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BBA BRITISH BOARD OF AGRÉMENT
TECHNICAL APPROVALS FOR CONSTRUCTION

Fakro Sp. z.o.o.
ul. Węgierska 144a
33–300 Nowy Sącz
Poland
Tel: 00 18 48 444 0444 Fax: 00 18 48 444 0333

Agrément Certificate No 02/3944
*Second issue**

Designated by Government to issue European Technical Approvals

FAKRO THERMO ROOF WINDOWS

Fenêtre pour toit en pente
Dach Fenster

Product

- *THIS CERTIFICATE OF CONFIRMATION RELATES TO FAKRO THERMO ROOF WINDOWS.*
- *The product is manufactured by Fakro Sp. z.o.o. and marketed in the UK by Fakro (GB) Ltd, Studio One, Waterside Court, Third Avenue, Centrum 100, Burton-on-Trent, Staffs DE14 2WQ. Tel: 01283 533666, Fax: 01283 531887.*
- *The product is for use on roofs of domestic and commercial buildings with a pitch between 15° and 90°, to provide natural light and ventilation.*

continued

Regulations — Detail Sheet 1

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

The Secretary of State has agreed with the British Board of Agrément the requirements of the Building Regulations to which roof windows can contribute in achieving compliance. In the opinion of the BBA, Fakro Thermo Roof Windows, if used in accordance with the provisions of this Certificate, will meet or contribute to meeting the relevant requirements.

Requirement:	A1	Loading
Comment:		When installed in accordance with the provisions of this Certificate, the product will have sufficient strength and stiffness to sustain the imposed load. See the tinted areas of the *Structural stability* section of the accompanying Detail Sheet.
Requirement:	B1	Means of escape
Comment:		Where a window in a dwelling is required 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^2 and of a size not less than 450 mm high by 450 mm wide and is positioned as set out in Approved Document B1.

continued

• *It is essential that the product is installed and used in accordance with the conditions set out in the* Design Data *and* Installation *parts of this Certificate.*

These Front Sheets must be read in conjunction with the accompanying Detail Sheet, which provides information on specific roof windows.

Confirmation of a Polish Agrément No AT-15-4350/2000 issued by Instytut Techniki Budowlanej (ITB).

Requirement:	B2	Internal fire spread (linings)
Comment:		The glazing used in Fakro Thermo Roof Windows can be regarded as non-combustible material and, therefore, can be taken as having a Class 0 classification. See the relevant tinted area (10.1) of the *Behaviour in relation to fire* section of the accompanying Detail Sheet.
Requirement:	B4(2)	External fire spread
Comment:		When used in roof windows, unwired glass at least 4 mm thick can be regarded as having an AA designation. See the relevant tinted area (10.2) of the *Behaviour in relation to fire* section of the accompanying Detail Sheet.
Requirement:	C4	Resistance to weather and ground moisture
Comment:		When installed in accordance with this Certificate, the windows will not adversely affect the resistance of the roof to the passage of moisture. See the tinted area of the *Weathertightness* section of the accompanying Detail Sheet.
Requirement:	F1	Means of ventilation
Comment:		Opening roof windows can meet or contribute to meeting the Requirement. See the tinted areas of the *Ventilation* section of the accompanying Detail Sheets.
Requirement:	L1(a)(i)	Dwellings
Requirement:	L2(a)	Buildings other than dwellings
Comment:		In calculating the heat loss through windows, the U values given in the tinted areas of the *Thermal insulation* section of the accompanying Detail Sheet should be used.
Requirement:	N3	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 the relevant tinted area of the *Safety* section of the accompanying Detail Sheet.
Requirement:	N4	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:	Regulation 7	Materials and workmanship
Comment:		The product is acceptable when used in accordance with this Certificate.

2 The Building Standards (Scotland) Regulations 1990 (as amended)

In the opinion of the BBA, Fakro Thermo Roof Windows, if used in accordance with the provisions of this Certificate, will satisfy or contribute to satisfying the various Regulations and related Technical Standards as listed below.

Regulation:	10	Fitness of materials and workmanship
Standard:	B2.1	Selection and use of materials, fittings, and components, and workmanship
Comment:		The product is acceptable when used in accordance with this Certificate.
Regulation:	11	Structure
Standard:	C2.1	Stability
Comment:		When installed in accordance with the provisions of this Certificate, the product will have sufficient strength and stiffness to sustain the imposed loads. See the tinted areas of the *Structural stability* section of the accompanying Detail Sheet.
Regulation:	12	Structural fire precautions
Standard:	D7.1	Fire spread on internal linings
Standard:	D9.1	Fire spread from an adjoining building
Comment:		When used in roof windows, glass at least 4 mm thick is classified as low vulnerability material. See the relevant tinted area (10.3) of the *Behaviour in relation to fire* section of the accompanying Detail Sheet.

