aluminium profiles produced by conventional extrusion techniques from designated treated alloy 6063 in temper T6, complying with BS EN 12020-1 : 2006, BS EN 12020-2 : 2006 and BS EN 755-9 : 2008. The profiles are anodized in accordance with BS 3987 : 1991 and coated with polyester powder paint complying with the requirements of BS EN 12206-1 : 2004 and/or BS 6496 : 1984 or BS EN 13438 : 2005. The profiles covered by this Certificate (shown in Figure 1 and listed in Table 1) are fitted with separate weatherseals and glazing gaskets using thermoplastic elastomer.

1.3 The aluminium profiles incorporate a polyamide strip PA66, 25% glass reinforced, which acts as a thermal break and eliminates cold bridging.

1.4 The methods of selection machining and assembly of the frame components are detailed in the *Beaufort Fabrication Manual*.

1.5 The aluminium extrusions are cut to length and all holes drilled. The mitred corners are mechanically crimped together and then sealed with sealant. Mullions and transoms are joined to the outer frame by screwing through into ports in the aluminium extrusions.

1.6 Drainage is provided by holes 25 mm long and a minimum width of 5 mm, positioned in accordance with the *Beaufort Fabrication Manual*.

#### Size range

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

Figure 1 Components

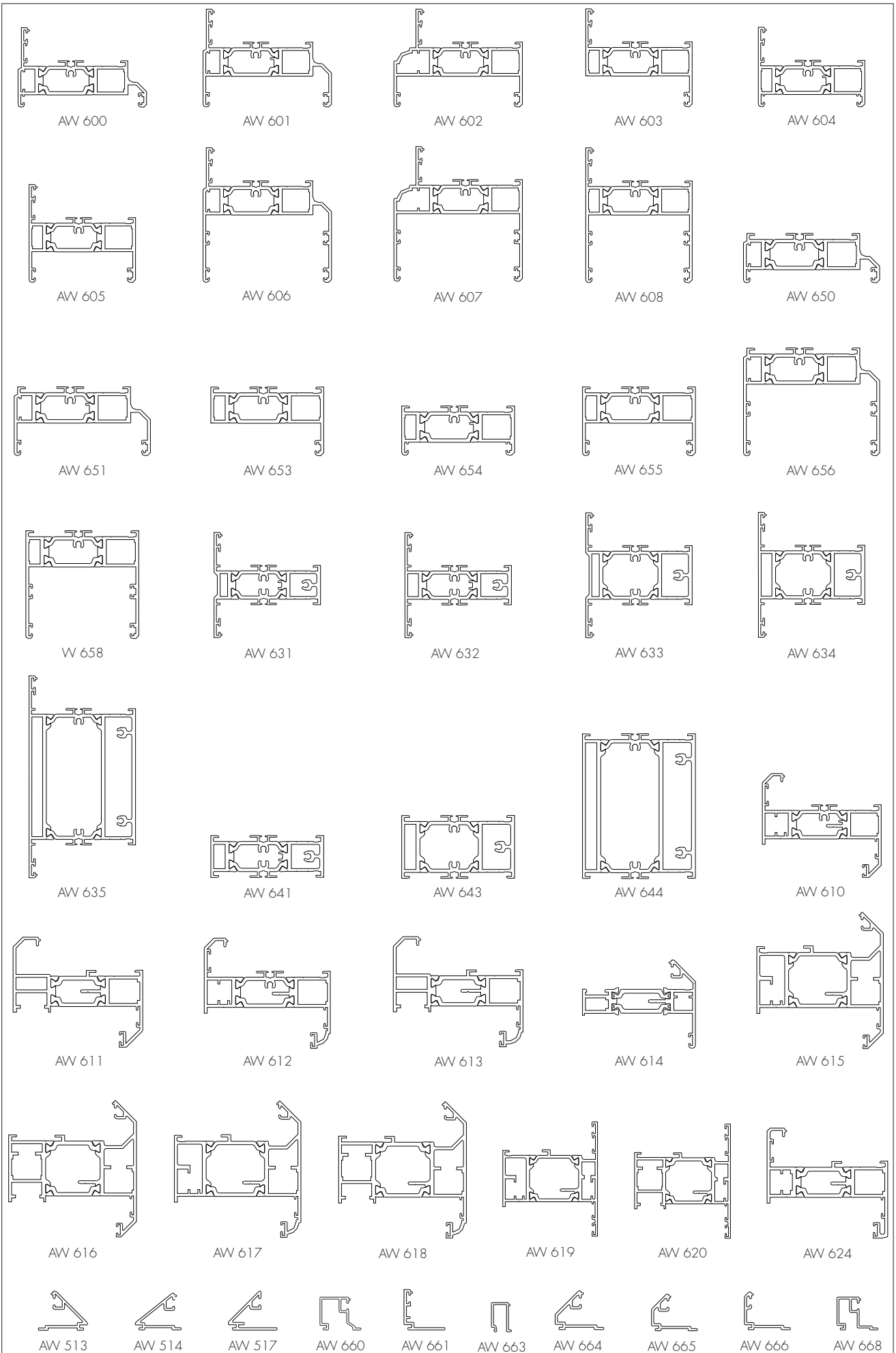


Figure 1 Components (continued)

