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Agrément Certificate

**03/3996**

Product Sheet 1

### IN-PLANE GRP ROOFLIGHTS

### ZENON PRO IN-PLANE GRP ROOFLIGHTS

This Agrément Certificate Product Sheet<sup>(1)</sup> relates to Zenon Pro In-plane GRP Rooflights, for use in pitched roofs of profiled sheet to admit natural daylight into non-domestic buildings.

(1) Hereinafter referred to as 'Certificate'.

#### CERTIFICATION INCLUDES:

- factors relating to compliance with Building Regulations where applicable
- factors relating to additional non-regulatory information where applicable
- independently verified technical specification
- assessment criteria and technical investigations
- design considerations
- installation guidance
- regular surveillance of production
- formal three-yearly review.



#### KEY FACTORS ASSESSED

**Light transmittance** — the system provides natural lighting to the interior of a building. See section 6 of this Certificate.

**Properties in relation to fire** — the system, when used as part of a complete roof, will not affect the fire rating of the roof construction. See section 7 of this Certificate.

**Strength and stability** — the system will resist imposed snow and wind loads and hard body impact. See section 8 of this Certificate.

**Thermal properties** — rooflights from within the range have thermal transmittances (U values) of up to  $0.8 \text{ W} \cdot \text{m}^{-2} \cdot \text{K}^{-1}$ , depending on the panel weight and construction of the Insulated honeycomb panel. See section 9 of this Certificate.

**Watertightness** — the system is watertight. See section 10 of this Certificate.

**Safety** — the system is resistant to soft body impact and is classified as a Category B non-fragile assembly. See section 11 of this Certificate.

**Durability** — the GRP material should have a life of at least 25 years. See section 13 of this Certificate.

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

On behalf of the British Board of Agrément

Date of First issue: 30 June 2015

John Albon — Head of Approvals  
Construction Products

Claire Curtis-Thomas  
Chief Executive

Originally certificated on 31 March 2003

*The BBA is a UKAS accredited certification body — Number 113. The schedule of the current scope of accreditation for product certification is available in pdf format via the UKAS link on the BBA website at [www.bbacerts.co.uk](http://www.bbacerts.co.uk)*

*Readers are advised to check the validity and latest issue number of this Agrément Certificate by either referring to the BBA website or contacting the BBA direct.*

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# Regulations

In the opinion of the BBA, Zenon Pro In-plane GRP Rooflights, if installed, used and maintained in accordance with this Certificate, will satisfy or contribute to satisfying the relevant requirements of the following Building Regulations (the presence of a UK map indicates that the subject is related to the Building Regulations in the region or regions of the UK depicted):



## The Building Regulations 2010 (England and Wales) (as amended)

|                     |                                                                                                                                                           |                                                        |
|---------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------|--------------------------------------------------------|
| <b>Requirement:</b> | <b>A1</b>                                                                                                                                                 | <b>Loading</b>                                         |
| <b>Comment:</b>     | The system will have sufficient strength and stiffness to sustain the design load. See sections 8.1, 8.2 and 11 of this Certificate.                      |                                                        |
| <b>Requirement:</b> | <b>B2</b>                                                                                                                                                 | <b>Internal fire spread (linings)</b>                  |
| <b>Comment:</b>     | The system must not be used where it is below the level of an existing fire escape or protected stairway. See section 7.3 of this Certificate.            |                                                        |
| <b>Requirement:</b> | <b>B4(2)</b>                                                                                                                                              | <b>External fire spread</b>                            |
| <b>Comment:</b>     | The system, when used as part of a complete roof, will not affect the fire rating of the roof construction. See sections 7.1 and 7.2 of this Certificate. |                                                        |
| <b>Requirement:</b> | <b>C2(b)</b>                                                                                                                                              | <b>Resistance to moisture</b>                          |
| <b>Comment:</b>     | The system will not adversely affect the resistance of the roof to the passage of moisture. See section 10.1 of this Certificate.                         |                                                        |
| <b>Requirement:</b> | <b>L1(a)(i)</b>                                                                                                                                           | <b>Conservation of fuel and power</b>                  |
| <b>Comment:</b>     | The system can contribute to satisfying this Requirement. See section 9 of this Certificate.                                                              |                                                        |
| <b>Regulation:</b>  | <b>7</b>                                                                                                                                                  | <b>Materials and workmanship</b>                       |
| <b>Comment:</b>     | The system is acceptable. See section 13.1 and the <i>Installation</i> part of this Certificate.                                                          |                                                        |
| <b>Regulation:</b>  | <b>26</b>                                                                                                                                                 | <b>CO<sub>2</sub> emission rates for new buildings</b> |
| <b>Comment:</b>     | See section 9 of this Certificate. The system can also contribute to light transmittance as referenced in section 6 of this Certificate.                  |                                                        |



