



Bauder Ltd

Broughton House
Broughton Road
Ipswich
Suffolk IP1 3QR

Tel: 01473 257671 Fax: 01473 250194
e-mail: systems@bauder.co.uk
website: www.bauder.co.uk

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**Agrément
Certificate
No 05/4279**

Designated by Government
to issue
European Technical
Approvals

EUROGLAZE ROOFLIGHTS AND UPSTANDS

Lucarne
Dachoberlicht

Product



• THIS CERTIFICATE RELATES TO EUROGLAZE ROOFLIGHTS AND UPSTANDS.


• The rooflights and upstands are for use on flat roofs of domestic and commercial buildings, to provide natural light and ventilation.

• It is essential that the rooflights and upstands are 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 Sheets, which provide information specific to particular rooflights and upstands.

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 plastic rooflights can contribute in achieving compliance. In the opinion of the BBA, Euroglaze Rooflights and Upstands, 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 design load (see the tinted areas in the <i>Strength and stability</i> section of these Front Sheets and the accompanying Detail Sheets).
Requirement: B2	Internal fire spread (linings)
Comment:	The rooflights can be classified as Tp(a) rigid material. See the tinted areas in the <i>Behaviour in relation to fire</i> section of these Front Sheets.
Requirement: B4(2)	External fire spread
Comment:	The rooflights can be taken as classified Tp(a) material. See the tinted areas in the <i>Behaviour in relation to fire</i> section of these Front Sheets.
Requirement: C2(b)	Resistance to moisture
Comment:	When installed in accordance with this Certificate, the rooflights will not adversely affect the resistance of the roof to the passage of moisture. See the tinted areas in the <i>Weathertightness</i> section of these Front Sheets.

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Requirement: C2(c)	Resistance to moisture
Comment:	The risk of surface condensation will depend on the environmental conditions. When fitted, ventilators incorporated in the upstands will provide air flow to alleviate surface condensation on the rooflights. See the tinted areas in the <i>Condensation risk</i> section of these Front Sheets.
Requirement: F1	Means of ventilation
Comment:	When fitted, ventilators incorporated in the upstands can meet or contribute to meet the Requirement. See the tinted area in the <i>Ventilation</i> section of these Front Sheets.
Requirement: L1(a)(i)	Dwellings
Comment:	<p>The U values of some rooflights and upstands exceed the standard values for the Elemental Method of demonstrating compliance to limiting the heat loss through the fabric of the building and, therefore, an alternative method should be used in these cases.</p> <p>When using the Target U value Method or Carbon Index Method, the data given in the tinted areas in the <i>Light transmittance and solar heat gain</i> and <i>Thermal insulation</i> sections of these Front Sheets may be used to determine solar gain and heat losses.</p>
Requirement: L2(a)	Buildings other than dwellings
Comment:	<p>Single-skin rooflights and uninsulated metal upstands should only be used on buildings exempt under Schedule 2.</p> <p>Reasonable provision is provided by the insulation of the insulated upstands.</p> <p>The U values of some rooflights exceed the standard value for the Elemental Method of demonstrating compliance to limiting the heat losses and gains through the fabric of the building. The maximum area of rooflights in these cases must be less than the relevant maximum area given in Approved Document L2, Table 2, when this method of demonstrating compliance is used. See the relevant tinted area (14.4) in the <i>Thermal insulation</i> section of these Front Sheets.</p> <p>When using the Whole-building Method or the Carbon Emissions Calculation Method, the data given in the tinted area of the <i>Light transmittance and solar heat gain</i> section and the relevant tinted areas (14.1 to 14.3) in the <i>Thermal insulation</i> section of these Front Sheets may be used to determine solar heat gain and heat losses.</p>
Requirement: Regulation 7	Materials and workmanship
Comment:	The product is acceptable when used in accordance with this Certificate. See the tinted areas in the <i>Durability</i> section of these Front Sheets.

2 The Building (Scotland) Regulations 2004



In the opinion of the BBA, Euroglaze Rooflights and Upstands, if used in accordance with the provisions of this Certificate, will satisfy or contribute to satisfying the various Regulations and related Mandatory Standards as listed below.

Regulation: 8	Fitness and durability of materials and workmanship
Regulation: 8(1)	Fitness and durability of materials and workmanship
Comment:	The product can contribute to a construction satisfying this Regulation. See the tinted area in the <i>Durability</i> section of these Front Sheets and in addition the <i>Installation</i> part of the accompanying Detail Sheets.
Regulation: 8(2)	Fitness and durability of materials and workmanship
Comment:	The product can contribute to a construction satisfying this Regulation. See the tinted area in the <i>Maintenance</i> section of these Front Sheets.
Regulation: 9	Building standards — construction
Standard: 1.1(b)	Structure
Comment:	When used in accordance with the provisions of this Certificate, the product will have sufficient strength and stiffness to sustain design loads. See the tinted areas of the <i>Strength and stability</i> section of these Front Sheets and the accompanying Detail Sheets.
Standard: 2.5	Internal linings
Comment:	The rooflights can be classified as Tp(a) rigid material with reference to clause 2.5.4 ⁽¹⁾⁽²⁾ . See the tinted areas of the <i>Behaviour in relation to fire</i> section of these Front Sheets.

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Standard:	2.8	Spread from neighbouring buildings
Comment:		The polycarbonate sheets used externally in the rooflights have been assessed as 'low vulnerability' with reference to clause 2.8.2 ⁽¹⁾⁽²⁾ . See the tinted areas in the <i>Behaviour in relation to fire</i> section of these Front Sheets.
Standard:	3.10	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 with reference to clause 3.10.6 ⁽¹⁾⁽²⁾ . See the tinted areas in the <i>Weathertightness</i> section of these Front Sheets.
Standard:	3.14	Ventilation
Comment:		Trickle ventilation with reference to clauses 3.14.2 ⁽¹⁾⁽²⁾ , 3.14.3 ⁽¹⁾⁽²⁾ and 3.14.5 ⁽¹⁾ , can be provided as described in the tinted area in the <i>Ventilation</i> section of these Front Sheets.
Standard:	3.15	Condensation
Comment:		With reference to clause 3.15.3 ⁽¹⁾ the risk of surface condensation will depend on the environmental conditions. When fitted, ventilators incorporated in the upstands will provide air flow to alleviate surface condensation on the rooflights. See the tinted areas in the <i>Condensation risk</i> section of these Front Sheets.
Standard:	3.16	Natural lighting
Comment:		In calculating the contribution of the system to natural lighting with reference to clause 3.16.3 ⁽¹⁾ to this Standard, the area of glazing given in the Tables in the <i>Thermal properties</i> section of the accompanying Detail Sheets can be used.
Standard:	4.8(c)	Danger from accidents
Comment:		The provisions described in clauses 4.8.3 ⁽¹⁾⁽²⁾ to this Standard regarding the safe cleaning of rooflights, must be taken into account.
Standard:	6.2	Building insulation envelope
Comment:		Single skin rooflights and uninsulated upstands should only be used in exempted buildings covered by clause 6.0.2 ⁽¹⁾⁽²⁾ . With regard to clause 6.0.4 ⁽¹⁾⁽²⁾ , the calculated thermal transmittance U values of the rooflights and upstands given in the relevant Tables in the accompanying Detail Sheets can be used. With regard to clause 6.0.10 ⁽¹⁾⁽²⁾ , the rooflight areas should be taken as the area of the opening, measured internally from reveal to reveal. See the relevant tinted area (14.4) in the <i>Thermal insulation</i> section of these Front Sheets. The product U values exceed the maximum permitted by the Elemental Method described in clause 6.2.1 ⁽¹⁾⁽²⁾ and therefore an alternative method of compliance must be used. See the relevant tinted area (14.4) in the <i>Thermal insulation</i> section. All the upstands exceed the maximum U values permitted by clauses 6.2.2 ⁽¹⁾ and 6.2.3 ⁽¹⁾ and some of the upstands exceed the maximum U values permitted by clauses 6.2.2 ⁽²⁾ and 6.2.3 ⁽²⁾ , and in such cases, they may only be used with additional insulation. The data given in the relevant tinted areas of <i>Light transmittance and solar heat gain</i> and <i>Thermal insulation</i> sections of these Front Sheets may be used in connection with these clauses. (1) Technical Handbook (Domestic). (2) Technical Handbook (Non-Domestic).

3 The Building Regulations (Northern Ireland) 2000



In the opinion of the BBA, Euroglaze Rooflights and Upstands, if used in accordance with the provisions of this Certificate, will satisfy or contribute to satisfying the various Building Regulations as listed below.

Regulation:	B2	Fitness of materials and workmanship
Comment:		The product is acceptable when used in accordance with this Certificate. See the tinted areas of the <i>Durability</i> section of these Front Sheets.
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 areas in the <i>Weathertightness</i> section of these Front Sheets.
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 design loads (see the tinted areas of the <i>Strength and stability</i> section of these Front Sheets and the accompanying Detail Sheets).

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Regulation:	E4	Internal fire spread — Structure
Comment:		The rooflights can be classified as Tp(a) rigid material. See the tinted areas of the <i>Behaviour in relation to fire</i> section of these Front Sheets.
Regulation:	E5	External fire spread
Comment:		The rooflights can be classified as Tp(a) rigid material. See the tinted areas of the <i>Behaviour in relation to fire</i> section of these Front Sheets.
Regulation:	F2	Building fabric
Comment:		When using either the Elemental Method or the Calculation Method for buildings other than dwellings to demonstrate that reasonable provision has been made for the conservation of fuel and power, the U values given in the tinted areas of the <i>Thermal insulation</i> section of these Front Sheets may be used and the area of upstand must be included in the overall area of windows, doors and rooflights. When using the Target U value Method for dwellings, or the Energy Use Method for buildings other than dwellings, the data given in the tinted areas of the <i>Light transmittance and solar heat gain</i> and <i>Thermal insulation</i> sections of these Front Sheets may be used to determine solar gain and heat loss.
Regulation:	K2	Means of ventilation
Comment:		When fitted, ventilators incorporated in the upstands can meet or contribute to meet the requirements of this Regulation. See the tinted areas of the <i>Ventilation</i> section of these Front Sheets.

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: 6 *Delivery and site handling* of these Front Sheets (6.1 and 6.3).

Technical Specification

5 Description

Rooflights

5.1 The thermoformed polycarbonate rooflights are fully described in the accompanying Detail Sheets.

Upstands

5.2 The upstands are fully described in the accompanying Detail Sheets.

5.3 Quality control checks on the units include:

- dimensional accuracy
- visual inspection
- thickness of polycarbonate
- quality of finishes.

6 Delivery and site handling

6.1 The Certificate holder's recommendations for site handling and installation are provided with each delivery.

6.2 The rooflights and upstands are delivered to site ready assembled or in kit form, wrapped in bubble wrap protective sheet, ready for installation. Each rooflight carries a sticker bearing the company's mark and the job identification mark.

6.3 Smaller units may be manhandled to roof level but larger units will require crantage.

6.4 If the rooflights are to be stored on site they should be stacked on edge with an air gap between each rooflight on a dry, flat, level surface under cover away from direct sunlight. Double-skin rooflights must not be nested at any time.

6.5 Before installation the upstands should be laid on timber packers placed on a level surface to avoid damage to finishes and accessories.

Design Data

7 General

7.1 Euroglaze Rooflights and Upstands are suitable for use on the flat roofs of domestic or commercial buildings. Roofs should be designed in accordance with BS 6229 : 2003.


7.2 The plastic rooflights and upstands 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 plastic rooflights and upstands.

7.3 The plastic rooflights are suitable for replacing existing rooflights. The suitability of existing upstands must be checked and be replaced if necessary. The rooflights should not be used without an upstand.

8 Practicability of installation

The plastic rooflights and upstands are practicable to install using the methods and procedures within this Certificate and in accordance with the recommendations given in the Certificate holder's installation guide.

9 Strength and stability


 9.1 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.

9.2 The rooflights and upstands are designed to support an imposed load of 750 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, roof arrangement, type and configuration of rooflights. 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 750 Nm⁻² can be expected.

9.3 Details of the connections between the upstand and the roof must be entrusted to a suitably-qualified person. Guidance is available from the Certificate holder.

9.4 The polycarbonate rooflight material has a good resistance to impact from hard bodies, such as hailstones, or impacts due to vandalism. Tests on typical rooflight samples showed that an impact energy of 20 J did not cause damage when applied at various points of the rooflights.


10 Weathertightness

 10.1 When installed in accordance with the manufacturer's instructions and section 19 of these Front Sheets and sections 5 and 6 in the relevant Detail Sheets, the rooflights and upstands will provide a weatherproof construction.

10.2 Particular attention must be paid to the correct fitting of all components and to the detailing of sealants and roofing materials.

10.3 The installation of vents will affect the air permeability performance. The type of vent specified should take into account the prevailing weather conditions. For example, in locations when driving snow is likely, the selection of a closable vent is recommended.

11 Behaviour in relation to fire

 11.1 The polycarbonate sheets used in the rooflights may be classified as Tp(a) rigid in accordance with the national Building Regulations:

England and Wales

Approved Document B, Appendix A, Section 19

Scotland

Mandatory Standards 2.5 and 2.8, clauses 2.5.4⁽¹⁾⁽²⁾ and 2.8.2⁽¹⁾⁽²⁾ respectively

Northern Ireland

Technical Booklet E, Section 2.5.

11.2 The polycarbonate sheets have a Class 1 surface as is defined in BS 476-7 : 1971 and BS 476-7 : 1987.

11.3 From Table A8 of Approved Document B to The Building Regulations 2000 (as amended) (England and Wales) the typical performance rating of GRP material is class 3.

11.4 Guidance on the limitations of use of these materials is given in the national Building Regulations:

England and Wales

Approved Document B, Tables 11 and 18

Scotland

Mandatory Standards 2.5 and 2.8, clauses 2.5.6⁽¹⁾⁽²⁾ and 2.8.1⁽¹⁾⁽²⁾ respectively

Northern Ireland

Technical Booklet E, Tables 2.2 and 4.8.

11.5 Aluminium and galvanized steel upstand materials can be considered as non-combustible.

11.6 The PVC-U upstands have a Class 1 surface as defined in BS 476-7 : 1997.

(1) Technical Handbook (Domestic).

(2) Technical Handbook (Non-Domestic).


12 Light transmittance and solar heat gain

12.1 For design purposes, the approximate light transmission characteristics at normal incidence are given in Table 1.

Table 1 Light transmission

Polycarbonate finish	Light transmission ⁽¹⁾
Clear	88%
Opal	40%
Bronze	45%
Clear/stippled	83%

(1) In accordance with ASTM D-1003 : 2000.