Regulation:	**13**	Means of escape from fire, facilities for fire-fighting and means of warning of fire
Standard:	E2.17	Means of escape from fire in a building of purpose sub-group 1A — Escape windows
Standard:	E3.2	Means of escape from fire in a building of purpose sub-group 1B and 1C — Escape windows
Comment:		Windows providing a clear opening area of at least 0.33 m^2 and of a size not less than 450 mm high by 450 mm wide are deemed to satisfy these Standards as escape windows, when suitably located.
Regulation:	**17**	Resistance to moisture
Standard:	G3.1	Resistance to precipitation — Resistance to precipitation
Comment:		When installed in accordance with the provisions stated in this Certificate, the product will not adversely affect the resistance of the roof to the passage of moisture. See the tinted area of the *Weathertightness* section of the accompanying Detail Sheet.
Regulation:	**22**	Conservation of fuel and power
Standard:	J3.1	Buildings in purpose group 1 — Building fabric
Comment:		In calculating the heat loss from a building in connection with the relevant sub-paragraphs of this Standard, the U values given in the tinted areas of the *Thermal insulation* section of the accompanying Detail Sheet should be used.
Regulation:	**23**	Ventilation of buildings
Standard:	K2.1	Ventilation of buildings other than garages
Standards:	K4.1 and K4.2	General ventilation requirements — Natural ventilation
Comment:		Opening roof windows can provide adequate natural ventilation or contribute to its provision. See the tinted areas of the *Ventilation* section of the accompanying Detail Sheet.
Regulation:	**27**	Miscellaneous hazards
Standard:	P2.2	Danger from accident — Collision with glazing
Comment:		Glazing must comply with the details in BS 6262 : 1982 where accidental collision with it is likely. See the relevant tinted area of the *Safety* section of the accompanying Detail Sheet.
Standard:	P2.3	Danger from accident — Cleaning of windows and rooflights
Comment:		Windows installed in buildings in purpose group 1 situated more than 4 m above the adjacent ground must comply with Standard P2.3 regarding access.

3 The Building Regulations (Northern Ireland) 2000

In the opinion of the BBA, the position of Fakro Thermo Roof Windows, if used in accordance with the provisions of this Certificate, will satisfy or contribute to satisfying the various Building Regulations listed below.

Regulation:	**B2**	Fitness of materials and workmanship
Comment:		The product is acceptable when used in accordance with this Certificate.
Regulation:	**C4**	Resistance to ground moisture and weather
Comment:		When installed in accordance with the provisions stated in this Certificate, the product will not adversely affect the resistance of the roof to the passage of moisture. See the tinted area of the *Weathertightness* section of the accompanying Detail Sheet.
Regulation:	**D1**	Stability
Comment:		When installed in accordance with the provisions of this Certificate, the product will have sufficient strength and stiffness to sustain the imposed load. See the tinted areas of the *Structural stability* section of the accompanying Detail Sheet.
Regulation:	**E2**	Means of escape
Regulation:	**E7(1)**	Deemed-to-satisfy provisions for Regulation E2
Comment:		A roof window in a dwelling can contribute to meeting the requirements when it incorporates an opening light providing a clear opening not less than 850 mm by 500 mm and is positioned not more than 1.1 m above the floor.
Regulation:	**E3**	Internal fire spread — Linings
Comment:		The glazing used in Fakro Thermo Roof Windows can be regarded as non-combustible material and therefore can be taken as having a Class 0 classification. See the relevant tinted area (10.1) of the *Behaviour in relation to fire* section of the accompanying Detail Sheet.

Regulation:	E5	External fire spread
Comment:		When used in roof windows, unwired glass at least 4 mm thick can be regarded as having an AA designation. See the relevant tinted area (10.2) of the *Behaviour in relation to fire* section of the accompanying Detail Sheet.
Regulation:	F2	Building fabric
Comment:		In calculating the heat loss through windows, the U value given in the tinted areas of the *Thermal insulation* section of the accompanying Detail Sheet should be used.
Regulation:	H7	Protection from collision with open windows, skylights or ventilators
Regulation:	H8(5)	Deemed-to-satisfy provision for Regulation H7
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:		Opening roof lights can meet or contribute to meeting the requirements of Regulation K2. See the tinted areas of the *Ventilation* section of the accompanying Detail Sheet.
Regulation:	V4	Safe opening and closing of windows, skylights and ventilators
Regulation:	V6(3)	Deemed-to-satisfy provision for Regulation V4
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 the relevant tinted area of the *Safety* section of the accompanying Detail Sheet.
Regulation:	V5	Safe means of access for cleaning glazing
Regulation:	V6(4)	Deemed-to-satisfy provision for Regulation V5
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.