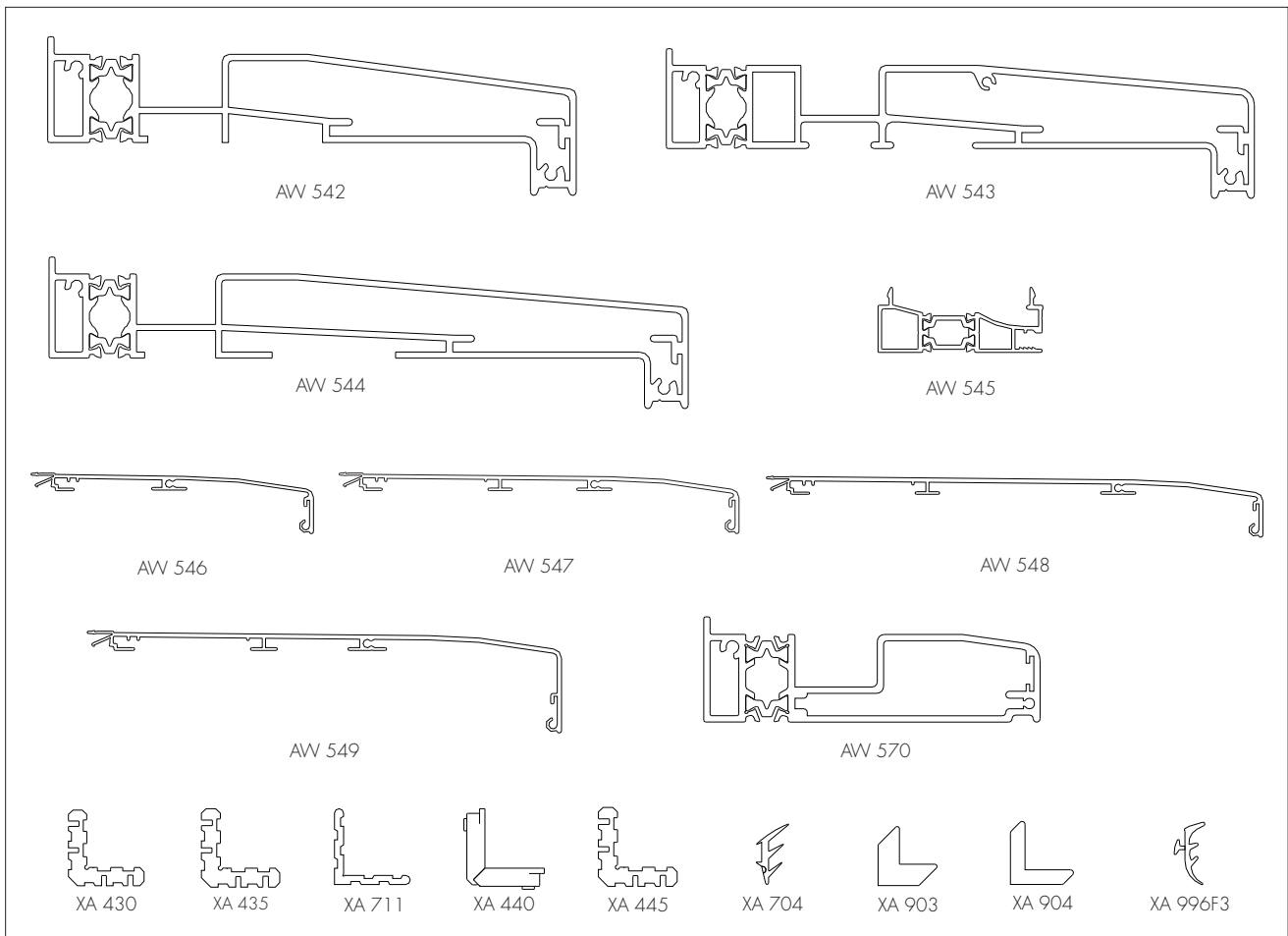


Table 1 Profiles

Manufacturer's	Profile type	Application
AW 600	L	direct fix slim outer frame
AW 601	L	direct fix standard outer frame
AW 602	-	direct fix ovolo outer frame
AW 603	Z	odd leg outer frame
AW 604	L	equal leg slim outer frame
AW 605	L	equal leg standard outer frame
AW 606	h	direct fix deep outer frame
AW 607	h	direct fix ovolo deep outer frame
AW 608	h	direct fix deep equal leg outer frame
AW 650	-	double beaded direct fix slim outer frame
AW 651	-	double beaded direct fix standard outer frame
AW 653	-	double beaded odd leg outer frame
AW 654	-	double beaded equal leg slim outer frame
AW 655	-	double beaded equal leg standard outer frame
AW 656	-	double beaded direct fix deep outer frame
AW 658	-	double beaded direct fix deep equal leg outer frame
AW 631	T	slim transom/mullion
AW 632	T	slim flat transom/mullion
AW 633	T	wide transom/mullion
AW 634	T	wide flat transom/mullion
AW 635	T	window midrail
AW 641	-	double beaded slim flat transom/mullion
AW 643	-	double beaded wide flat transom/mullion
AW 644	-	double beaded window midrail
AW 610	Z	external glazed feature vent
AW 611	Z	external glazed Euro feature vent
AW 612	Z	external glazed ovolo vent
AW 613	Z	external glazed Euro ovolo vent
AW 614	T	internal glazed flat vent
AW 615	T	internal glazed feature vent

*Table 1 Profiles (continued)*

Manufacturer's	Profile type	Application
AW 616	T	internal glazed Euro feature vent
AW 617	T	internal glazed ovolo vent
AW 618	T	internal glazed Euro ovolo vent
AW 619	T	internal glazed commercial vent
AW 620	T	internal glazed Euro commercial vent