 12.2 From the basic light transmission figures for normal incidence in Table 1, a solar transmittance factor for different sun angles can be derived for both single- and double-skin rooflights (see Figures 1 and 2).

12.3 When showing compliance to the relevant Requirement or Regulation for Conservation of fuel and power (limiting the heat loss through the fabric of the building) of the national Building Regulations, by using the following method or calculation, data from Figures 1 and 2 should be used with the methods outlined in CIBSE Guide A (1999), Section 2 and Appendix 5 A4, if the total solar gain of the building incorporating the products presents a significant heat input:

- Calculation Method, or Standard or Energy Use Method, or Standards, for buildings other than dwellings, or
- calculating the SAP Energy Rating of a dwelling.

Figure 1 Single-skin solar transmittance factor for different sun angles

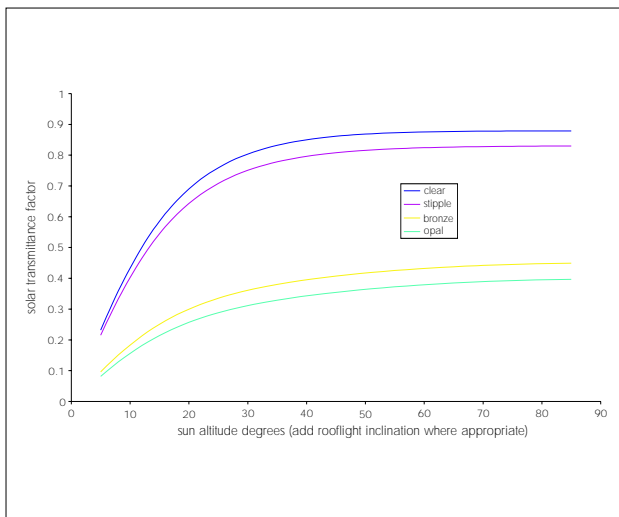


Figure 2 Double-skin solar transmittance factor for different sun angles

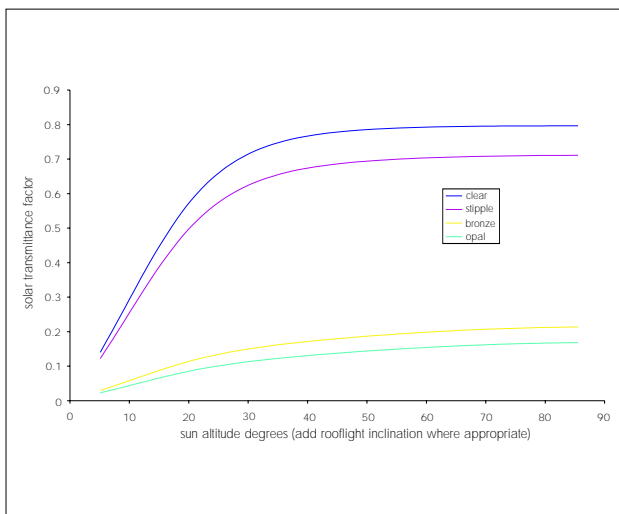
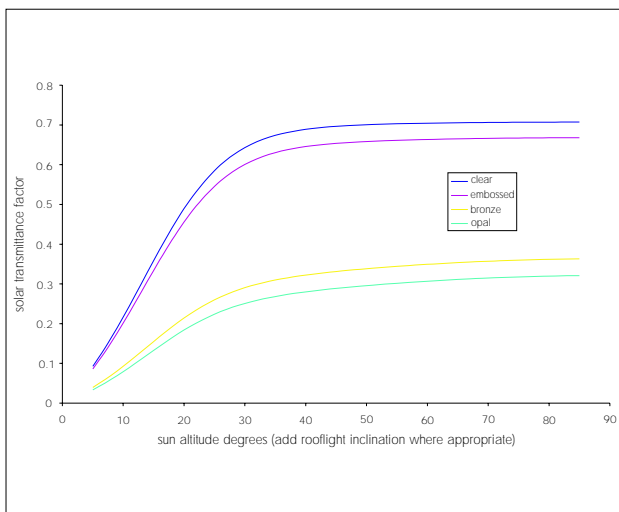


Figure 3 Triple-skin solar transmittance factor for different sun angles



13 Ventilation



The ventilators installed in pairs on opposite sides of the long edges of upstands types L 53, L 64 and L 90, will provide ventilation to the room below the rooflight. The ventilator openings can provide or contribute to providing the background ventilation (trickle ventilator) open area requirements given in the national Building Regulations:

England and Wales

Approved Document F, Tables 1 and 2

Scotland

Mandatory Standard 3.14, clauses 3.14.2⁽¹⁾⁽²⁾, 3.14.3⁽¹⁾⁽²⁾ and 3.14.5⁽¹⁾

Northern Ireland

Technical Booklet K, Tables 2.1 and 2.2.

(1) Technical Handbook (Domestic).

(2) Technical Handbook (Non-Domestic).

14 Thermal insulation



14.1 The thermal transmittance (U values) of the polycarbonate glazing skins of the rooflights calculated according to BS 6993-1 : 1989, when horizontal, are 6.48 Wm⁻²K⁻¹ for the single-skin options, 2.94 Wm⁻²K⁻¹ for the double-skin options and 1.93 Wm⁻²K⁻¹ for the triple-skin options.

14.2 U values, based on nominal rooflight area, of the various double-skin and triple-skin rooflight options (excluding frames) are given in the relevant Tables given in the accompanying Detail Sheets. These values have been calculated using the thermal transmittance of the polycarbonate skins and the geometry of the respective product options.

14.3 The thermal properties of the available upstands and frames may be taken from the relevant Table given in the accompanying Detail Sheets. All the upstand thermal transmittance values exceed the maximum permitted levels for roofs given in the supporting documents in the various Building Regulations.

14.4 When showing compliance to the relevant Requirement or Regulation for Conservation of fuel and power (limiting the heat loss through the fabric of the building) of the national Building Regulations, the U values and areas given in the relevant Tables given in the accompanying Detail Sheets may be used:

Dwellings — Elemental Method

England and Wales

The U values of all the rooflights exceed the standard value for the Elemental Method given in Table 1 of Approved Document L1, therefore, an alternative method should be used.

Scotland

The U values of all the rooflights exceed the maximum U values for exposed building elements when using the Elemental Method given in Table 1 to clause 6.2.1⁽¹⁾, therefore, an alternative method should be used.

(1) Technical Handbook (Domestic).

Northern Ireland

The area of upstand should be included in the overall area of windows, doors and rooflights, and to determine the maximum permitted area and the appropriate U value(s) used in the calculation of the overall average U value for use with Technical Booklet F, Table 1.3.

Dwellings — Heat Loss Method, Carbon Index Method and Target U value Method

England and Wales, Scotland and Northern Ireland

When using the Heat Loss or the Carbon Emission or the Target U value Method, the data given in section 12.2 and the relevant Tables given in the accompanying Detail Sheets may be used to determine solar gain and heat losses.

Buildings other than dwellings — Elemental Method England and Wales

The U values of all the rooflights exceed the standard value for the Elemental Method. The maximum area of rooflights, therefore, must be less than the relevant maximum area given in Table 2 of Approved Document L2 and the relevant area given in the relevant Tables given in the accompanying Detail Sheets should be used. Reasonable provision is given by the insulation of in the upstands.

Scotland

The U values of all the rooflights exceed the maximum U values given in Table 1 to clause 6.2.1⁽²⁾. The maximum area of rooflights, therefore, must be less than the relevant maximum area given in Table 2, to clause 6.2.1⁽²⁾ and the relevant maximum area given in the relevant Tables given in the accompanying Detail Sheets should be used. The area of upstand should be included in the overall area of rooflights, and to determine the maximum permitted area and the appropriate U value(s) used in the calculation of the overall average U value.

(2) Technical Handbook (Non-Domestic).

Northern Ireland

The U values of all the rooflights exceed the maximum U values given in the Table to Technical Booklet F, Table 1.4. The maximum area of rooflights, therefore, must be less than the relevant maximum area given in that Table. The relevant maximum permitted area given in the relevant Tables given in the accompanying Detail Sheets should be used. The area of upstand should be included in the overall area of rooflights, and to

determine the maximum permitted area and the appropriate U value(s) used in the calculation of the overall average U value.

Buildings other than dwellings — Whole-building Method, Carbon Emissions Calculation Method, Carbon Index Method, Calculation Method and Energy Use Method

England and Wales, Scotland and Northern Ireland

When using the Whole-building or the Carbon Emissions Calculation or the Energy Use or the Calculation Method, the data given in section 12.2 and the relevant Tables given in the accompanying Detail Sheets may be used to determine solar gain and heat losses.

Scotland

The U value of a rooflight will be its nominal U value multiplied by its nominal area divided by the actual area of opening. The area of a rooflight would be taken as the area of opening measured internally from reveal to reveal.

15 Condensation risk



15.1 The thermal transmittance values given in section 14.1 imply that the relevant conditions set out in Figures 4, 5 and 6 will have to be exceeded for the onset of surface condensation on the glazing skins of the rooflight. In common with all glazed roof structures, because of temperature reduction under night-time winter-sky radiation conditions, the external environmental temperature used should be taken as 6°C below the design air temperature.

15.2 The conditions set out in Figures 7 to 11, typically, will have to be exceeded for the onset of surface condensation on the various upstand designs.

15.3 Significant surface condensation will only be produced when the conditions given in the relevant graph or graphs are exceeded for long periods. Temporary condensation may be drained to the outside or alleviated by air flow provided from upstand ventilators.

Figure 4 Condensation assessment for Euroglaze single-skin rooflights

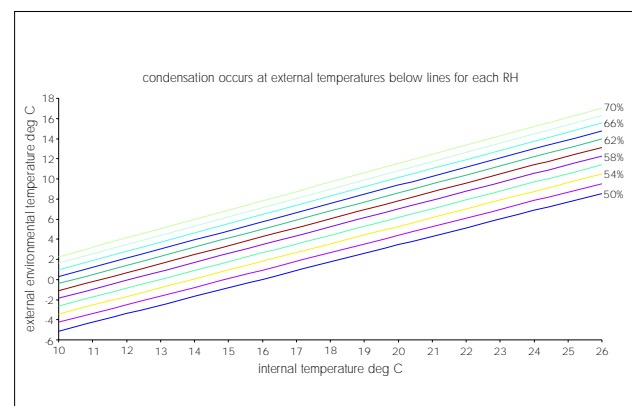


Figure 5 Condensation assessment for Euroglaze double-skin rooflights

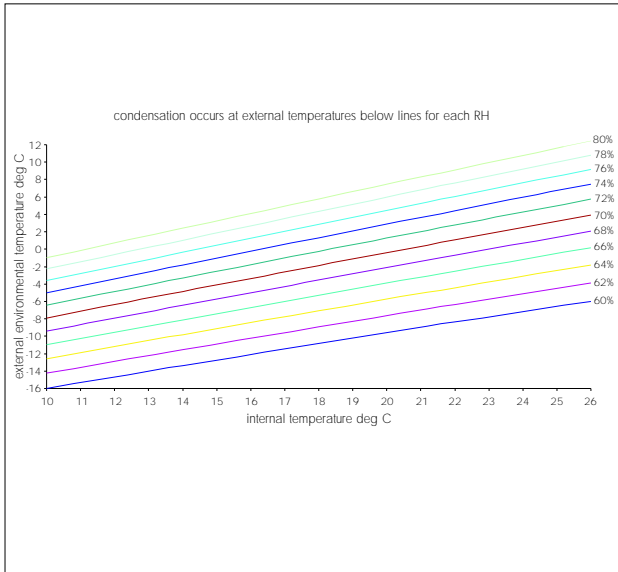


Figure 8 Condensation assessment for Euroglaze metal upstands

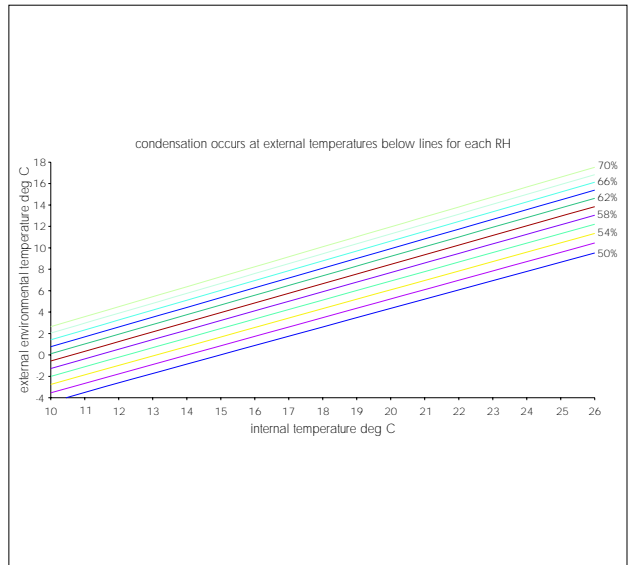


Figure 6 Condensation assessment for Euroglaze triple-skin rooflights

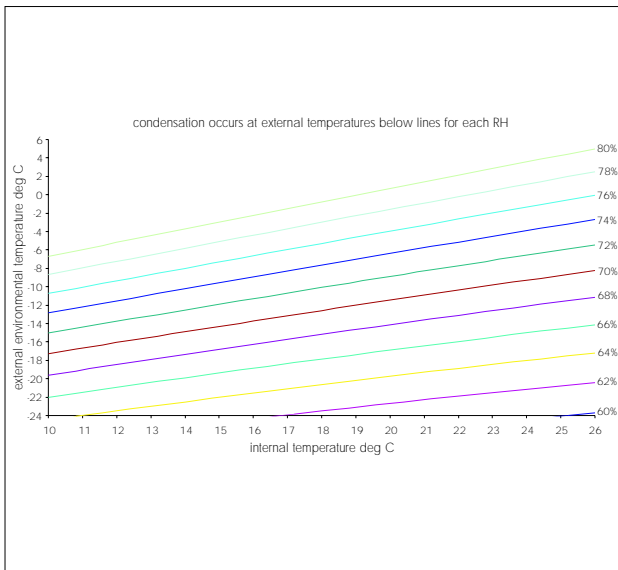


Figure 9 Condensation assessment for Euroglaze metal upstand with 15 mm of perlite board