4 Construction (Design and Management) Regulations 1994 (as amended)

Construction (Design and Management) Regulations (Northern Ireland) 1995 (as amended)

Information in this Certificate may assist the client, planning supervisor, designer and contractors to address their obligations under these Regulations.

See section: 3 *Delivery and site handling* (3.4 and 3.5) of Detail Sheet 2.

Bibliography

BS 6262 : 1982 *Code of practice for glazing for buildings*

Conditions of Certification

5 Conditions

5.1 This Certificate:

(a) relates only to the product that is described, installed, used and maintained as set out in this Certificate;

(b) is granted only to the company, firm or person identified on the front cover — no other company, firm or person may hold or claim any entitlement to this Certificate;

(c) is valid only within the UK;

(d) has to be read, considered and used as a whole document — it may be misleading and will be incomplete to be selective;

(e) is copyright of the BBA;

(f) is subject to English law.

5.2 References in this Certificate to any Act of Parliament, Regulation made thereunder, Directive or Regulation of the European Union, Statutory Instrument, Code of Practice, British Standard, manufacturers' instructions or similar publication, are references to such publication in the form in which it was current at the date of this Certificate.

5.3 This Certificate will remain valid for an unlimited period provided that the product and the manufacture and/or fabrication including all related and relevant processes thereof:

(a) are maintained at or above the levels which have been assessed and found to be satisfactory by the BBA;

(b) remain covered by a valid Polish Agrément; and

(c) are reviewed by the BBA as and when it considers appropriate.

5.4 In granting this Certificate, the BBA is not responsible for:

(a) the presence or absence of any patent or similar rights subsisting in the product or any other product;

(b) the right of the Certificate holder to market, supply, install or maintain the product; and

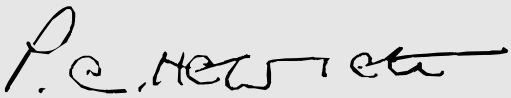
(c) the nature or standard of individual installations of the product or any maintenance thereto, including methods and workmanship.

5.5 Any recommendations relating to the use or installation of this product which are contained or referred to in this Certificate are the minimum standards required to be met when the product is used. They do 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 or in the future; nor is conformity with such recommendations to be taken as satisfying the requirements of the 1974 Act or of any present or future 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 installation and use of this product.

BBA BRITISH BOARD OF AGRÉMENT
TECHNICAL APPROVALS FOR CONSTRUCTION

In the opinion of the British Board of Agrément, Fakro Thermo Roof Windows are fit for their intended use provided they are installed, used and maintained as set out in this Certificate. Certificate No 02/3944 is accordingly awarded to Fakro Sp. z.o.o.

On behalf of the British Board of Agrément



Date of Second issue: 25th June 2004 Chief Executive

**Original Certificate issued on 27th November 2002, but not published. This amended version issued to include increased pitch range to opening and revised* Conditions of Certification.

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British Board of Agrément
P O Box No 195, Bucknalls Lane
Garston, Watford, Herts WD25 9BA
Fax: 01923 665301

e-mail: mail@bba.star.co.uk
website: www.bbacerts.co.uk

CI/SfB
(31.4) Hn6

BBA BRITISH BOARD OF AGRÉMENT
TECHNICAL APPROVALS FOR CONSTRUCTION

Fakro Sp. z.o.o.

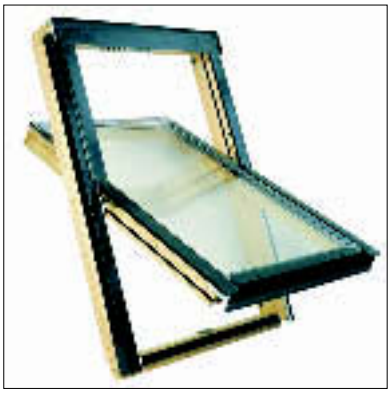
Certificate No 02/3944

DETAIL SHEET 2

*Second issue**

FTP-V ROOF WINDOWS

Product



- *THIS DETAIL SHEET RELATES TO FTP-V ROOF WINDOWS.*
- *The product comprises single-opening roof windows revolving about a centre pivot constructed from a wood core, covered in polyester powder-coated aluminium on the outside and glazed with a sealed, double-glazed low emissivity, argon-filled unit with toughened glass.*
- *The product is for use on roofs with a pitch between 15° and 90°.*
- *The product is for use where the test pressure classes defined in BS 6375-1 : 1989 and indicated in Table 2 are applicable.*
- *It is essential that the windows are installed and maintained in accordance with the conditions set out in the* Design Data *and* Installation *parts of this Detail Sheet.*

This Detail Sheet must be read in conjunction with the Front Sheets, which give the product's position regarding the Building Regulations and the Conditions of Certification.