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

|                    |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             |                                                         |
|--------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|---------------------------------------------------------|
| <b>Regulation:</b> | <b>8(1)(2)</b>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              | <b>Durability, workmanship and fitness of materials</b> |
| <b>Comment:</b>    | The use of the system satisfies the requirements of this Regulation. See sections 12.1, 13.1 and the <i>Installation</i> part of this Certificate.                                                                                                                                                                                                                                                                                                                                                                                                                          |                                                         |
| <b>Regulation:</b> | <b>9</b>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    | <b>Building standards applicable to construction</b>    |
| <b>Standard:</b>   | <b>1.1(b)</b>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               | <b>Structure</b>                                        |
| <b>Comment:</b>    | The system will have sufficient strength and stiffness to sustain design loads with reference to clause 1.1.1 <sup>(2)</sup> . See sections 8.1, 8.2 and 11 of this Certificate.                                                                                                                                                                                                                                                                                                                                                                                            |                                                         |
| <b>Standard:</b>   | <b>2.5</b>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  | <b>Internal linings</b>                                 |
| <b>Comment:</b>    | The system must not be used below the level of an existing fire escape, protected zone or a fire-fighting shaft. See section 7.3 of this Certificate.                                                                                                                                                                                                                                                                                                                                                                                                                       |                                                         |
| <b>Standard:</b>   | <b>2.8</b>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  | <b>Spread from neighbouring buildings</b>               |
| <b>Comment:</b>    | The system can be regarded as having a low vulnerability with reference to clause 2.8.1 <sup>(2)</sup> , and will not affect the fire rating of the roof construction. See sections 7.1 and 7.2 of this Certificate.                                                                                                                                                                                                                                                                                                                                                        |                                                         |
| <b>Standard:</b>   | <b>3.10</b>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 | <b>Precipitation</b>                                    |
| <b>Comment:</b>    | The system provides adequate resistance to the ingress of precipitation with reference to clause 3.10.1 <sup>(2)</sup> . See section 10.1 of this Certificate.                                                                                                                                                                                                                                                                                                                                                                                                              |                                                         |
| <b>Standard:</b>   | <b>6.1(b)</b>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               | <b>Carbon dioxide emissions<sup>(2)</sup></b>           |
| <b>Standard:</b>   | <b>6.2</b>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  | <b>Building insulation envelope<sup>(2)</sup></b>       |
| <b>Comment:</b>    | The system can contribute to satisfying these Standards, with reference to clauses 6.1.4 <sup>(2)</sup> , 6.2.1 <sup>(2)</sup> , 6.2.4 <sup>(2)</sup> , 6.2.8 <sup>(2)</sup> , 6.2.9 <sup>(2)</sup> , 6.2.11 <sup>(2)</sup> and 6.2.13 <sup>(2)</sup> . See section 9 of this Certificate.                                                                                                                                                                                                                                                                                  |                                                         |
| <b>Standard:</b>   | <b>7.1(a)(b)</b>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            | <b>Statement of sustainability</b>                      |
| <b>Comment:</b>    | The system can contribute to satisfying the relevant requirements of Regulation 9, Standards 1 to 6, and therefore will contribute to a construction meeting a bronze level of sustainability as defined in this Standard. In addition, the system can contribute to a construction meeting a higher level of sustainability as defined in this Standard, with reference to clauses 7.1.4 <sup>(2)</sup> [Aspect 1 <sup>(2)</sup> ] 7.1.6 <sup>(2)</sup> [Aspect 1 <sup>(2)</sup> ] and 7.1.7 <sup>(2)</sup> [Aspect 1 <sup>(2)</sup> ]. See section 9 of this Certificate. |                                                         |
| <b>Regulation:</b> | <b>12</b>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   | <b>Building standards applicable to conversions</b>     |
| <b>Comment:</b>    | All comments given for this system under Regulation 9, Standards 1 to 6, also apply to this Regulation, with reference to clause 0.12.1 <sup>(2)</sup> and Schedule 6 <sup>(2)</sup> .<br>(2) Technical Handbook (Non-Domestic).                                                                                                                                                                                                                                                                                                                                            |                                                         |