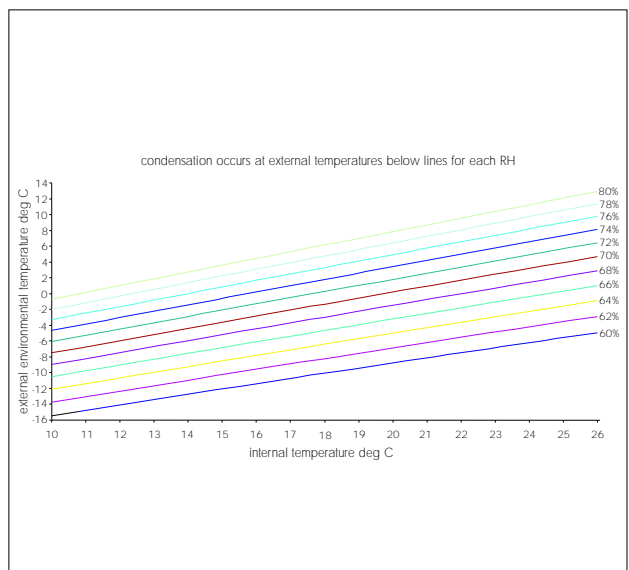


Figure 7 Condensation assessment for Euroglaze XL3000+ upstand

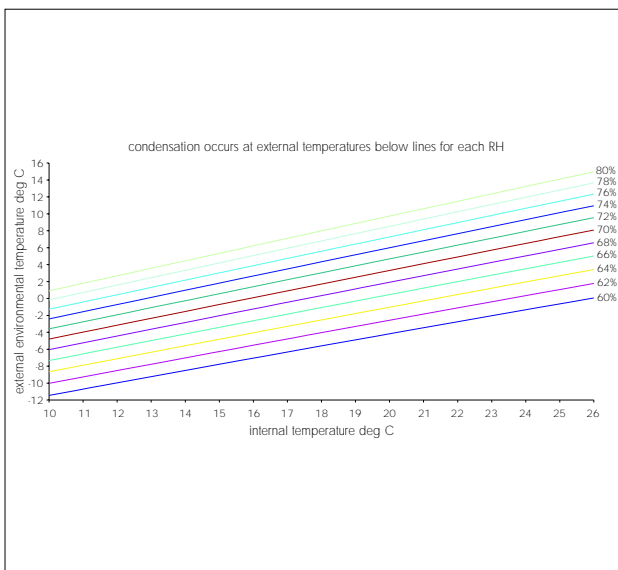


Figure 10 Condensation assessment for Euroglaze glass-fibre upstand with PU foam core

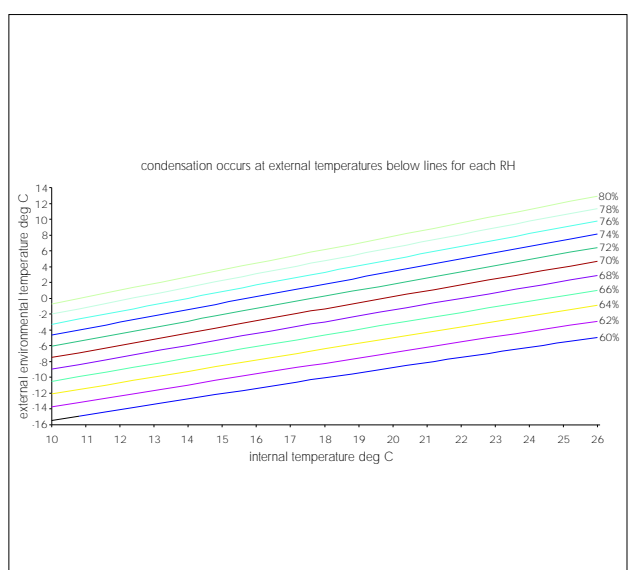
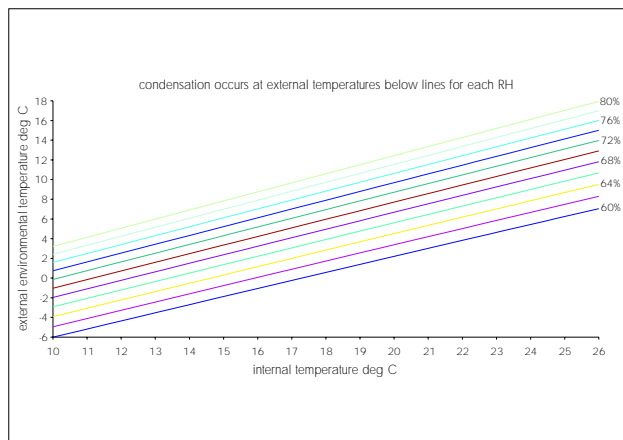


Figure 11 Condensation assessment for Euroglaze adaptor upstand with 6 mm of foamed PVC-U



16 Safety

16.1 If the rooflight is located on a roof which is generally accessible to the public, provision must be made to prevent people falling onto the glazed part (eg guard rails). If, as the result of an accidental fall, contact is made with the polycarbonate rooflight, the polycarbonate material shows good resistance to impact.

16.2 When subjected to normal atmospheric agents, movement of the structure, hygrothermal stresses, or vibrations, the polycarbonate rooflights will not collapse or result in falling debris that would cause injury to occupants or passers-by.

17 Maintenance



17.1 If damage occurs, the rooflights can be re-glazed and the fixings replaced, but these operations should be carried out using the materials approved by the BBA.

17.2 Cleaning of the rooflights should be carried out using water containing household detergent. To avoid scratching of the surface, only soft cloths should be used when cleaning.

17.3 Under no circumstances should anyone venture onto a polycarbonate rooflight. For maintenance purposes special precautions must be taken to prevent the possibility of falling through the polycarbonate rooflight, even though the rooflight may support such a load.

18 Durability



Available test data and knowledge of the material suggest that the product, when installed in accordance with this Certificate, should have a life of at least 25 years for the high performance and 10 years for the standard polycarbonate material when used as the external skin. Minor changes in surface appearance and a reduction in light transmission may occur during this period.

Installation

19 General

19.1 Installation of the Euroglaze Rooflights and Upstands should be carried out in accordance with the Certificate holder's installation instructions (see sections 5 and 6 of the relevant Detail Sheets).

19.2 Where an adaptor upstand is specified, supporting structures must have a suitable sealant applied to them before the base flange is positioned. The standard upstands do not require sealing as they are protected by the roof covering.

Bibliography

BS 476-7 : 1971 *Fire tests on building materials and structures — Surface spread of flame tests for materials*

BS 476-7 : 1987 *Fire tests on building materials and structures — Method of test to determine the classification of the surface spread of flame of products*

BS 476-7 : 1997 *Fire tests on building materials and structures — Method of test to determine the classification of the surface spread of flame of products*

BS 6229 : 2003 *Flat roofs with continuously supported coverings — Code of practice*

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 6993-1 : 1989 *Thermal and radiometric properties of glazing — Method for calculation of the steady state U-value (thermal transmittance)*

ASTM D 1003 : 2000 *Test Method for Haze and Luminous Transmittance of Transparent Plastics*

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

Conditions of Certification

20 Conditions

20.1 This Certificate:

- (a) relates only to the product that is named, 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.

20.2 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.

20.3 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) continue to be checked as and when deemed appropriate by the BBA under arrangements that it will determine; and

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

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

- (a) the presence or absence of any patent, intellectual property 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 actual works in which the product is installed, used and maintained, including the nature, design, methods and workmanship of such works.

20.5 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.



In the opinion of the British Board of Agrément, Euroglaze Rooflights and Upstands are fit for their intended use provided they are installed, used and maintained as set out in this Certificate. Certificate No 05/4279 is accordingly awarded to Bauder Ltd.

On behalf of the British Board of Agrément

Date of issue: 20th October 2005

Chief Executive

Electronic Copy

British Board of Agrément

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

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



For technical or additional information,
contact the Certificate holder (see
front page).
For information about the Agrément
Certificate, including validity and
scope, tel: Hotline 01923 665400,
or check the BBA website.



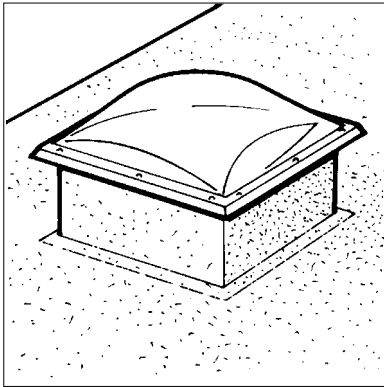
Bauder Ltd

Certificate No 05/4279

**THE EUROGLAZE FIXED INDIVIDUAL
ROOFLIGHTS AND UPSTANDS**

DETAIL SHEET 2

Product



• THIS DETAIL SHEET RELATES TO THE EUROGLAZE FIXED INDIVIDUAL ROOFLIGHTS AND UPSTANDS.

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

Technical Specification

1 Description

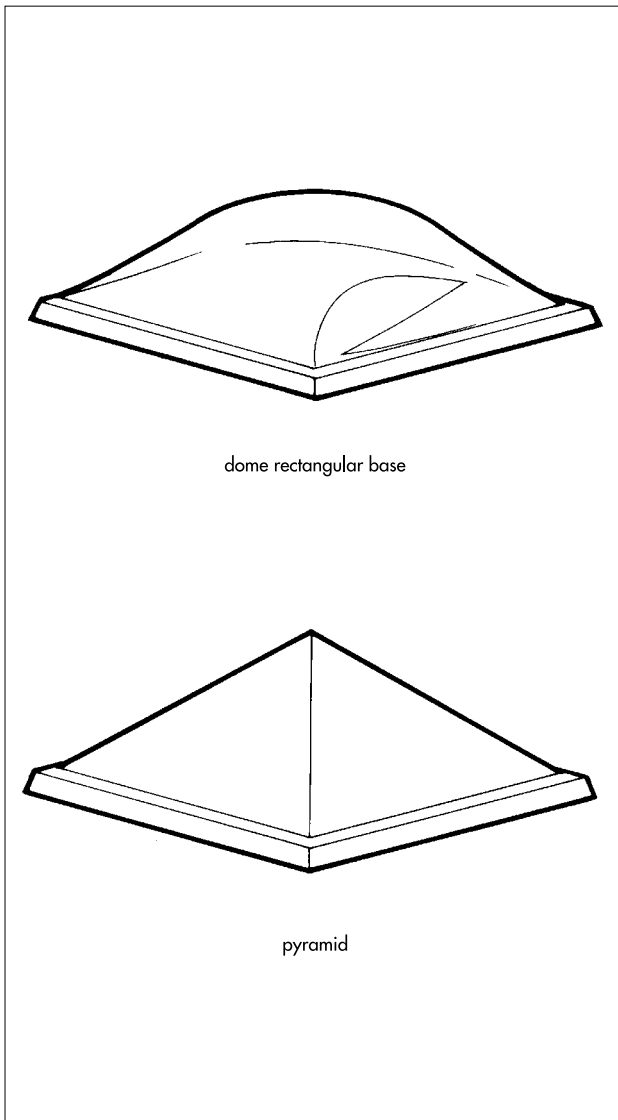
1.1 The Euroglaze Fixed Individual polycarbonate Rooflights are designed and thermoformed from 3 mm minimum thick polycarbonate sheets, both sides coated with UV protection film, for use in the exposure conditions described in this Certificate.

1.2 The polycarbonate rooflights are available as single- or double- or triple-skin, in clear (smooth and stipple finish), bronze and opal colours and are fixed through factory-drilled holes onto Euroglaze upstands or conventional builder's timber or concrete upstands. Rooflights fixed on Euroglaze PVC-U upstands are available as double- or triple-skin only. Double-skin rooflights incorporate a double-sided adhesive PVC strip. Triple-skin rooflights also feature a polycarbonate spacer between skins. They are available in the styles and sizes listed in Table 1 and shown in Figure 1.

Table 1 Sizes and styles of rooflights

	Dome rectangular base XL 102 (mm)	Pyramid XL 100 (mm)
Square	600 x 600	600 x 600
	900 x 900	900 x 900
	1000 x 1000	1000 x 1000
	1200 x 1200	1200 x 1200
	1500 x 1500	1500 x 1500
	1800 x 1800	1800 x 1800
Rectangular	600 x 900	600 x 900
	600 x 1200	600 x 1200
	600 x 1500	600 x 1500
	600 x 1800	600 x 1800
	600 x 2400	900 x 2400
	900 x 1200	900 x 1200
	900 x 1500	900 x 1500
	900 x 1800	900 x 1800
	900 x 2400	900 x 2400
	1000 x 1500	1000 x 1500
	1000 x 2000	1000 x 2000
	1200 x 1500	1200 x 1500
1200 x 1800	1200 x 1800	
1200 x 2400	1200 x 2400	

Figure 1 Euroglaze individual rooflights



1.3 Other sizes within this size range can also be fabricated on request and are covered by this Certificate.

1.4 Euroglaze upstands are available in four materials: PVC-U, glass-fibre (GRP), galvanized steel and aluminium. The PVC-U upstands are available in white. The galvanized steel and aluminium upstands and adaptor upstands have a white base coat paint finish on exposed faces as standard and a gloss paint or powder-coated finish is available as an option. The GRP upstands are white, smooth internally and textured externally. Holes for fixing Euroglaze upstands onto the roof structure are drilled on site. The types of upstands are listed in Table 2 and shown in Figure 2.

Table 2 Euroglaze upstands

Type	Upstands for individual rooflights
Unvented	XL 89
Permanent ventilation	XL 53
Hit-and-miss	XL 64
Controlled louvre	XL 90
Adaptor upstand	XL AK ⁽¹⁾

(1) Available in galvanized steel and aluminium.

1.5 GRP upstands are insulated as standard. Perlite board insulation (15 mm thick) is available for aluminium and galvanized steel upstands. Adaptor upstands are insulated with foam PVC sheet (6 mm thick).

1.6 Upstands may be unvented or may incorporate permanent vents, hit-and-miss vents or controlled louvres (see Table 2 and Figure 2). The height of GRP, galvanized steel and aluminium unvented upstands is 175 mm and that of the vented types 175 mm to the underside of the vent. Additional height can be provided to metal upstands to compensate for fitting below deck, or exceptional depth of insulation and screed. The height of the PVC-U upstands is 237 mm. Where controlled louvres are fitted onto PVC-U upstands an adaptor upstand has to be fitted first.

1.7 The full specifications and drawings for the materials and components covered by this Detail Sheet are retained by the BBA.

1.8 Rooflights can be supplied separately, for assembling on site, pre-assembled onto Euroglaze upstands, or pre-assembled with Protectolite, a security shielding system (see Figure 4 and section 4). In addition, the aluminium Protectolite frame serves as a condensation drain tray to the outside.