Technical Specification

1 Description

1.1 FTP-V Roof Windows (see Figures 1 and 2) are fabricated from preserved softwood frames featuring polyester powder-coated aluminium on the external faces and clear water-based acrylic lacquer on the internal faces of the frames and sashes.

1.2 The range comprises single-opening lights revolving about a centre pivot subject to the size restrictions shown in Table 1.

Table 1 Size range

Window code	Modular size width x height (mm)	Outer frame dimensions (mm)		Opening light dimensions (mm)	
		Width	Height	Width	Height
01	550 x 780	545	779	460	689
02	550 x 980	545	979	460	889
03	660 x 980	655	979	570	889
04	660 x 1180	655	1179	570	1089
05	780 x 980	775	979	690	889
06	780 x 1180	775	1179	690	1089
07	780 x 1400	775	1399	690	1309
08	940 x 1180	935	1179	850	1089
09	940 x 1400	935	1399	850	1309
10	1140 x 1180	1135	1179	1150	1089
12	1340 x 980	1135	979	1250	889

1.3 Framing members comprise softwood sections formed by cutting the required profiles from either continuous timber or layer jointed material. The softwood is preservative treated.

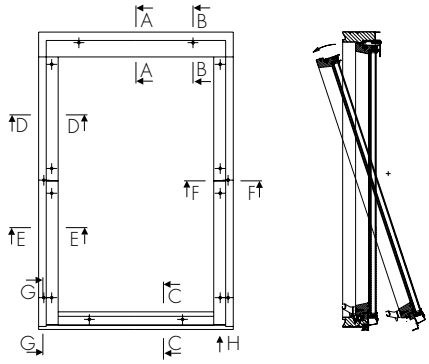
1.4 The aluminium profiles covering the outer and the sash frames and the flashings sealing the joint between the frame and the roof slope are extruded from aluminium sheet type EN AW-1050 A to BS EN 573-3 : 1995 condition H44 to BS EN 515 : 1993. The aluminium sheet is 0.6 mm thick and meets the requirements of BS EN 485-1 : 1994 and is secured to the wood core with stainless steel screws.

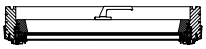
1.5 The polyester powder coating is available in brown finish as standard (other colour finishes are an option) and has a minimum thickness of 25 µm.

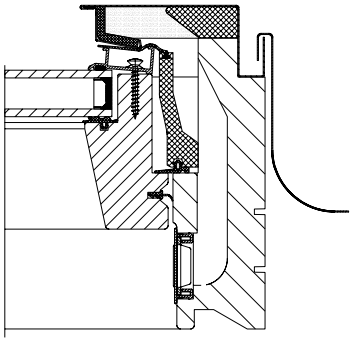
1.6 All windows are factory-glazed using sealed double-glazed units. The units comprise a 4 mm thick outer pane made of toughened glass, a 16 mm argon-filled cavity and a 4 mm thick inner pane made of glass featuring a low emissivity coating.

1.7 Glazing units are sealed into the wooden sash using EPDM gaskets, conforming to DIN 7863 : 1983 on the inside and flexible butyl putty on the outside. The glazing unit is held with steel brackets. The profiles holding the glazing unit at the top and the jambs of the sash are made from aluminium alloy type EN AW-6101 A to BS EN 573-3 : 1995 condition Thd T5 to BS EN 515 : 1993. The profiles holding the glazing unit at the bottom are extruded from aluminium sheet type EN AW-1050 A to BS EN 573-3 : 1995 condition H44 to BS EN 515 : 1993. The aluminium alloy profiles are polyester powder coated (minimum thickness 25 µm).

Figure 1 FTP-V window cross section







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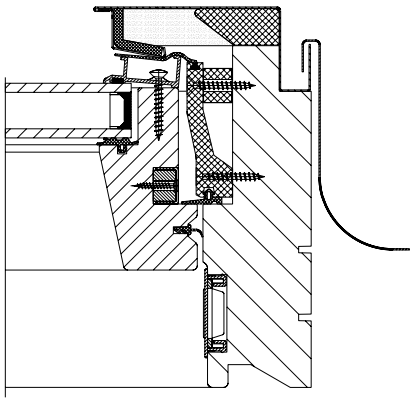

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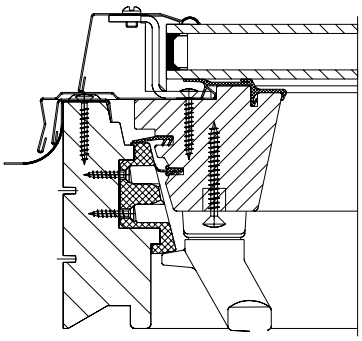