AW 624	Z	external glazed flat vent
AW 513	-	28 mm glazing bead
AW 514	-	32 mm glazing bead
AW 517	-	fixed glazing bead
AW 660	-	28 mm square bead
AW 661	-	rebate bead
AW 663	-	flat internal glazed vent bead
AW 664	-	24 mm glazing bead
AW 665	-	36 mm glazing bead
AW 666	-	44 mm glazing bead
AW 668	-	32 mm square bead
AW 542	-	150 mm x 25 mm drop nose sill
AW 543	-	177 mm x 20 mm drop nose sill
AW 544	-	190 mm x 25 mm drop nose sill
AW 545	-	2 part sill back
AW 546	-	190 mm sill nose
AW 547	-	245 mm sill nose
AW 548	-	290 mm sill nose
AW 549	-	260 mm sill nose
AW 570	-	95 mm sill
XA 430	-	14 mm cleat
XA 435	-	5.1 mm cleat
XA 711	-	14.2 mm cleat
XA 440	-	14 mm mechanical cleat
XA 445	-	mechanical cleat pin
XA 704	-	weatherseal
XA 903	-	wide chevron
XA 904	-	narrow chevron
XA 996F3	-	glazing gasket

*Table 2 Size restriction*

	Dimension (mm)
<b>Outward opening windows</b>	
Maximum length of mullions or transoms	1389
Maximum overall width or height of any outer frame	2100
<i>Top-hung opening lights</i>	
Maximum size of top-hung opening light <sup>(1)</sup> (separately or in a multilight)	1200 wide x 1200 high
<i>Side-hung opening lights</i>	
Maximum size of side-hung opening light <sup>(1)</sup> (separately or in a multilight)	700 wide x 1289 high
<b>Fixed lights</b>	1500 wide x 2400 high

## Fittings

1.8 For outward opening windows 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 10088-1 : 2005. 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 locking systems constructed from chromated zinc-plated mild steel, operated by a handle. The keeps are made from zinc-based alloy or other materials approved by the BBA.