1.9 To prevent ingress of moisture, the polycarbonate rooflights are fixed onto the upstand using the screws, Seala washers and caps supplied by the manufacturer (see Figure 3).

Figure 2 Euroglaze upstands

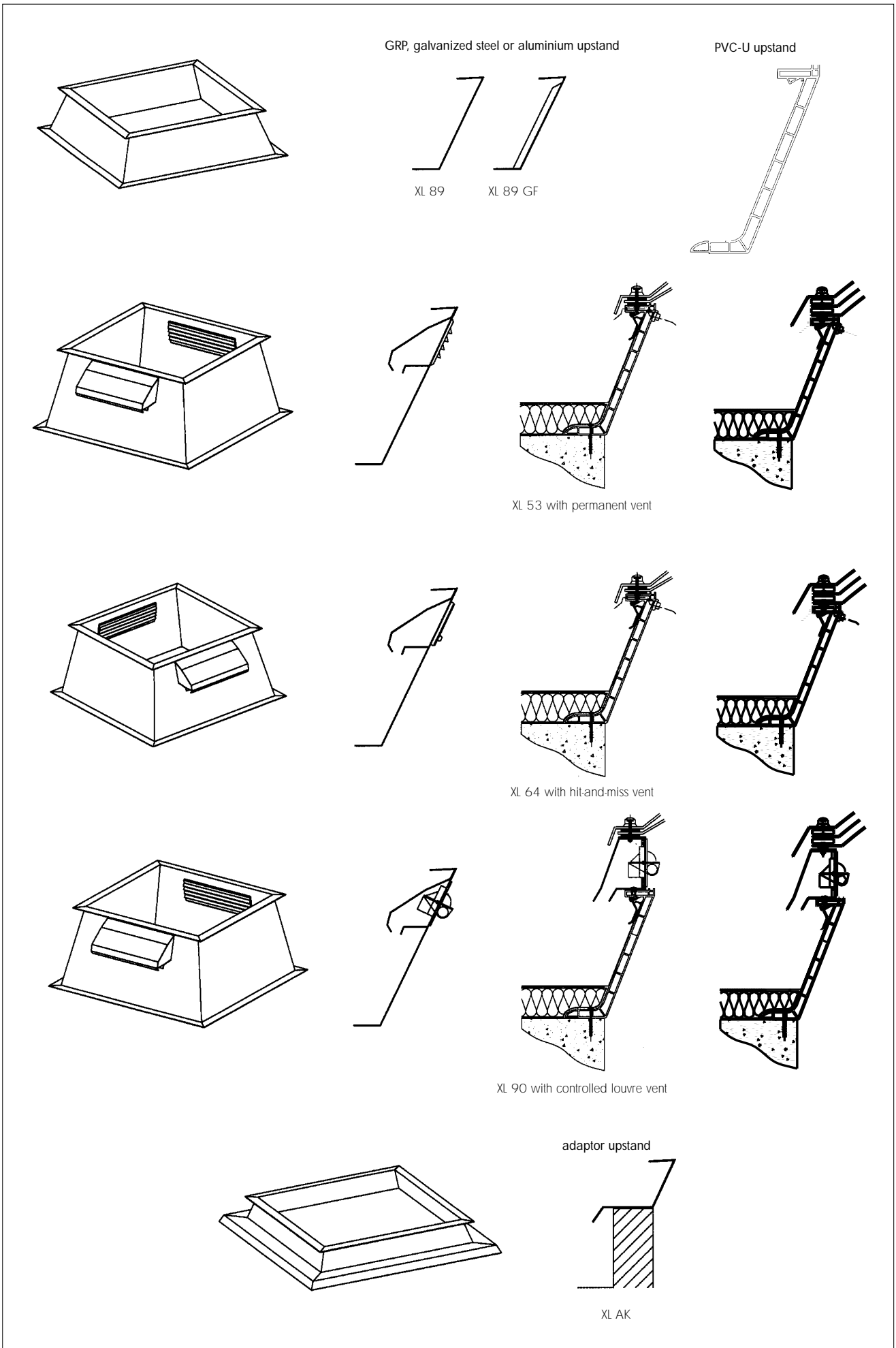
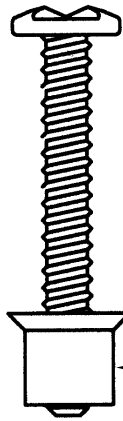
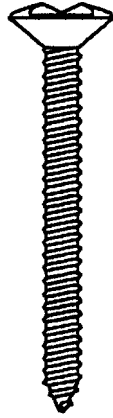


Figure 3 Fixings

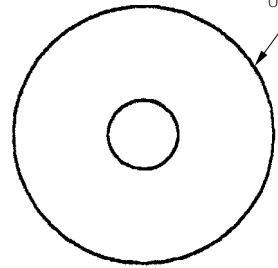


nut or nut sert

tamper-proof fixing
(clutch-head screw)

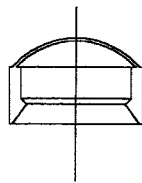


tamper-proof fixing
(countersunk screw)

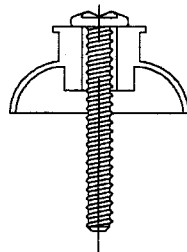


opaque acrylic

Vacca washer

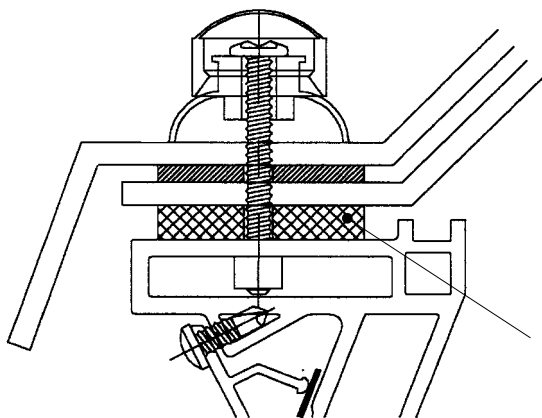


Seala cap



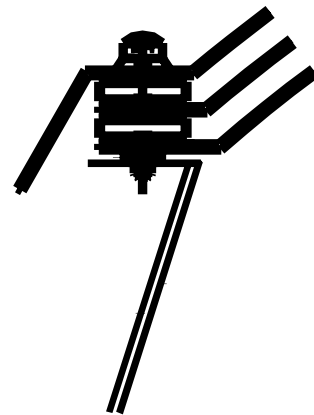
Seala washer

assembly indication



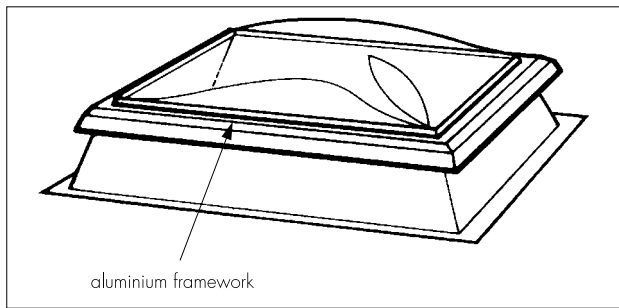
PVC tape or
Vacca washer

double-skin assembly detail



triple-skin assembly detail

Figure 4 Protectolite frame



1.10 Roof coverings are applied up to the external face of the upstand flange.

Design Data

2 Strength and stability



Tests have shown that resistance to imposed snow loads and wind loads by the rooflights is dependent on size and configuration. As a

guide, small pyramid-shaped rooflights are most resistant to imposed loads, whilst large, domed rooflights are the least resistant. Rooflights, therefore, should be selected according to the loads expected for a particular location. The results for selected rooflights are given in Table 3.

Table 3 Resistance to snow and wind loads

Rooflight type		Snow load (Nm ⁻²)	Wind load (Nm ⁻²)
Domed	600 mm x 600 mm	3500 ⁽¹⁾	3000
Pyramid	1200 mm x 2400 mm	2700 ⁽²⁾	2000
Domed	1200 mm x 2400 mm	1700 ⁽²⁾	1200

(1) Rooflight remained undamaged at load shown. Snow load was simulated by use of air pressure.

(2) Buckling occurred at this load, but pressure applied internally restored the shape of the rooflight. Snow load was simulated by use of sand.

3 Thermal properties

The values given in Tables 4 to 6 can be used to determine U values, and heat losses as described in section 14 of the Front sheets.

Table 4 Thermal properties of upstands

Upstand type	U value ⁽¹⁾ (Wm ⁻² K ⁻¹)	Height (mm)	Internal area per metre run (m ²)	Linear thermal transmittance (Wm ⁻¹ K ⁻¹)
PVC-U	2.57	250	0.267	0.69
Steel or aluminium	5.22	175	0.195	1.02
		288	0.300	1.56
Metal with 15 mm of perlite board ⁽²⁾	2.15	175	0.195	0.42
		288	0.300	0.65
Glass fibre with PU foam core	2.18	175	0.195	0.43
Adaptor upstand and with 6 mm of foam PVC sheet	3.43	100		

(1) Including 5 mm of bitumen felt.

(2) Thermal conductivity 0.055 Wm⁻¹K⁻¹.

Table 5 Thermal transmittance (U values) of double- and triple-skin dome rooflights

Width (m)	Length (m)	Rise (m)	Nominal area of rooflight (m ²)	Overall area of glazing (m ²)	Nominal U value ⁽¹⁾ (Wm ⁻² K ⁻¹)		Maximum permitted area of rooflights as % of roof area for buildings other than dwellings			
					Double	Triple	England and Wales and Scotland ⁽²⁾		Northern Ireland ⁽²⁾	
							Double	Triple	Double	Triple
0.6	0.6	0.12	0.360	0.434	3.44	2.27	12.8	19.3	19.2	29.0
0.75	0.75	0.15	0.563	0.677	3.44	2.27	12.8	19.3	19.2	29.0
0.9	0.9	0.18	0.810	0.976	3.44	2.27	12.8	19.3	19.2	29.0
1.0	1.0	0.20	1.000	1.204	3.44	2.27	12.8	19.3	19.2	29.0
1.05	1.05	0.21	1.103	1.328	3.44	2.27	12.8	19.3	19.2	29.0
1.2	1.2	0.24	1.440	1.734	3.44	2.27	12.8	19.3	19.2	29.0
1.35	1.35	0.27	1.823	2.195	3.44	2.27	12.8	19.3	19.2	29.0
1.5	1.5	0.30	2.250	2.710	3.44	2.27	12.8	19.3	19.2	29.0
1.8	1.8	0.36	3.240	3.902	3.44	2.27	12.8	19.3	19.2	29.0
0.6	0.9	0.12	0.540	0.624	3.32	2.19	13.2	20.1	19.9	30.1
0.6	1.2	0.12	0.720	0.818	3.27	2.16	13.5	20.4	20.2	30.6
0.6	1.5	0.12	0.900	1.013	3.25	2.14	13.6	20.6	20.3	30.9
0.6	1.8	0.12	1.080	1.209	3.23	2.13	13.6	20.7	20.4	31.0
0.6	2.4	0.12	1.440	1.602	3.21	2.12	13.7	20.8	20.5	31.2
0.9	1.2	0.18	1.080	1.260	3.35	2.21	13.1	19.9	19.7	29.9
0.9	1.35	0.18	1.215	1.404	3.32	2.19	13.2	20.1	19.9	30.1
0.9	1.5	0.18	1.350	1.549	3.30	2.18	13.3	20.2	20.0	30.3
0.9	1.8	0.18	1.620	1.840	3.27	2.16	13.5	20.4	20.2	30.6
0.9	2.4	0.18	2.160	2.425	3.24	2.13	13.6	20.6	20.4	30.9
1.0	1.5	0.20	1.500	1.733	3.32	2.19	13.2	20.1	19.9	30.1
1.0	2.0	0.20	2.000	2.271	3.27	2.16	13.5	20.4	20.2	30.6
1.2	1.5	0.24	1.800	2.113	3.37	2.22	13.1	19.8	19.6	29.7
1.2	1.8	0.24	2.160	2.496	3.32	2.19	13.2	20.1	19.9	30.1
1.2	2.4	0.24	2.880	3.270	3.27	2.16	13.5	20.4	20.2	30.6

(1) Calculated values based on an average 12 mm wide cavity between skins.

(2) In Scotland and Northern Ireland the area of any upstand should be included in the area of rooflight and the overall maximum permitted area weighted in proportion to its U value.

Table 6 Thermal transmittance (*U* values) of double- and triple-skin pyramid rooflights

Width (m)	Length (m)	Rise (m)	Nominal area of rooflight (m ²)	Overall area of glazing (m ²)	Nominal U value ⁽¹⁾ (Wm ⁻² K ⁻¹)		Maximum permitted area of rooflights as % of roof area for buildings other than dwellings			
					Double	Triple	England and Wales and Scotland ⁽²⁾		Northern Ireland ⁽²⁾	
							Double	Triple	Double	Triple
0.6	0.6	0.214	0.360	0.442	3.48	2.31	12.6	19.1	19.0	28.6
0.75	0.75	0.268	0.563	0.691	3.48	2.31	12.6	19.1	19.0	28.6
0.9	0.9	0.321	0.810	0.995	3.48	2.31	12.6	19.1	19.0	28.6
1.0	1.0	0.357	1.000	1.229	3.48	2.31	19.0	19.1	19.0	28.6
1.05	1.05	0.375	1.103	1.355	3.48	2.31	12.6	19.1	19.0	28.6
1.2	1.2	0.429	1.440	1.770	3.48	2.31	12.6	19.1	19.0	28.6
1.35	1.35	0.482	1.823	2.240	3.48	2.31	12.6	19.1	19.0	28.6
1.5	1.5	0.536	2.250	2.765	3.48	2.31	12.6	19.1	19.0	28.6
1.8	1.8	0.643	3.240	3.982	3.48	2.31	12.6	19.1	19.0	28.6
0.6	0.9	0.214	0.540	0.631	3.33	2.20	13.2	20.0	19.8	29.9
0.6	1.2	0.214	0.720	0.825	3.28	2.17	13.4	20.3	20.1	30.5
0.6	1.5	0.214	0.900	1.021	3.26	2.15	13.5	20.5	20.3	30.7
0.6	1.8	0.214	1.080	1.219	3.24	2.14	13.6	20.6	20.4	30.9
0.6	2.4	0.214	1.440	1.616	3.23	2.13	13.6	20.7	20.4	31.0
0.9	1.2	0.321	1.080	1.276	3.37	2.23	13.1	19.8	19.6	29.6
0.9	1.35	0.321	1.215	1.419	3.33	2.20	13.2	20.0	19.8	29.9
0.9	1.5	0.321	1.350	1.564	3.31	2.19	13.3	20.1	19.9	30.2
0.9	1.8	0.321	1.620	1.856	3.28	2.17	13.4	20.3	20.1	30.5
0.9	2.4	0.321	2.160	2.445	3.25	2.14	13.5	20.5	20.3	30.8
1.0	1.5	0.357	1.500	1.752	3.34	2.20	13.2	20.0	19.8	29.9
1.0	2.0	0.357	2.000	2.291	3.28	2.17	13.4	20.3	20.1	30.5
1.2	1.5	0.429	1.800	2.143	3.39	2.24	13.0	19.6	19.5	29.4
1.2	1.8	0.429	2.160	2.523	3.34	2.21	13.2	20.0	19.8	29.9
1.2	2.4	0.429	2.880	3.299	3.28	2.17	13.4	20.3	20.1	30.5

(1) Calculated values based on an average 12 mm wide cavity between skins.