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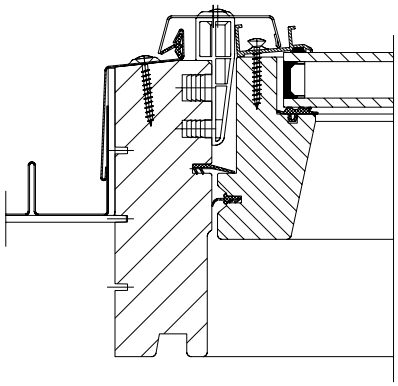

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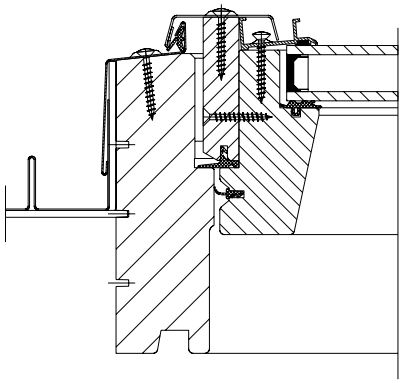

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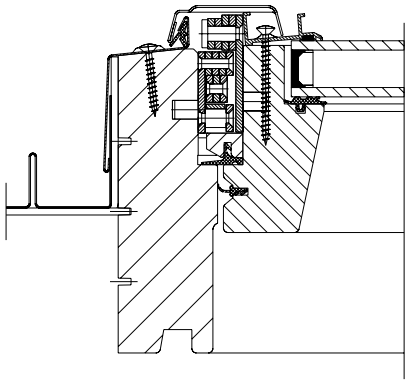
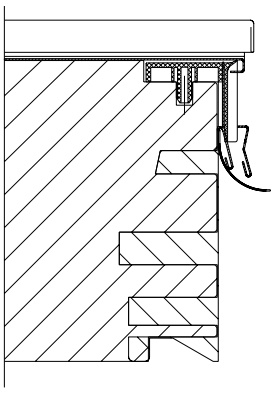


section F–F



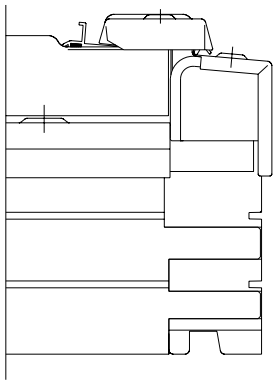
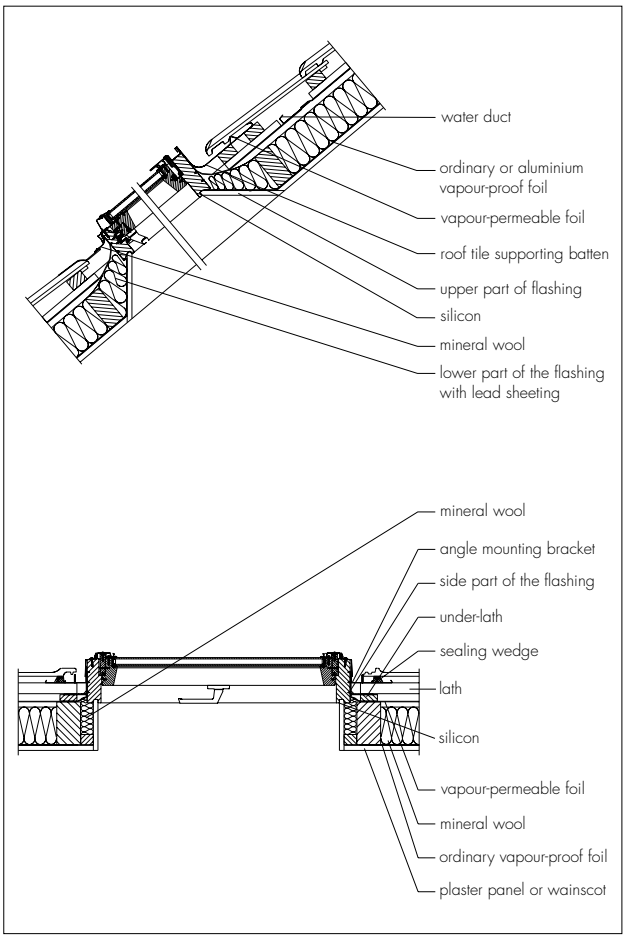


Figure 2 Window placements



1.8 Opening lights are operated by either one or two handles constructed from polyester powder-coated aluminium alloy with a polyester varnish. The centre pivot hinges are constructed from zinc-coated galvanized steel. They allow the sash to be turned through 180° for cleaning and maintenance. A key operated lock can be installed at the bottom of the sash pivot.

1.9 EPDM weatherstripping is located in the grooves around the periphery of the opening light frame below the hinge axis and around the outer frame above the hinge axis. The weatherstripping above the hinge axis is fixed using special cover strips screwed to the frame. The weatherstripping below the hinge axis is fixed to the jambs of the opening light, using cover strips screwed to the jambs. The weatherstripping is pressed into the special groove in the bottom member of the opening light and secured using stainless steel staples.