1.9 Espagnolette handles are available, as an option, with a key locking facility. The espagnolette and keeps are fixed by means of self-tapping screws which penetrate the profile wall. The espagnolette handles are formed from zinc-based alloy with various finishes.

1.10 Details of currently approved types of hinges and locking mechanisms can be obtained from the BBA. Additional components are available from the range of fittings to restrict the opening of the window to a maximum distance of 100 mm.

## Glazing

1.11 Windows are supplied factory glazed or ready for glazing using double-glazed units with glass thicknesses in accordance with BS 6262-1 : 2005. All glass is positioned by plastic setting blocks and packing pieces.

## Weatherstripping and gaskets

1.12 Gaskets and weatherstripping, manufactured from a thermoplastic elastomer, are fitted into grooves in the profiles (see Figure 1). The double-glazed unit is secured by a bead with a glazing gasket.

## Quality control

1.13 Quality control checks are carried out on the incoming materials during production and on the finished products.

## 2 Delivery and site handling

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

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

2.3 The weight of glazing can be calculated, where required for manual handling operations, by reference to the information contained in BS 952-1 : 1995. The weight of the unglazed frame, and its ease of handling, particularly by one person, must also be taken into account when planning site operations.

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

# Assessment and Technical Investigations

The following is a summary of the assessment and technical investigations carried out on the Beaufort Advanced Plus Outward Opening Aluminium Window System.

## Design Considerations

### 3 Use

The Beaufort Advanced Plus Outward Opening Aluminium Window System is satisfactory for use as windows installed vertically into the external walls of buildings.

### 4 Practicability of installation

4.1 Installation does not present undue difficulty when fitting the windows in openings in new or existing walls provided the installation instructions are followed.

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

### 5 Thermal insulation


 5.1 The thermal transmittance (U value) of the window (1480 mm high by 1230 mm wide), incorporating a side hung next to a fixed light, when calculated to BS EN ISO 10077-2 : 2003, is shown in Table 3 and may be used in SAP or SBEM calculations.

Table 3 Calculated window U values

Window U value	Glazing				Spacer
	Dimensions (mm)	Type	$\epsilon$	Cavity gas	Type
1.9	4/20/4	Optiwhite/Optitherm S3	0.03	90% argon	Aluminium
1.6	4/20/4	Optiwhite/Optitherm S3	0.03	90% argon	Edgetech Superspacer

5.2 The overall thermal insulation of the window will be dependent on the performance of the glazing units. For units other than those described in Table 3, the indicative U values shown in Table 6e of SAP 2005 *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 : 2000, or calculation to BS EN ISO 10077-1 : 2000 or BS EN ISO 10077-2 : 2003 should be used in preference to the data given in Table 6e.

5.3 It is recommended that glazing units which meet the requirements of BS EN 1279-2 : 2002 and BS EN 1279-3 : 2002 (if relevant) are specified.

5.4 Windows should be installed to minimize heat loss around openings. Suitable design criteria are described in BRE report (BR 262 : 2002) *Thermal insulation : avoiding risks* for existing buildings; and the following documents for new buildings.

## 6 Weathertightness

6.1 Selected samples from the system were tested in accordance with BS 4873 : 2002 and BS 6375-1 : 2004. Assessment of the results shows that the windows, within the range described in section 1.7, are suitable for use where the classifications defined in Table 4 are applicable. The classifications are based on the assumption that the outer frame is supported on all four sides in accordance with the manufacturer's instructions.


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

Table 4 Test pressure class and classification

	Maximum test pressure (Pa)	Classification according to		
		BS EN 12207	BS EN 12208	BS EN 12210
<i>Strength and stability</i>				
Fixed or single opening lights <sup>(1)</sup>	3600 (P3)	–	–	Class E2400
Multilights with mullions and transoms up to a maximum of 1389 mm	3000 (P3)	–	–	Class E2400
<i>Watertightness</i>				
Fixed lights <sup>(1)</sup>	750	–	Class E750	–
Opening lights <sup>(1)</sup>	600	–	Class 9A	–
Multilights with mullions and transoms up to a maximum of 1389 mm	300	–	Class 7A	–
<i>Air permeability</i>				
Fixed lights <sup>(1)</sup>	700	Class 4	–	–
Opening lights <sup>(1)</sup>	700	Class 4	–	–
Multilights with mullions and transoms up to a maximum of 1389 mm	600	Class 4	–	–

(1) Results taken from Advanced window range, Advanced Plus window system is believed to achieve the same classification.