(2) In Scotland and Northern Ireland the area of any upstand should be included in the area of rooflight and the overall maximum permitted area weighted in proportion to its U value.

4 Security against intrusion

4.1 Euroglaze Fixed Individual Rooflights are supplied with tamper-proof fixings (clutch-head screws), unless otherwise specified, to make removal of the rooflight from the upstand more difficult (see Figure 3).

4.2 Polycarbonate rooflights have a good resistance to impact, making breakage very difficult.

4.3 Individual rooflights can be specified with a Protectolite frame (a welded-aluminium framework) around the edge of the rooflight, thus providing a continuous, concealed fixing between rooflight and upstand.

5.4 A rooflight should never be left in position without ensuring all its fixings are present and fully tightened.

5.5 Where the roof covering is dressed below the rooflight and on top of a timber or concrete upstand, precautions should be taken to prevent bitumen damaging internal finishes.

5.6 Fixings for fixing Euroglaze upstands or adaptor upstands onto the roof structure are not supplied by the Certificate holder.

Installation

5 General

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

5.2 Prior to installation of the rooflight, the roof must be checked by means of calculations or testing to ensure that it can carry the additional loads the installation may impose, strengthening the roof if necessary. This work must be carried out by a suitably-qualified person.

5.3 The rooflight upstand should be checked dimensionally to ensure the fit, and the rooflight should be checked for size before the unit is lifted to the roof.

6 Procedure

Fixing Euroglaze rooflights to timber upstands (see Figure 5)

6.1 Single-skin rooflights are fixed to builder's timber upstands using 50 mm by No 10 tamper-proof fixings with flat Vacca washers underneath the rooflight. The PVC Seala washer is positioned on the rooflight and the fixing is fitted through the hole and tightened, prior to the PVC Seala cap being fitted.

6.2 Double- and triple-skin rooflights are provided with a loose roll of single-sided adhesive PVC tape which is to be fitted between the rooflight and the upstand. The protective paper is peeled off and the adhesive face is placed on the upstand, taking care not to stretch the tape. The tape should be mitred at corners. The PVC Seala washer is positioned on the rooflight and the tamper-proof screw (50 mm by No 10) is fitted through the hole and tightened, prior to the PVC Seala cap being fitted.

Fixing Euroglaze rooflights to concrete upstands (see Figure 5)

6.3 The method is the same as for timber upstands except that a timber fillet may be fitted first and the fixing must penetrate through both timber, if used, and concrete. The tamper-proof fixings can be fixed directly into concrete, however, the installer must use suitable Rawlplugs or similar first.

Fixing Euroglaze rooflights to Euroglaze PVC-U, GRP, galvanized steel or aluminium upstands (see Figure 5)

6.4 The plastic rooflight is placed on the upstand and the positions of the holes on the rooflight are marked onto the upstand. Holes (8 mm diameter) are drilled through at those points, ensuring that the swarf is removed from the upstand after drilling.

6.5 For single-skin plastic rooflights the Vacca washer is placed on the upstand first, followed by the plastic rooflight and the PVC Seala washer. The bolt is fitted through the hole, a Nyloc nut is attached and after the bolt is tightened the PVC Seala cap is fitted, ensuring that the nut is tightened fully against the underside of the flange.

6.6 Double- and triple-skin rooflights are provided with a loose roll of single-sided adhesive PVC tape which is to be fitted between the rooflight and the upstand. The protective paper is peeled off and the adhesive face is placed on the upstand, taking care not to stretch the tape. The tape should be mitred at corners. The PVC Seala washer is positioned on the rooflight and the bolt is fitted through the hole, the Nyloc nut attached and the bolt tightened; then the PVC Seala cap is fitted. Vacca washers can be specified on request as an alternative to PVC tape, where background ventilation is required.

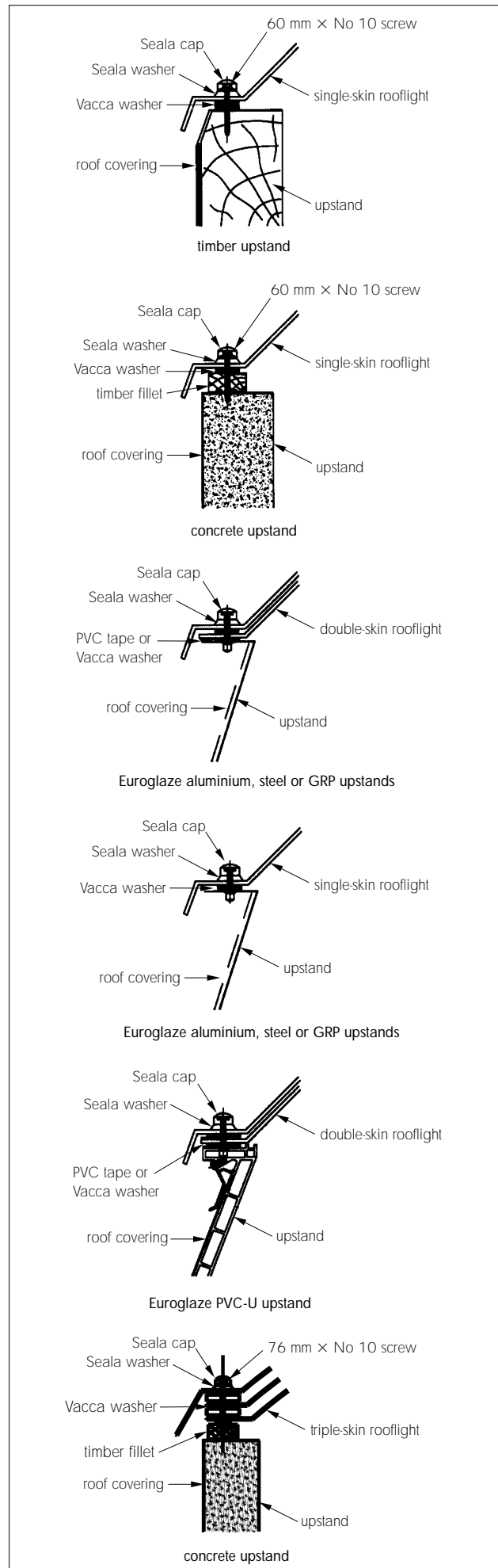
Fixing Euroglaze GRP, galvanized steel or aluminium upstands to timber or metal roofs

6.7 The base flange of the upstand is placed on the roof deck and fixed with nickel-plated wood-screws (60 mm by No 10), roof bolts or proprietary fasteners with equivalent pull-out resistance. Holes are drilled 100 mm maximum from corners and at approximately 300 mm centres. When fitting GRP upstands flat, metal washers must be used on top of the base fixing flange to prevent damage.

Fixing Euroglaze PVC-U upstands to timber or metal roofs

6.8 The base flange of the upstand is placed on the roof deck and fixed with nickel-plated wood-screws (60 mm by No 10), roof bolts or proprietary fasteners with equivalent pull-out resistance onto timber roofs and self-drilling/tapping screws or similar onto metal roofs. Holes are drilled at the 'V' groove along the base flange, 100 mm maximum from corners and at 300 mm centres maximum.

Figure 5 Typical installation detail



Fixing Euroglaze GRP, galvanized steel or aluminium upstands to concrete

6.9 Rawlplugs (60 mm) or equivalent must be inserted into concrete and the upstand secured with wood-screws (50 mm by No 10) 100 mm maximum from corners and at 300 mm centres maximum.

Fixing Euroglaze PVC-U upstands to concrete

6.10 Rawlplugs (60 mm) or equivalent must be inserted into concrete at the 'V' groove along the base flange, and the upstand secured with wood-screws (50 mm by No 10, minimum 40 mm clearance) 100 mm maximum from corners and at 300 mm centres maximum.

6.11 Before applying the roof covering it must be ensured that the upstands are prepared in accordance with the roof covering manufacturer's recommendations. The roof covering should then be dressed to the external face of the top flange of the upstands.

Technical Investigations

The following is a summary of the technical investigations carried out on The Euroglaze Fixed Individual Rooflights and Upstands.

7 Tests

Tests were carried out in accordance with MOAT No 1 : 1974 and MOAT No 54 : 1989 to determine:

- watertightness
- effect of wind loads
- effect of snow loads
- effect of impacts
- effect of solar heating and thermal shock
- resistance to intrusion
- suitability of materials.

8 Investigations

8.1 The manufacturing process was examined, including the methods adopted for quality control, and details were obtained relating to the quality and composition of the materials.

8.2 A site visit was conducted to establish the product's performance and durability in service.

8.3 Computer calculations for assessing the risk of condensation and calculating the thermal transmittance of the rooflights were carried out.

8.4 Existing data were examined in relation to performance in fire.

Bibliography

MOAT No 1 : 1974 *Directive for the Assessment of Windows*

MOAT No 54 : 1989 *UEAtc Guide for the Agrément of individual rooflights*



On behalf of the British Board of Agrément

Date of issue: 20th October 2005

A handwritten signature in black ink, appearing to read 'G. A. Cooper'.

Chief Executive



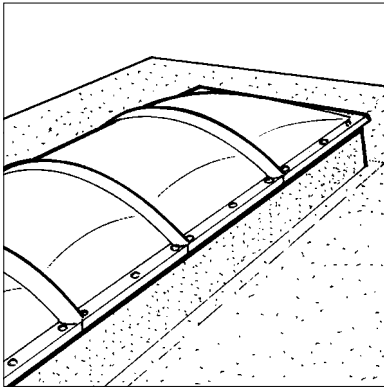
Bauder Ltd

Certificate No 05/4279

THE EUROGLAZE FIXED CONTINUOUS BARREL VAULT ROOFLIGHTS AND UPSTANDS

DETAIL SHEET 3

Product



• THIS DETAIL SHEET RELATES TO THE EUROGLAZE FIXED CONTINUOUS BARREL VAULT ROOFLIGHTS AND UPSTANDS.

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

Technical Specification

1 Description

1.1 The polycarbonate rooflights are designed and thermoformed from 3 mm minimum thick polycarbonate sheets, both sides coated with UV protection film, for use in the exposure conditions described in this Certificate. They are available in interlocking sections of one metre maximum nominal width to form continuous runs with thermoformed jointing pieces. Domed ends vary to allow for non-modular lengths.

1.2 The polycarbonate rooflights are available as single-, double- or triple-skin, in clear (smooth and stipple finish), bronze and opal colours and are fixed through factory-drilled holes onto Euroglaze upstands. Double-skin rooflights incorporate a double-sided adhesive PVC strip. Triple-skin rooflights also feature a polycarbonate spacer between skins. They are available in section in the sizes listed in Table 1 and shown in Figure 1.

1.3 Other sizes within this size range can also be fabricated on request and are covered by this Certificate.

1.4 The upstands are available in three materials: glass-fibre (GRP), galvanized steel and aluminium. The galvanized steel and aluminium upstands have a white base coat paint finish on exposed faces as standard and a gloss paint or powder-coated finish is available as an option. The GRP upstands are white, smooth internally and textured externally. Holes for fixing Euroglaze upstands onto the roof structure are drilled on site. The types of upstands are listed in Table 2 and shown in Figure 2.

Table 1 Sizes of barrel vault rooflights

XL 101	
width (mm)	length (mm)
600	} as required
750	
900	
1050	
1200	
1350	
1500	
1650	
1750	
1800	
2000	
2100	
2250	
2400	

Figure 1 Euroglaze barrel vault rooflights

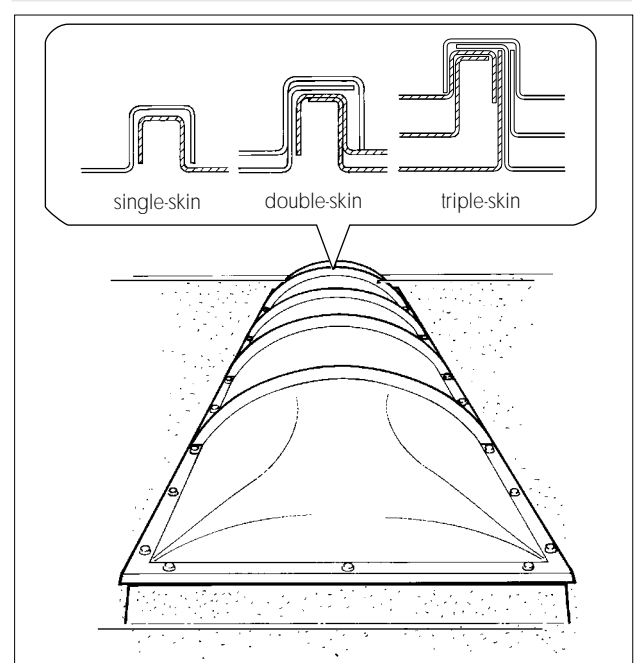


Table 2 Euroglaze upstands

Type	Upstands for barrel vault rooflights
Unvented	XL 101 89
Permanent ventilation	XL 101 53
Hit-and-miss	XL 101 64
Controlled louvre	XL 101 90
Adaptor upstand	XL 101 AK ⁽¹⁾

(1) Available in galvanized steel and aluminium.

1.5 GRP upstands are insulated as standard. Perlite board insulation (15 mm thick) is available for aluminium and galvanized steel upstands. Adaptor upstands are insulated with foam PVC sheet (6 mm thick).