1.10 The windows are equipped with hit and miss ventilation inlets, made from aluminium alloy type EN AW-61-1 A to BS EN 573-3 : 1995 fitted in the top member of the outer frame.

2 Manufacture

2.1 The cores of the window framing members are profiled from softwood and treated with preservative. Members of the outer frames and sashes are glued at the corners and additionally joined with quadruple and triple tenons respectively. External profiles are covered with aluminium sections which are secured with stainless steel screws.

2.2 In-process quality control includes checks on:

- timber quality
- quality and strength of glue laminated wood
- preservative treatment
- dimensions
- operation
- colour.

3 Delivery and site handling

3.1 The windows are delivered to site ready glazed. For transportation they are suitably protected in cardboard boxes to avoid damage.

3.2 Each window has a label bearing the company's mark and the BBA identification mark incorporating the number of this Certificate.

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

3.4 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 roof window, and its ease of handling, particularly by one person, must also be taken into account when planning site operations.

3.5 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.

Design Data

4 General

4.1 FTP-V Roof Windows are suitable for use on roofs of domestic or commercial buildings with a pitch between 15° and 90°. Roofs should be designed in accordance with BS 6229 : 1982.

4.2 The roof windows are suitable for most existing roofs but it is important that the roof is checked by a suitably-qualified person to ensure that the possible removal of roof supporting members will not cause any problems and that it can bear any possible additional loads imposed upon it by the installation of the roof windows.

4.3 The windows are suitable for replacing existing roof windows.

5 Practicability of installation

Installation does not present undue difficulty when fitting the windows in openings in new or existing

roofs provided the installation instructions are followed.

6 Structural stability

6.1 The product can be selected to have adequate resistance to wind loads calculated in accordance with CP 3 : Chapter V-2 : 1972 or BS 6399-2 : 1997.

6.2 The windows have been tested to a maximum imposed load of 1700 Nm^{-2}. The magnitude of the actual snow load imposed will depend upon a number of factors, such as height above sea level, geographical location and roof arrangement. Therefore, it is recommended that BS 6399-3 : 1988 is used to calculate the actual snow load when the roof is used in situations where a load greater than 1700 Nm^{-2} can be expected.

6.3 Details of connections between the roof window and the roof must be entrusted to a suitably-qualified person. Guidance is available from the Certificate holder or its agent.

7 Weathertightness

7.1 When installed in accordance with the manufacturer's instructions and sections 16 and 17, the windows will provide a weatherproof construction.

7.2 Selected samples from the windows were tested generally in accordance with BBA MOAT No 1 : 1974. Assessment of the results shows that the products, within the range described in section 1.2, are suitable for use where the test pressure classes defined in BS 6375-1 : 1989 and indicated in Table 3 are applicable. The gradings are based on the assumption that the outer frame is supported in accordance with the manufacturer's instructions.

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 2 Test pressure class

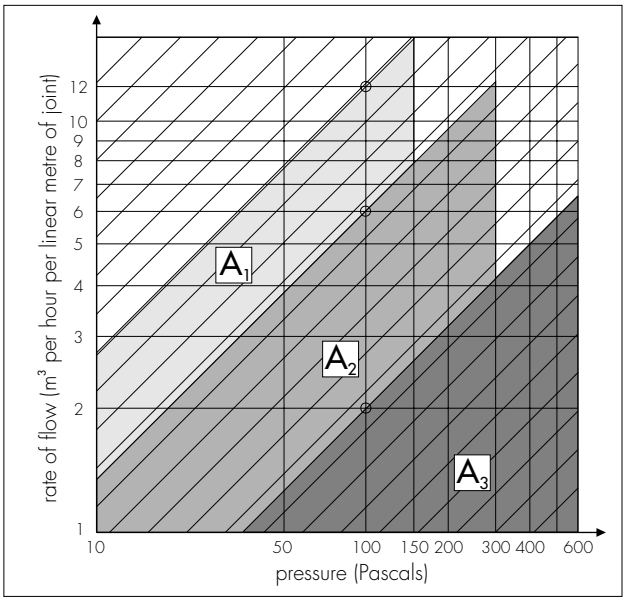
	BS 6375-1 : Test pressure class (Pa)	BS EN 12207 and BS EN 12208	MOAT No 1 Grading
Watertightness			
Installation at 15°	–	class 4A (150 Pa)	–
Installation at 20°	300	–	E_3
Installation at 30°	300	–	E_4
Installation at 90°	–	class 7A (300 Pa)	–
Air permeability			
Vent sealed	600	class 4	A_3

E_3 indicates water leakage occurring between 300 Pa and 499 Pa.