## The Building Regulations (Northern Ireland) 2012 (as amended)

|                    |                                                                                                  |                                             |
|--------------------|--------------------------------------------------------------------------------------------------|---------------------------------------------|
| <b>Regulation:</b> | <b>23</b>                                                                                        | <b>Fitness of materials and workmanship</b> |
| <b>Comment:</b>    | The system is acceptable. See section 13.1 and the <i>Installation</i> part of this Certificate. |                                             |

|             |          |                                                                                                                                                                        |
|-------------|----------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Regulation: | 28(b)    | Resistance to moisture and weather                                                                                                                                     |
| Comment:    |          | The system will not adversely affect the resistance of the roof to the passage of moisture. See section 10.1 of this Certificate.                                      |
| Regulation: | 30       | Stability                                                                                                                                                              |
| Comment:    |          | The system has sufficient strength and stiffness to sustain the design loads. See sections 8.1, 8.2 and 11 of this Certificate.                                        |
| Regulation: | 34       | Internal fire spread – Linings                                                                                                                                         |
| Comment:    |          | The system must not be used where it is below the level of an existing fire escape or protected stairway. See section 7.3 of this Certificate.                         |
| Regulation: | 36(b)    | External fire spread                                                                                                                                                   |
| Comment:    |          | The system, when used as part of a complete roof construction, will not affect the fire rating of the roof construction. See sections 7.1 and 7.2 of this Certificate. |
| Regulation: | 39(a)(i) | Conservation measures                                                                                                                                                  |
| Regulation: | 40(2)    | Target carbon dioxide emission rate                                                                                                                                    |
| Comment:    |          | The system can contribute to satisfying these Requirements. See section 9 of this Certificate.                                                                         |

## Construction (Design and Management) Regulations 2015

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

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

See section: 14.2 *Installation* of this Certificate.

## Additional Information

### NHBC Standards 2014

In the opinion of the BBA, the use of Zenon Pro In-plane GRP Rooflights, in relation to this Certificate, are not subject to the requirements of these Standards.

### CE marking

The Certificate holder has taken the responsibility of CE marking the system, in accordance with harmonised European Standard BS EN 1013 : 2012.

## Technical Specification

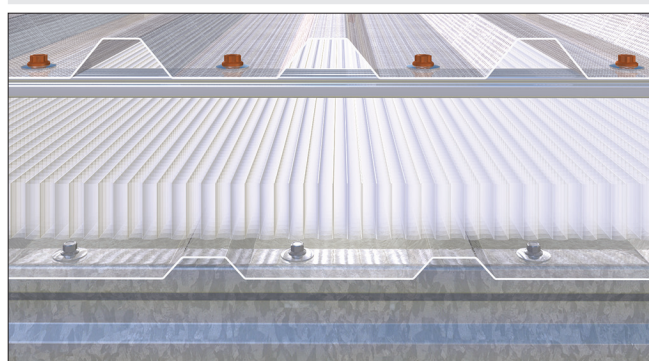
### 1 Description

1.1 Zenon Pro In-plane GRP rooflights consist of factory-produced, glassfibre reinforced polyester resin profiled sheets with an internal transparent honeycomb core, featuring a transparent capping film to curtail the movement of air within the honeycomb (See Figure 1).

1.2 The system is used in conjunction with roofing systems utilising profiled sheet materials and is at least double skinned with an internal transparent honeycomb insulating core element to reduce heat loss and minimise condensation.

1.3 All sheets are supplied in a natural translucent finish as standard and manufactured in sinusoidal, trapezoidal, or ribbed trapezoidal formats to match most fibre-cement, aluminium, and steel profiles. Flat sheets can also be supplied.

Figure 1 Zenon Pro In-Plane GRP Rooflight



1.4 GRP sheets are supplied in lengths to suit customer requirements. Widths conform to those of the metal profile sheets to be matched.