1.6 Upstands may be unvented or may incorporate permanent vents, hit-and-miss vents

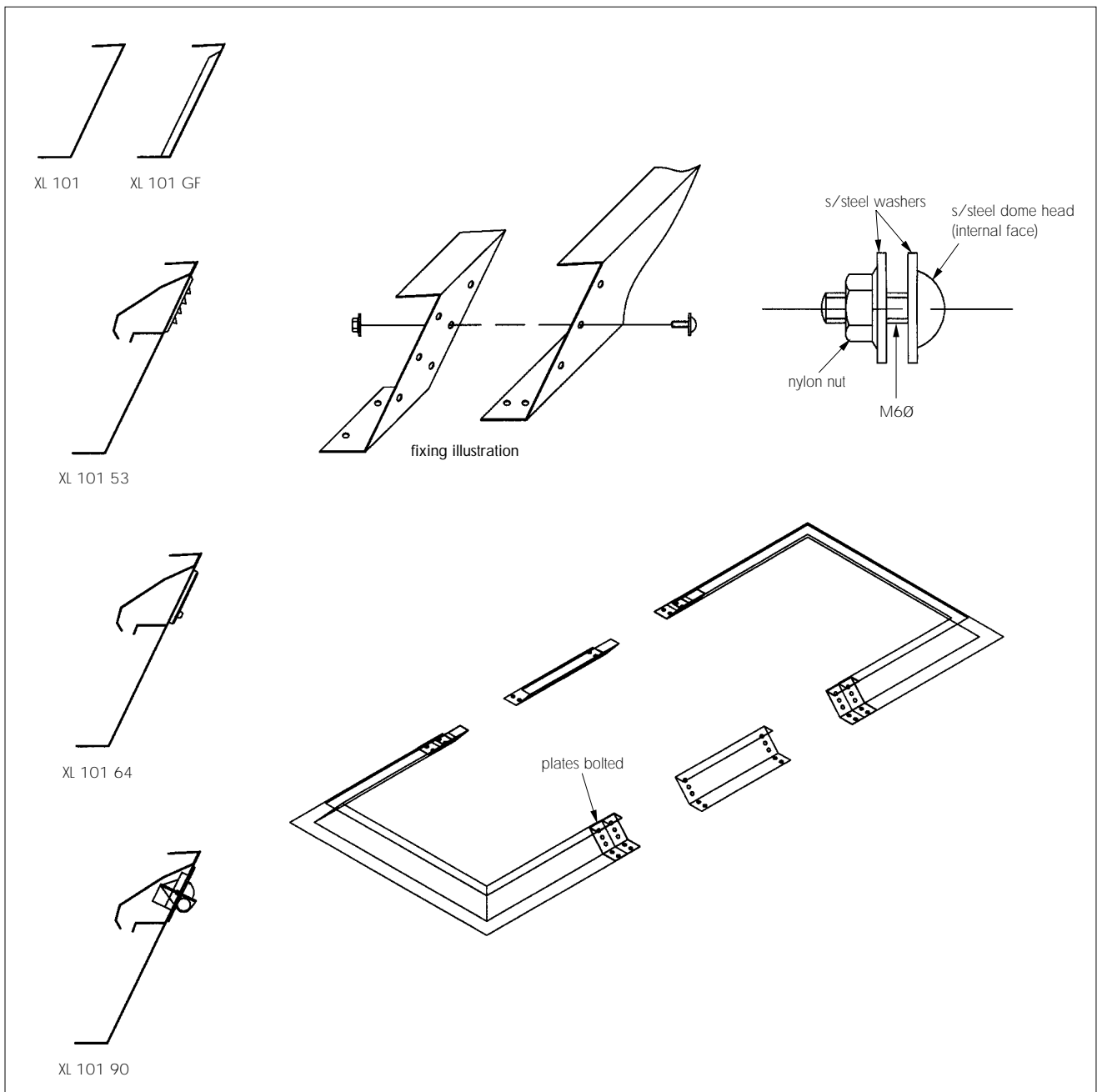
or controlled louvres (see Table 2 and Figure 2). The height of GRP, galvanized steel and aluminium unvented upstands is 175 mm and that of the vented types 175 mm to the underside of the vent. Additional height can be provided to metal upstands to compensate for fitting below deck, or exceptional depth of insulation and screed.

1.7 The full specifications and drawings for the materials and components covered by this Detail Sheet are retained by the BBA.

1.8 To prevent the ingress of moisture, the polycarbonate rooflights are fixed onto the upstand using the screws, Seala washers and caps supplied by the manufacturer (see Figure 3).

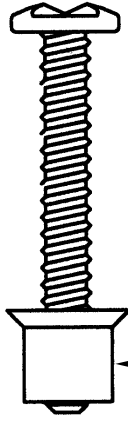
1.9 Roof coverings are applied up to the external face of the upstand flange.

Figure 2 Euroglaze upstands



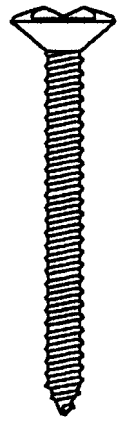
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Figure 3 Fixings

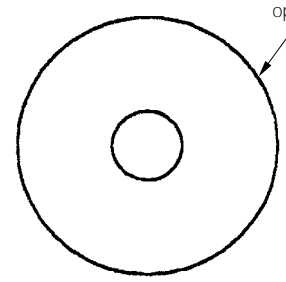


nut or nut sert

tamper-proof fixing
(clutch-head screw)

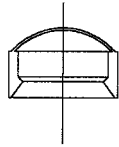


tamper-proof fixing
(countersunk screw)

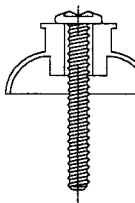


opaque acrylic

Vacca washer

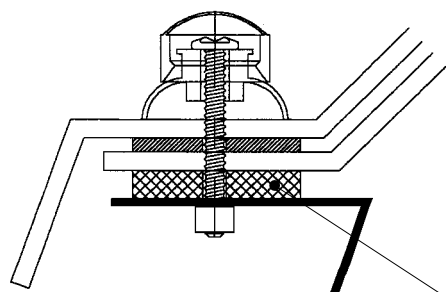


Seala cap



Seala washer

assembly indication



PVC tape or
Vacca washer

assembly detail

Design Data

2 Strength and stability



2.1 Tests were carried out on a barrel vault rooflight 2400 mm wide by 5000 mm long, comprising five sections. Snow loading was simulated by use of sand applied over half the rooflight surface. The results are given in Table 3.

Table 3 Resistance to snow loads

Rooflight type	Snow load (Nm ⁻²)
XL 101 2400 mm x 5000 mm	2200 ⁽¹⁾

(1) Panels disengaged at rib joint but held load. Panels returned to normal after removing the load.

2.2 Fixing the barrel vault rooflight to the upstand is described in section 6 of this Detail Sheet. Adequate resistance to wind uplift is achieved by this type of fixing.

2.3 The product has adequate resistance to soft-body impacts, such as a person accidentally falling against a rooflight, and can be classified as non-fragile in terms of Health and Safety Executive Specialist Inspector Reports No 30.

3 Thermal properties

The values given in Tables 4 and 5 can be used to determine U values, and heat losses as described in section 14 of the Front sheets.

4 Security against intrusion

4.1 Euroglaze Fixed Continuous Barrel Vault Rooflights are supplied with tamper-proof fixings (clutch-head screws), unless otherwise specified, to make removal of the rooflight from the upstand more difficult (see Figure 3).

4.2 Polycarbonate rooflights have a good resistance to impact, making breakage very difficult.

Table 4 Thermal properties of upstands

Upstand type	U value ⁽¹⁾ (Wm ⁻² K ⁻¹)	Height (mm)	Internal area per metre run (m ²)	Linear thermal transmittance (Wm ⁻¹ K ⁻¹)
PVC-U	2.57	250	0.267	0.69
Steel or aluminium	5.22	175	0.195	1.02
		288	0.300	1.56
Metal with 15 mm of perlite board ⁽²⁾	2.15	175	0.195	0.42
		288	0.300	0.65
Glass fibre with PU foam core	2.18	175	0.195	0.43
Adaptor upstand and with 6 mm of foam PVC sheet	3.43	100		

(1) Including 5 mm of bitumen felt.

(2) Thermal conductivity 0.055 Wm⁻¹K⁻¹.

Table 5 Thermal transmittance (U value) of double- and triple-skin barrel vault rooflights

Width (m)	Length (m)	Rise (m)	Nominal area of rooflight (m ²)	Overall area of glazing (m ²)	Nominal U value ⁽¹⁾ (Wm ⁻² K ⁻¹)		Maximum permitted area of rooflights as % of roof area for buildings other than dwellings			
					Double	Triple	England and Wales and Scotland ⁽²⁾		Northern Ireland ⁽²⁾	
							Double	Triple	Double	Triple
0.6	3	0.150	1.8	2.21	3.60	2.36	12.2	18.7	18.3	28.0
0.9	3	0.225	2.7	3.41	3.69	2.42	11.9	18.2	17.9	27.3
1.2	3	0.300	3.6	4.68	3.78	2.48	11.6	17.7	17.5	26.6
1.5	3	0.375	4.5	6.00	3.87	2.54	11.4	17.3	17.0	25.9
1.8	3	0.450	5.4	7.39	3.96	2.61	11.1	16.9	16.6	25.3
2.1	3	0.525	6.3	8.84	4.06	2.67	10.8	16.5	16.3	24.7
2.4	3	0.600	7.2	10.36	4.15	2.73	10.6	16.1	15.9	24.2

(1) Calculated values based on an average 12 mm wide cavity between skins.

(2) In Scotland and Northern Ireland the area of any upstand should be included in the area of rooflight and the overall maximum permitted area weighted in proportion to its U value.

Installation

5 General

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

5.2 Prior to installation of the rooflight, the roof must be checked by means of calculations or testing to ensure that it can carry the additional loads the installation may impose, strengthening the roof if necessary. This work must be carried out by a suitably-qualified person.

5.3 The rooflight upstand should be checked dimensionally to ensure the fit; and the rooflight should be checked for size before the unit is lifted to the roof.

5.4 Individual barrel vault units are dry joined together, as shown in Figure 1.

5.5 A rooflight should never be left in position without ensuring all its fixings are present and fully tightened.

5.6 Fixings for fixing Euroglaze upstands or adaptor upstands onto the roof structure are not supplied by the Certificate holder.

6 Procedure

Fixing Euroglaze GRP, galvanized steel and aluminium upstands to timber, metal or concrete roofs

6.1 Upstands are secured directly onto roof members or concrete 100 mm maximum from corners at 300 mm centres maximum including at the foot of each temporary bracing rod and butting plate. Butting plates, made from 6 mm thick aluminium, are supplied with one side fixed on standard profile upstands (100 mm overlap). The sealant strip supplied is stuck over the line of holes on adjacent upstand section before bolting through with the 15 mm long stainless steel bolts provided, dome heads on the inside of the upstand. Temporary bracing rods at approximately 2 m centres are recommended when upstands exceed 3 m lengths. These are removed when fixing the rooflights. When adaptor upstands are provided, the butting plate is supplied separately.

Fixing Euroglaze rooflights to Euroglaze GRP, galvanized steel or aluminium upstands (see Figure 4)

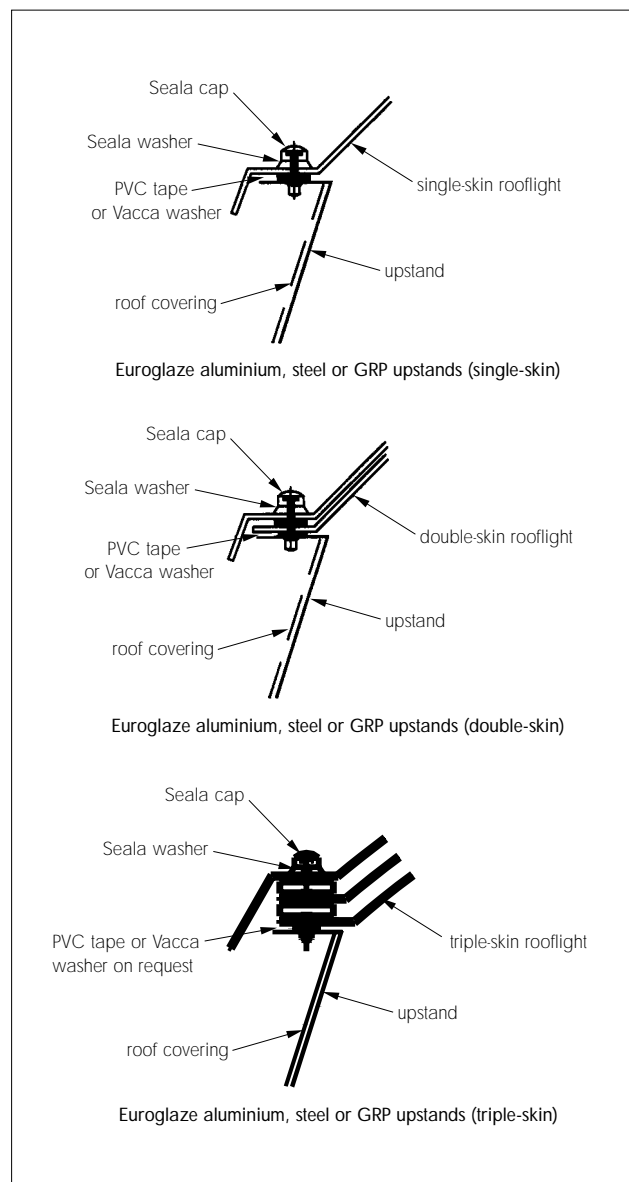
6.2 All the units are placed along the upstand with joining sections slightly raised, ensuring that they fit over the upstand before fixing commences.

6.3 The plastic rooflight is placed on the upstand and the positions of the holes on the rooflight are marked onto the upstand. Holes (8 mm diameter) are drilled through at those points, taking care to remove swarf from the upstand after drilling.

6.4 For single-skin barrel vault plastic rooflights the Vacca washer is placed on the upstand first, followed by the plastic rooflight and the PVC Seala washer. The bolt is fitted through the hole, the nut is attached and, after the bolt is tightened, the PVC Seala cap is fitted, ensuring that the nut is tightened fully against the underside of the flange.

6.5 Double- and triple-skin barrel vault plastic rooflights are provided with a loose roll of single-sided adhesive PVC tape which is to be fitted between the rooflight and the upstand. The protective paper is peeled off and the adhesive face is placed on the upstand, taking care not to stretch the tape. The tape should be mitred at corners and butt jointed. The PVC Seala washer is positioned on the rooflight and the bolt is fitted through the hole, a Nyloc nut attached and the bolt tightened, prior to the PVC Seala cap being fitted. Vacca washers can be specified on request as an alternative to PVC tape, where background ventilation is required.