E_4 indicates no water leakage occurring at a differential pressure of 500 Pa.

A_3 indicates an airflow rate below the line passing the point for a rate of flow of 2 m^3h^{-1} at 100 Pa pressure, when tested up to a pressure of 600 Pa (see Figure 3).

Figure 3 Air permeability grade



8 Glass area

The approximate glass area of the windows is given in Table 3.

Table 3 Approximate glass area

Window code	Glass area (m^2)
01	0.21
02	0.29
03	0.38
04	0.47
05	0.47
06	0.59
07	0.72
08	0.75
09	0.92
10	0.94
12	0.91

9 Ventilation

9.1 The approximate opening area for rapid natural ventilation is given in Table 4.

Table 4 Approximate opening area for rapid natural ventilation

Window code	Opening area for natural ventilation (m^2)
01	0.32
02	0.41
03	0.51
04	0.62
05	0.61
06	0.75
07	0.90
08	0.92
09	1.11
10	1.25
12	1.11

9.2 The background ventilation requirements of the various Building Regulations can be met by the adjustable trickle vents incorporated in the roof windows.

10 Behaviour in relation to fire

10.1 The glazing used in the windows can be regarded as non-combustible material and therefore can be taken as having a Class 0 classification.

10.2 When used in roof windows, unwired glass at least 4 mm thick can be regarded as having an AA designation.

10.3 When used in roof windows, glass at least 4 mm thick is classified as low vulnerability material.

11 Thermal insulation

The thermal transmittance value (U value) of the window, 1135 mm wide by 1400 mm high, incorporating a central pivot opening light and glazed with a 4/16/4 mm sealed, double-glazed unit with Silverster 1.1 low-E soft-coated glass as the inner pane and argon-filled cavity, when measured by the Guarded Hot Box Method according to prEN ISO 12567-2 : 2004, is 1.5 $Wm^{-2}k^{-1}$.

12 Condensation risk

Experience of window systems similar to the FTP-V Roof Windows has shown that, in normal domestic or similar applications, roof windows do not constitute a significant condensation risk when correctly installed. Guidance on some satisfactory design details is given in *Limiting thermal bridging and air leakage : robust construction details for dwellings and similar buildings*, TSO, 2002. Further information is contained in BRE Digest 262 : 2002 *Thermal insulation: avoiding risks.*

13 Safety

13.1 The windows can comply with the recommendations of BS 8213-1 : 1991 with regard to the positioning of hand operated controls.

13.2 Account must be taken of the recommendations given in BS 6262-4 : 1994, which include the use of safety glass, complying with BS 6206 : 1981, under certain circumstances.

14 Security against intrusion

14.1 The opening lights are fitted with a lock mechanism as described in section 1.8. 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. In addition key operated locks, which are required for certain windows to meet the security requirements of NHBC Standards Chapter 6.7 *Doors, windows and glazing* and the Zurich Building Guarantees Technical Standards, Sections 6.12 and 12.16 are available.

14.2 The arrangement of the aluminium cladding and glazing retaining profiles with screw fixings ensures that removal of the glass is difficult.

15 Ease of operation

The window can be operated without difficulty when correctly installed.

16 Maintenance

16.1 The window can be re-glazed and the gaskets, putty and weatherstripping replaced, but these operations should be carried out by the UK representative of the Certificate holder specified on the Front Sheets and approved by the BBA.

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

16.3 The external glazing and external frame members can be cleaned using water containing 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.

16.4 The external pane of the glazing unit can be cleaned from inside the building.

16.5 Care should be taken when using proprietary materials for cleaning the glass, to ensure that deposits are not allowed to remain on the wood or aluminium surfaces 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.

16.6 The pivot hinges and locking mechanism should be lubricated periodically to minimise wear and to ensure smooth operation.

17 Durability

17.1 The windows are constructed from preservative-treated softwood, which is covered by aluminium cladding. Therefore, the life of the roof windows is expected to be at least equal to conventional timber windows. Any slight external colour change or surface dulling of the aluminium cladding that might occur will be uniform over the visible surfaces of the windows.

17.2 Fittings, including the pivot hinges and locking handles, as described in this Detail Sheet, 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.

17.3 The gaskets and weatherstripping may need to be replaced within the life of the window.

Installation

18 General

18.1 The window must be fixed into the opening, in accordance with the recommendations in the *Fakro Instructions for Fitting Roof Window to Rafters*, using angled anchors, made from zinc-coated, galvanized steel, fixed to the window frame and rafters or battens. The window may be installed at any point above floor level (subject to Building Regulations approval), but consideration must be given to ease of operation.

18.2 With suitable propping, it is normally acceptable to cut out one rafter and form a trimmed opening. Where more extensive cutting of structural members is proposed or in any case of doubt, appropriately qualified and experienced persons should be consulted.