## 7 Ventilation

 7.1 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.


7.2 The background ventilation requirements of the various building regulations can be met by the incorporation in the window of a suitably-sized trickle ventilator. The ventilator may be glazed in, fitted in a supplementary head member or fitted by another method approved by the BBA. Details of any such approved fitting methods can be obtained from the BBA and details of ventilators covered by an Agrément Certificate can be found on the BBA website.

## 8 Basic security against intrusion


8.1 Opening lights are fitted with lock mechanisms as described in sections 1.8 and 1.9. When fastened in the closed position the opening light cannot be opened by manipulation from the outside, for example, by the insertion of a thin blade. For new build work, the security requirements of NHBC Standards 2008, Chapter 6.7 *Doors, windows and glazing* and the *Zurich Building Guarantee Technical Manual 2008, Section 4 Superstructure, Sub-section External walls — doors, windows and roof lights* (page 175) should be referred to.

8.2 Externally-fitted glazing beads are extremely difficult to remove due to the way the beads are glazed-in. Glazing beads are specially cut in accordance with the *Beaufort Fabrication Manual* and scribed into place. An additional security feature is that slide-in glazing gaskets are used rather than conventional push-in designs, making access to the gasket for removal extremely difficult.

## 9 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 each applicable feature, for example, a fixed light would require twice the outer frame dimension to be deducted from the overall width and overall height.

## 10 Condensation risk

 10.1 The windows obtain similar temperature factors to PVC-U windows, for which experience has shown, in normal domestic or similar applications that they do not constitute a significant risk of surface condensation.

10.2 Windows should be installed to minimize cold bridging on sills, jambs and head sections. Suitable design criteria are described in the documents referred to in section 5.4.

## 11 Safety



11.1 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.

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

11.3 Account must be taken of the recommendations given in BS 6262-4 : 2005<sup>(1)</sup>, which includes the use of safety glass, complying with BS EN 12600 : 2002 or BS 6206 : 1981, under certain circumstances.

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

## 12 Ease of operation

The window can be operated without difficulty when correctly installed.

## 13 Maintenance



13.1 The window can be re-glazed and the gaskets and weatherstripping replaced, but these operations should be carried out by specialist operatives using the materials recommended by the Certificate holder and approved by the BBA. If a glazing bead is fitted and the gasket is damaged, for example during re-glazing, it may be necessary to replace the complete bead. Replacements are available from the Certificate holder.

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

13.3 The powder-coated aluminium frame members can be cleaned using water containing mild household detergent. If dirt is allowed to build up on the members over long periods it may become more difficult to restore the surface appearance.

13.4 Care should be taken when using proprietary materials for cleaning the glass, to ensure that deposits are not allowed to remain on the painted finish 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.

13.5 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. The resistance of the sliders can be adjusted, if necessary, with the brass screw or die-cast, slot-headed cam provided in each slider.

## 14 Durability



14.1 Aluminium window frames will perform effectively with an anticipated life of at least 40 years.

14.2 The polyester powder coating will have a decorative life of at least 15 years in industrial areas and of at least 20 years in other areas.

14.3 Fittings, including the hinges, locking mechanism and operating handles, as described in this Certificate, will have similar durability except where windows are to be installed in areas subject to particularly aggressive conditions. These conditions can prevail in coastal locations or near sources of industrial pollutants and replacement of fittings may be necessary within the life of the window.

14.4 The gaskets and the mastic seal to the building structure may need to be replaced within the life of the window.

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

## Installation

### 15 General

15.1 Windows for the Beaufort Advanced Plus Outward Opening Aluminium Window System must be fixed into the opening, in accordance with the recommendations in BS 8213-4 : 2007, using proprietary expanding anchors through the frame or galvanized steel fixing lugs.

15.2 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.

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

## 16 Tests

16.1 Tests on the Beaufort Advanced Plus Outward Opening Aluminium Window System were carried out in accordance with the methods defined in BS 6375-1 : 2004, BS 6375-2 : 1987 and BS 4873 : 2004 to determine:

- air permeability
- watertightness
- effect of wind loads
- efficiency of window fittings.

16.2 Tests in accordance with BS EN ISO 2409 : 2007 were carried out on the polyester powder coated paint to determine:

- cross-cut adhesion.