Figure 4 Typical installation detail



The following is a summary of the technical investigations carried out on The Euroglaze Fixed Continuous Barrel Vault Rooflights and Upstands.

7 Tests

Tests were carried out in accordance with MOAT No 53 : 1989 to determine:

- effect of snow loads
- effect of impacts.

8 Investigations

8.1 The manufacturing process was examined, including the methods adopted for quality control, and details were obtained relating to the quality and composition of the materials.

8.2 A site visit was conducted to establish the product's performance and durability in service.

8.3 Computer calculations for assessing the risk of condensation and calculating the thermal transmittance of the rooflights were carried out.

8.4 An examination was made of existing data in relation to performance in fire and suitability of materials.

MOAT No 53 : 1989 *UEAtc guide for the Agrément of continuous strip rooflights*



On behalf of the British Board of Agrément

Date of issue: 20th October 2005

Chief Executive

Electronic Copy

British Board of Agrément

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

© 2005

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



For technical or additional information,
contact the Certificate holder (see
front page).
For information about the Agrément
Certificate, including validity and
scope, tel: Hotline 01923 665400,
or check the BBA website.



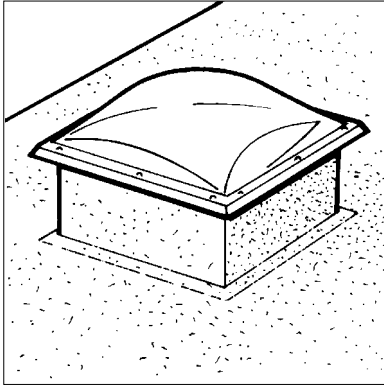
Bauder Ltd

THE EUROGLAZE FIXED XL3000 AND FIXED OR OPENING XL3000+ INDIVIDUAL ROOFLIGHTS AND PVC-U UPSTANDS

Certificate No 05/4279

DETAIL SHEET 4

Product



- THIS DETAIL SHEET RELATES TO THE EUROGLAZE FIXED XL3000 AND FIXED OR OPENING XL3000+ (MANUAL WORMGEAR) INDIVIDUAL ROOFLIGHTS AND PVC-U UPSTANDS.

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

Technical Specification

1 Description

1.1 The polycarbonate rooflights are designed and thermoformed from 3 mm minimum thick polycarbonate sheets, both sides coated with UV protection film, for use in the exposure conditions described in this Certificate.

1.2 The polycarbonate rooflights are available as double skin, in clear (smooth and stipple finish), bronze and opal colours and are fixed onto Euroglaze PVC-U upstands. Double-skin rooflights incorporate a double-sided adhesive PVC strip. XL3000 rooflights are available as fixed and XL3000+ as fixed or opening (manual wormgear), in dome and pyramid shape and in the styles and sizes listed in Table 1 and shown in Figures 1 and 2. Opening rooflights are supplied to site pre-assembled. Fixed rooflights can be supplied to site pre-assembled or separately.

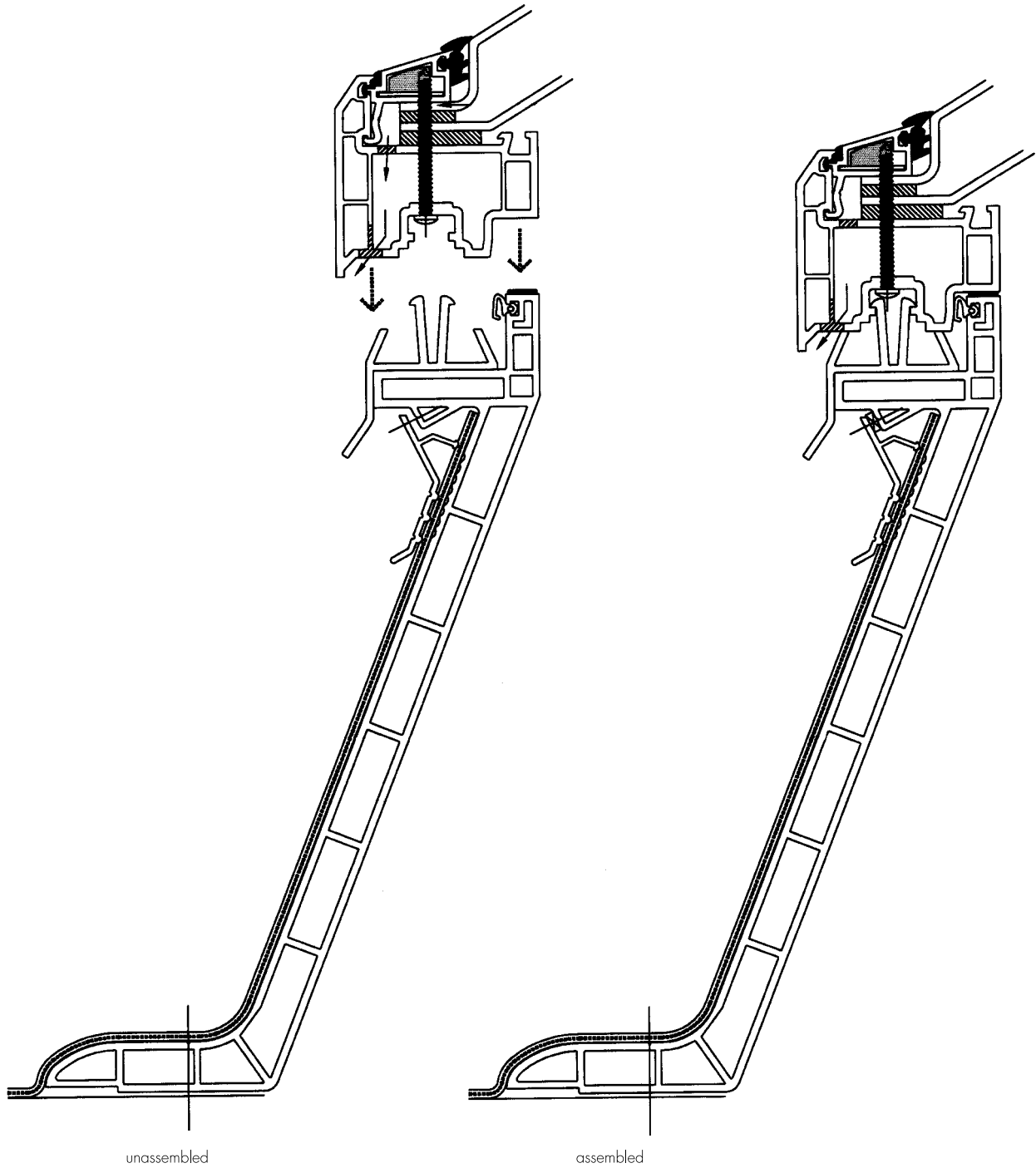
Table 1 Sizes of Euroglaze XL3000 and XL3000+ rooflights

Square (mm)	Rectangular (mm)
600 x 600	600 x 900
750 x 750	600 x 1200
900 x 900	600 x 1500
1050 x 1050	600 x 1800
1000 x 1000	600 x 2400
1200 x 1200	900 x 1200
1350 x 1350	900 x 1350
1500 x 1500	900 x 1500
1800 x 1800	900 x 1800
	900 x 2400
	1000 x 1500
	1000 x 2000
	1200 x 1500
	1200 x 1800
	1200 x 2400

1.3 Other sizes within this size range can also be fabricated on request and are covered by this Certificate.

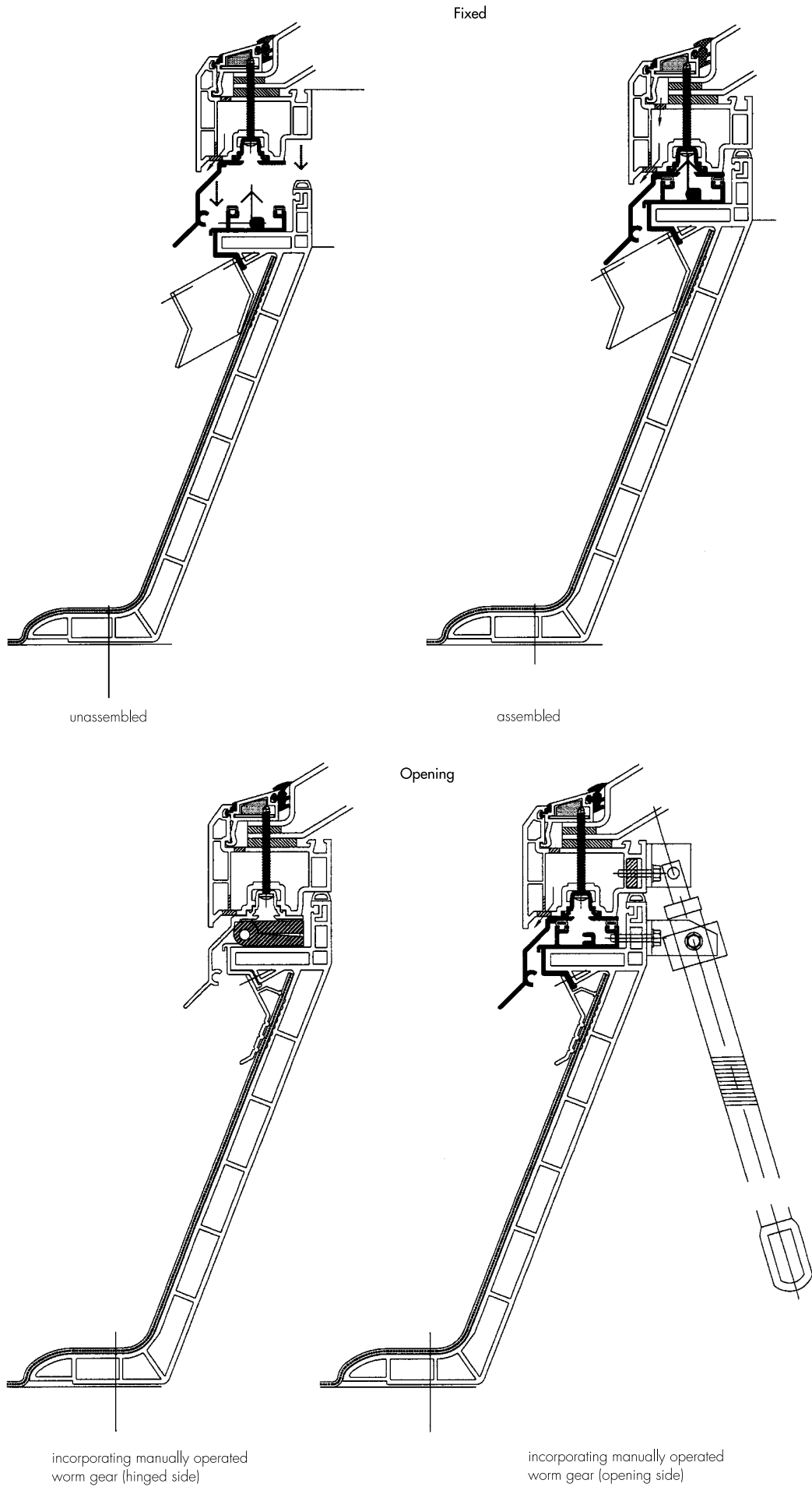
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Figure 1 Euroglaze XL3000 individual rooflights



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Figure 2 Euroglaze XL3000+ individual rooflights

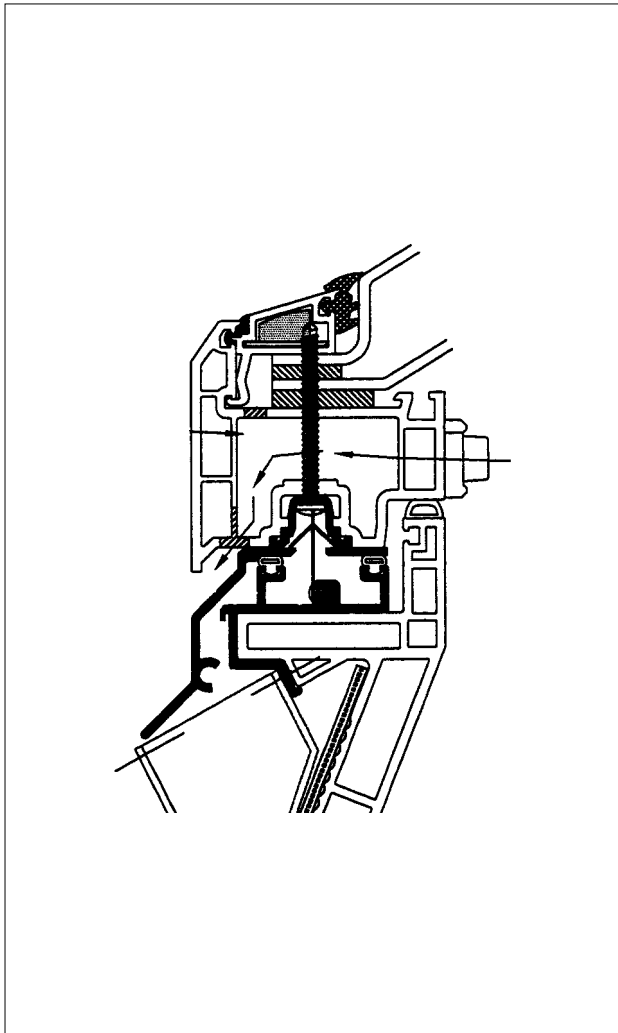


1.4 The PVC upstand is 237 mm high and is available in white finish. Holes for fixing upstands onto the roof structure are drilled on site. Upstands may be unvented or may incorporate permanent vents or hit-and-miss vents (see Table 2 and Figure 3).

Table 2 Euroglaze PVC-U upstands

Type	Upstands for individual rooflights
Unvented	XL 89
Permanent ventilation	XL 53
Hit-and-miss	XL 64

Figure 3 Typical vent detail



1.5 The full specifications and drawings for the materials and components covered by this Detail Sheet are retained by the BBA.

Euroglaze XL3000 rooflights

1.6 The double-skin polycarbonate rooflights are mounted into a PVC-U frame and retained by a PVC-U bead and TPE wedge gasket. The PVC-U rooflight assembly incorporates a PVC-U clip fixed to the PVC-U upstand with stainless steel screws (see Figure 1). The rooflight is secured to the upstand by pushing the PVC-U frame until it clips into position. A PVC foam sealer strip provides an inner seal between the upstand and the rooflight frame.