18.3 When preparing the opening to accept the roof window, a tolerance of 10 mm to 50 mm should be allowed.

18.4 The window must be installed above a complete row of tiles or slates, as these must not be cut under the window. In the case of metal roof sheets or similar, the window must be installed above a horizontal lap. In the case of corrugated roof sheets or high profile tiles or slates, it is recommended that the upper edge of the roofing material is cut (tiles or slates) or flattened (metal roof sheets or similar) under the edge of the window.

18.5 When installing the window, the following distances between the edge of the window and tiles must be maintained:

- at bottom edge of window 0—40 mm for flat tiles (eg slates)
  80—100 mm for tiles over 8 mm thick
  90—120 mm for corrugated sheets
- at sides of window 30—60 mm
- at top edge of window 60—150 mm

18.6 The window aperture should be marked on the roofing felt. When cutting away the roofing material a 100 mm flap should be allowed all around to provide a waterproof dpc. The battens are cut out where the window is to be fitted. A roof gutter is installed above the position of the window after cutting out a section of counter batten and cutting the felt diagonally.

18.7 The window is fitted using four angle brackets or six brackets for windows over 1400 mm high. The optimum spacing between the rafters should be close to the width of the window and can be 20 mm to 50 mm larger than it. In the case of a roof having a different spacing between the rafters, or if the roof is constructed on bidding rafters, additional timber support must be provided.

18.8 The laths or roof boarding is cut, where the window is to be fitted, to the width of the window plus 20 mm to 50 mm and to the height of the window plus 20 mm to 50 mm.

19 Procedure

Preparation of the window

19.1 The opening light frame, the side mounting supports are removed and the lower support is unscrewed from the casing in accordance with the manufacturer's instructions.

19.2 The supplied angle mounting brackets are fixed to the jambs of the outer frame approximately 100 mm from the corners in accordance with the manufacturer's instructions.

Mounting the casing on the roof

19.3 The casing is fitted into the prepared opening in the roof ensuring that it lies horizontally using a spirit level.

19.4 The lower angle brackets are screwed onto the rafters or battens and the opening light frame is fitted into the casing in accordance with the manufacturer's instructions and the top angle brackets are screwed onto the rafters.

19.5 The felt/dpm is secured around the roof window.

19.6 Installation is completed by fixing the appropriate flashings in accordance with the manufacturer's instructions.

Technical Investigations

The following is a summary of the technical investigations carried out on FTP-V Roof Windows.

20 Tests

20.1 Tests were carried out by ITB and Centre Scientifique et Technique du Bâtiment (CSTB) (generally in accordance with the methods defined in MOAT No 1 : 1974) to determine:

- air permeability
- watertightness
- effect of wind loads
- effect of thermal differential
- efficiency of window fittings
- mechanical loading tests
- ease of operation.
- basic security test

20.2 The thermal transmittance value of the window was measured using the Guarded Hot Box Method.

20.3 Additional test work in accordance with MOAT No 1 : 1974 was carried out by the BBA to determine:

- mechanical loading
- endurance of fittings
- basic security test.

21 Investigations

The 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 ITB.

Bibliography

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

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

BS 6229 : 1982 *Code of practice for flat roofs with continuously supported coverings*

BS 6262-4 : 1994 *Glazing of buildings — Codes of practice for safety — Human impact*

BS 6375-1 : 1989 *Performance of windows — Classification for weathertightness (including guidance on selection and specification)*

BS 6399-2 : 1997 *Loading for buildings — Code of practice for wind loads*
BS 6399-3 : 1988 *Loading for buildings — Code of practice for imposed roof loads*

BS 8213-1 : 1991 *Windows, doors and rooflights — Code of practice for safety in use and cleaning of windows and doors (including guidance on cleaning materials and methods)*

BS EN 485-1 : 1994 *Aluminium and aluminium alloys — Sheet, strip and plate — Technical conditions for inspection and delivery*

BS EN 515 : 1993 *Aluminium and aluminium alloys — Wrought products — Temper designations*

BS EN 573-3 : 1995 *Aluminium and aluminium alloys — Chemical composition and form of wrought products — Chemical composition*

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

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

prEN ISO 12567-2 : 2004 *Thermal performance of windows and doors — Determination of thermal transmittance by hot box method — Part 2 : Roof windows and other projecting windows*

CP 3 : 1972 *Code of basic data for the design of buildings — Chapter V-2 Loading — Wind loads*

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On behalf of the British Board of Agrément

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British Board of Agrément
P O Box No 195, Bucknalls Lane
Garston, Watford, Herts WD25 9BA
Fax: 01923 665301

e-mail: mail@bba.star.co.uk
website: www.bbacerts.co.uk