16.3 The thermal transmittance values of an outward opening window was calculated using computer simulation in accordance with BS EN ISO 10077-2 : 2003.

16.4 Tests were carried out on the polyamide thermal break in accordance with BS EN 14024 : 2004 to determine:

- shear strength.

## 17 Investigations

The profile manufacturing process and the window fabrication procedure including, in each case, the methods adopted for quality control, have been examined and found satisfactory by the BBA.

## Bibliography

BS 952-1 : 1995 *Glass for glazing — Classification*

BS 3987 : 1991 *Specification for anodic oxidation coatings on wrought aluminium for external architectural applications*

BS 4873 : 2004 *Aluminium alloy windows*

BS 6206 : 1981 *Specification for impact performance requirements for flat safety glass and safety plastics for use in buildings*

BS 6262-1 : 2005 *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 : 1989 *Performance of windows — Classification for weathertightness (including guidance on selection and specification)*

BS 6375-1 : 2004 *Performance of windows and doors — Classification of weathertightness and guidance on selection and specification*

BS 6375-2 : 1987 *Performance of windows — Specification for operation and strength characteristics*

BS 6496 : 1984 *Specification for powder organic coatings for application and stoving to aluminium alloy extrusions, sheet and preformed sections for external architectural purposes, and for the finish on aluminium alloy extrusions, sheet and preformed sections coated with powder organic coatings*

BS 7412 : 2002 *Plastics windows made from unplasticized polyvinyl chloride (PVC-U) extruded hollow profiles — 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 : 2007 *Windows, doors and rooflights — Code of practice for the survey and installation of windows and external doorsets*

BS EN 755-9 : 2008 *Aluminium and aluminium alloys — Extruded rod/bar, tube and profiles — Profiles, tolerances on dimensions and form*

BS EN 10088-1 : 2005 *Stainless steels — List of stainless steels*

BS EN 12020-1 : 2001 *Aluminium and aluminium alloys — Extruded precision profiles in alloys EN AW-6060 and EN AW-6063 — Technical conditions for inspection and delivery*

BS EN 12020-2 : 2001 *Aluminium and aluminium alloys — Extruded precision profiles in alloys EN AW-6060 and EN AW-6063 — Tolerances on dimensions and form*

BS EN 12206-1 : 2004 *Paints and varnishes — Coating of aluminium and aluminium alloys for architectural purposes — Coatings prepared from coating powder*

BS EN 12207 : 2000 *Windows and doors — Air permeability — Classification*

BS EN 12208 : 2000 *Windows and doors — Watertightness — Classification*

BS EN 12210 : 2000 *Windows and doors — Resistance to wind — Classification*

BS EN 12600 : 2002 *Glass in building — Pendulum test — Impact test method and classification for flat glass*

BS EN 13438 : 2005 *Paints and varnishes — Powder organic coatings for galvanized or sherardised steel products for construction purposes*

## Conditions of Certification

### 18 Conditions

18.1 This Certificate:

- relates only to the product/system that is named and described on the front page
- is granted only to the company, firm or person named on the front page — no other company, firm or person may hold or claim any entitlement to this Certificate
- 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 and documents referred to in this Certificate are those that the BBA deems to be relevant at the date of issue or re-issue of this Certificate and include any: Act of Parliament; Statutory Instrument; Directive; Regulation; British, European or International Standard; Code of Practice; manufacturers' instructions; or any other publication or document similar or related to the aforementioned.

18.3 This Certificate will remain valid for an unlimited period provided that the product/system and the manufacture and/or fabrication including all related and relevant 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 In granting this Certificate, the BBA is not responsible for:

- the presence or absence of any patent, intellectual property or similar rights subsisting in the product/system or any other product/system
- the right of the Certificate holder to manufacture, supply, install, maintain or market the product/system
- individual installations of the product/system, including the nature, design, methods and workmanship of or related to the installation
- the actual works in which the product/system is installed, used and maintained, including the nature, design, methods and workmanship of such works.

18.5 Any information relating to the manufacture, supply, installation, use and maintenance 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 and maintained. It does not purport in any way to restate the requirements of the Health & Safety at Work etc Act 1974, or of any other statutory, common law or other duty which may exist at the date 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. In granting this Certificate, the BBA does not accept responsibility to any person or body for any loss or damage, including personal injury, arising as a direct or indirect result of the manufacture, supply, installation, use and maintenance of this product/system.