Euroglaze XL3000+ rooflights

1.7 The double-skin polycarbonate rooflights are mounted into a PVC-U frame and retained by a PVC-U bead and TPE wedge gasket. The PVC-U rooflight assembly incorporates an aluminium drip profile fixed to the PVC-U frame and bead with stainless steel screws (see Figure 2). The rooflight is secured to the upstand by means of stainless steel spring clips mounted on an aluminium retaining profile incorporating TPE weatherseals. A cellular EPDM strip provides an inner seal between the upstand and the rooflight frame.

1.8 Drainage is provided by means of concealed slots in the PVC-U frame.

1.9 Roof coverings are applied up to the external face of the upstand flange.

1.10 An extruded PVC-U cover is applied prior to top flange engagement and after application of upstand finishes.

Design Data

2 Strength and stability



2.1 Tests have shown that resistance to imposed snow loads and wind loads by the rooflights is dependent on size and configuration. As a guide, small pyramid-shaped rooflights are most resistant to imposed loads, whilst large, domed rooflights are the least resistant. Rooflights, therefore, should be selected according to the loads expected for a particular location. The results for selected rooflights tested in accordance with prEN 1873 : 1997 are given in Table 3.

2.2 The product has adequate resistance to soft-body impacts, such as a person accidentally falling against a rooflight, and can be classified as non-fragile in terms of the Advisory Committee for Roofwork, materials standard — ACR[M]001 : 2000.

Table 3 Resistance to snow and wind loads

Rooflight type	Snow load (downward load) (Nm ⁻²)	Wind load (upward load) (Nm ⁻²)
Pyramid (fixed) 1200 mm x 2400 mm	1750 (DL 1750)	1000 (UL 1000)
Domed (opening) 1200 mm x 2400 mm	1125 (DL 1125)	1500 (UL 1500)

3 Thermal properties

The values given in Tables 4 to 6 can be used to determine U values, solar gain and heat losses as described in section 14 of the Front sheets.

Table 4 Thermal properties of upstands and frames

Upstand type	U value ⁽¹⁾ (Wm ⁻² K ⁻¹)	Height (mm)	Internal area per metre run (m ²)	Linear thermal transmittance (Wm ⁻¹ K ⁻¹)
PVC-U	2.57	250	0.267	0.69
PVC-U frame (XL3000)	1.61	58	0.058	0.09
PVC-U frame (XL3000+)	2.57	61	0.061	0.16

(1) Including 5 mm of bitumen felt.

Table 5 Thermal transmittance (U values) of double-skinned dome rooflights

Width (m)	Length (m)	Rise (m)	Nominal area of rooflight (m ²)	Overall area of glazing (m ²)	Nominal U value ⁽²⁾ (Wm ⁻² K ⁻¹)	Maximum permitted area of rooflights as % of roof area for buildings other than dwellings	
						England and Wales and Scotland ⁽¹⁾	Northern Ireland ⁽¹⁾
0.6	0.6	0.12	0.360	0.434	3.44	12.8	19.2
0.75	0.75	0.15	0.563	0.677	3.44	12.8	19.2
0.9	0.9	0.18	0.810	0.976	3.44	12.8	19.2
1.0	1.0	0.20	1.000	1.204	3.44	12.8	19.2
1.05	1.05	0.21	1.103	1.328	3.44	12.8	19.2
1.2	1.2	0.24	1.440	1.734	3.44	12.8	19.2
1.35	1.35	0.27	1.823	2.195	3.44	12.8	19.2
1.5	1.5	0.30	2.250	2.710	3.44	12.8	19.2
1.8	1.8	0.36	3.240	3.902	3.44	12.8	19.2
0.6	0.9	0.12	0.540	0.624	3.32	13.2	19.9
0.6	1.2	0.12	0.720	0.818	3.27	13.5	20.2
0.6	1.5	0.12	0.900	1.013	3.25	13.6	20.3
0.6	1.8	0.12	1.080	1.209	3.23	13.6	20.4
0.6	2.4	0.12	1.440	1.602	3.21	13.7	20.5
0.9	1.2	0.18	1.080	1.260	3.35	13.1	19.7
0.9	1.35	0.18	1.215	1.404	3.32	13.2	19.9
0.9	1.5	0.18	1.350	1.549	3.30	13.3	20.0
0.9	1.8	0.18	1.620	1.840	3.27	13.5	20.2
0.9	2.4	0.18	2.160	2.425	3.24	13.6	20.4
1.0	1.5	0.20	1.500	1.733	3.32	13.2	19.9
1.0	2.0	0.20	2.000	2.271	3.27	13.5	20.2
1.2	1.5	0.24	1.800	2.113	3.37	13.1	19.6
1.2	1.8	0.24	2.160	2.496	3.32	13.2	19.9
1.2	2.4	0.24	2.880	3.270	3.27	13.5	20.2

(1) In Scotland and Northern Ireland the area of any upstand should be included in the area of rooflight and the overall maximum permitted area weighted in proportion to its U value.

(2) Calculated values based on an average 12 mm wide cavity between skins.

Table 6 Thermal transmittance (U values) of double-skinned pyramid rooflights

Width (m)	Length (m)	Rise (m)	Nominal area of rooflight (m ²)	Overall area of glazing (m ²)	Nominal U value ⁽²⁾ (Wm ⁻² K ⁻¹)	Maximum permitted area of rooflights as % of roof area for buildings other than dwellings	
						England and Wales and Scotland ⁽¹⁾	Northern Ireland ⁽¹⁾
0.6	0.6	0.214	0.360	0.442	3.48	12.6	19.0
0.75	0.75	0.268	0.563	0.691	3.48	12.6	19.0
0.9	0.9	0.321	0.810	0.995	3.48	12.6	19.0
1.0	1.0	0.357	1.000	1.229	3.48	12.6	19.0
1.05	1.05	0.375	1.103	1.355	3.48	12.6	19.0
1.2	1.2	0.429	1.440	1.770	3.48	12.6	19.0
1.35	1.35	0.482	1.823	2.240	3.48	12.6	19.0
1.5	1.5	0.536	2.250	2.765	3.48	12.6	19.0
1.8	1.8	0.643	3.240	3.982	3.48	12.6	19.0
0.6	0.9	0.214	0.540	0.631	3.33	13.2	19.8
0.6	1.2	0.214	0.720	0.825	3.28	13.4	20.1
0.6	1.5	0.214	0.900	1.021	3.26	13.5	20.3
0.6	1.8	0.214	1.080	1.219	3.24	13.6	20.4
0.6	2.4	0.214	1.440	1.616	3.23	13.6	20.4
0.9	1.2	0.321	1.080	1.276	3.37	13.1	19.6
0.9	1.35	0.321	1.215	1.419	3.33	13.2	19.8
0.9	1.5	0.321	1.350	1.564	3.31	13.3	19.9
0.9	1.8	0.321	1.620	1.856	3.28	13.4	20.1
0.9	2.4	0.321	2.160	2.445	3.25	13.5	20.3
1.0	1.5	0.357	1.500	1.752	3.34	13.2	19.8
1.0	2.0	0.357	2.000	2.291	3.28	13.4	20.1
1.2	1.5	0.429	1.800	2.143	3.39	13.0	19.5
1.2	1.8	0.429	2.160	2.523	3.34	13.2	19.8
1.2	2.4	0.429	2.880	3.299	3.28	13.4	20.1

(1) In Scotland and Northern Ireland the area of any upstand should be included in the area of rooflight and the overall maximum permitted area weighted in proportion to its U value.

(2) Calculated values based on an average 12 mm wide cavity between skins.

4 Security against intrusion

4.1 The design of the rooflight is such that individual fixings are not evident from outside. Removal of the reinforced PVC-U glazing bead is extremely difficult due to screw fixing from underneath, penetrating both the bead and the reinforcement.

4.2 The shape of the aluminium drip profile makes disengagement of the spring clips extremely difficult.

Installation

5 General

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

5.2 Prior to installation of the rooflight, the roof must be checked by means of calculations or testing to ensure that it can carry the additional loads the installation may impose, strengthening the roof if necessary. This work must be carried out by a suitably-qualified person.

5.3 The rooflight upstand should be checked dimensionally to ensure the fit, and the rooflight should be checked for size before the unit is lifted to the roof.

5.4 A rooflight should never be left in position without ensuring all its fixings are present and fully tightened.

5.5 Fixings for fixing Euroglaze PVC-U upstands onto the roof structure are not supplied by the Certificate holder.

6 Procedure

Fixing Euroglaze PVC-U upstands or pre-assembled Euroglaze XL3000 and XL3000+ rooflights to timber or metal roofs (see Figure 4)

6.1 The base flange of the upstand is placed on the roof deck and fixed with nickel-plated wood-screws (60 mm by No 10), roof bolts or proprietary fasteners with equivalent pull-out resistance onto timber roofs and self-drilling/tapping screws or similar onto metal roofs. Holes are drilled at the 'V' groove along the base flange, 100 mm maximum from corners and at 300 mm centres maximum.

Fixing Euroglaze PVC-U upstands or pre-assembled Euroglaze XL3000 and XL3000+ rooflights to concrete (see Figure 4)

6.2 Rawlplugs (60 mm) or equivalent must be inserted into concrete at the 'V' groove along the base flange, and secured with wood-screws (50 mm by No 10) 100 mm maximum from corners and at 300 mm centres maximum.

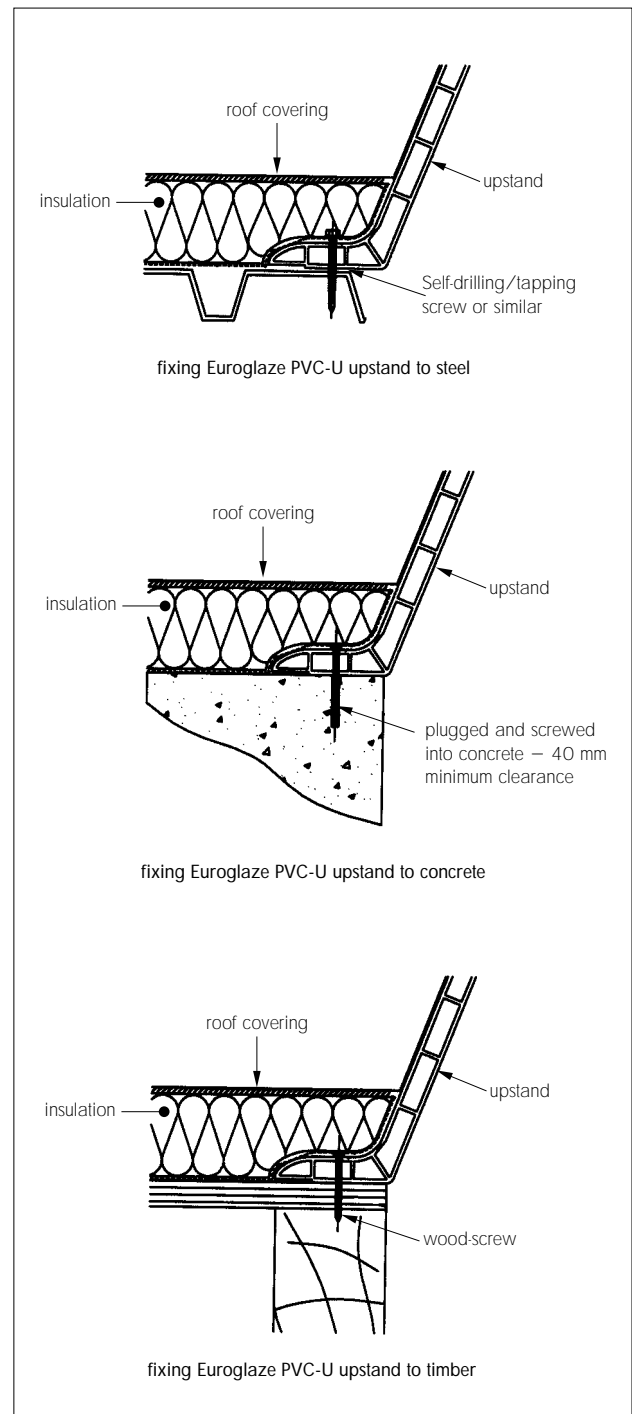
Fixing Euroglaze XL3000 fixed rooflights to Euroglaze PVC-U upstands

6.3 On completion of the upstand installation and roof finish, the rooflight is placed onto the PVC-U upstand and pressed until the PVC-U clips click into position.

Fixing Euroglaze XL3000+ fixed rooflights to Euroglaze PVC-U upstands

6.4 On completion of the upstand installation and roof finish, the rooflight is placed onto the PVC-U upstand and pressed until the stainless steel clips click into position.

Figure 4 Typical installation detail



The following is a summary of the technical investigations carried out on The Euroglaze Fixed XL3000 and Fixed or Opening XL3000+ Individual Rooflights and PVC-U Upstands.

7 Tests

7.1 Tests were carried out in accordance with MOAT No 1 : 1974, MOAT No 17 : 1990, MOAT No 54 : 1989, BS 5368-1 : 1976 and prEN 1873 : 1997 to determine:

- watertightness
- effect of wind loads
- effect of snow loads
- effect of impacts
- suitability of materials.

7.2 Additional tests were carried out to determine:

- effect of solar heating and thermal shock (BBA *ad hoc* method)
- resistance to intrusion (BBA *ad hoc* method).

8 Investigations

8.1 The manufacturing process was examined, including the methods adopted for quality control, and details were obtained relating to the quality and composition of the materials.

8.2 Computer calculations for assessing the risk of condensation and calculating the thermal transmittance of the rooflights were carried out.

8.3 An examination was made of existing data in relation to the PVC-U material and performance in fire.

8.4 Components were assessed for resistance to corrosion.

BS 5368-1 : 1976 *Methods of testing windows — Air permeability test*

prEN 1873 : 2000 *Roof coverings — Individual rooflights of plastics with upstands*

MOAT No 1 : 1974 *Directive for the Assessment of Windows*

MOAT No 17 : 1990 *UEAtc Technical Guide for the Agrément of windows in PVC-U*

MOAT No 54 : 1989 *UEAtc guide for the Agrément of individual rooflights*

Advisory Committee for Roofwork, ACR[M]001 : 2000 *Test For Fragility of Roofing Assemblies* [second edition]



On behalf of the British Board of Agrément

Date of issue: 20th October 2005

A handwritten signature in black ink, appearing to read 'G. A. Cooper', is written over a light grey background.

Chief Executive

Electronic Copy

British Board of Agrément

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

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



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