1.5 Surface protection against UV light is provided to the weather sheets by a proprietary polyethylene terephthalate (PET) surface film.

1.6 The rooflight is mechanically fixed to the roof construction using fastener types<sup>(1)</sup> as recommended by the Certificate holder.

(1) Outside the scope of this Certificate.

1.7 The GRP component is available in five standard product glass weights, 1.8 kg·m<sup>-2</sup>, 2.4 kg·m<sup>-2</sup>, 3.0 kg·m<sup>-2</sup>, 3.6 kg·m<sup>-2</sup> and 5.4 kg·m<sup>-2</sup>, with three grades of fire retardancy (see Table 1).

1.8 Ancillary items, not covered by this Product Sheet, but required for use with the system include:

- sealing tape — a butyl sealant tape.

1.9 The system is manufactured from a thermosetting material, rather than thermoplastic. Fire rating identification is by means of a coloured thread inserted into the sheet during manufacture (see Table 1).

*Table 1 Identification thread colours according to fire rating*

| BS 476-3 : 2004 | Identification thread |
|-----------------|-----------------------|
| S.AA            | Blue                  |
| S.AA            | Green                 |
| S.AB            | Red                   |

1.10 Standard fixings and flashing accessories<sup>(1)</sup> are available from the Certificate holder's nominated stockists.

(1) Outside the scope of this Certificate.

#### **Primary fixings** (not covered by this Certificate)

1.11 Primary fixings should have an adequate strength to resist the design load, imposed load and wind loading and maintain weathertightness. Also, where required by the cladding and support design, to provide adequate lateral restraint to substructure elements such as purlins and spacers. In addition, they may be required to accommodate some thermal movement in the direction of the profiles. This can be achieved by oversizing fixing holes, by elastic displacement, or purlins and spacers. Primary fixings are divided into two groups, rigid fixings and non-rigid fixings.

1.12 It is essential that the watertightness of fixings with fasteners penetrating the sheeting should remain effective when the sheeting is subjected to the maximum inward imposed loading including wind. Under such loads, the sheeting and any insulating substrate will compress and thereby tend to loosen the seal in the fastener, increasing the risk of water penetration. It is therefore important to ensure that the sheeting, substrate, and fastener including sealing washer, can provide adequate performance under these conditions.

1.13 Additional security can be obtained by the use of fasteners, which secure the sheeting against inward movement as well as against outward loads.

#### **Secondary fixings** (not covered by this Certificate)

1.14 The main function of secondary fixings is to maintain a tight lap and seal, but they are also required to transfer concentrated load to adjacent sheets.

1.15 When required, fasteners for secondary fixings, or stitch fasteners should be positioned at side laps on the crown for roof cladding, depending on the profile. The fastener and method of installation should be able to accommodate and compress a seal in the lap joint where a seal is used. The spacing of stitch fasteners depends on the thickness and the presence, or otherwise, of a sealant in the joint, but should generally be not more than 300 mm centres and not exceeding 450 mm.

1.16 When fixing into steel or non-metallic materials, all fixings should be of stainless steel. When fixing into or through aluminium, specialist advice should be obtained from either the fastener supplier or manufacturer to ensure compatibility.

## **2 Manufacture**

2.1 The Zenon Pro In-plane GRP Rooflights are manufactured in a continuous process using thermosetting polyester resins, containing curing agents, light stabilisers and glassfibre rovings or glassfibre mat.

2.2 As part of the assessment and ongoing surveillance of product quality, the BBA has:

- agreed with the manufacturer the quality control procedures and product testing to be undertaken
- assessed and agreed the quality control operated over batches of incoming materials
- monitored the production process and verified that it is in accordance with the documented process
- evaluated the process for management of nonconformities
- checked that equipment has been properly tested and calibrated
- undertaken to carry out the above measures on a regular basis through a surveillance process, to verify that the specifications and quality control operated by the manufacturer are being maintained.

2.3 The management system of Hambleside Danelaw Limited has been assessed and registered as meeting the requirements of BS EN ISO 9001 : 2008 (Certificate FM 23063) and BS EN ISO 14001 : 2004 (Certificate EMS 500154) by BSI.

## **3 Delivery and site handling**

3.1 The system is generally supplied on pallets. The GRP sheets should be stored on flat clean battens at 1 m centres. If the GRP sheets are to be stored on the site they should be stacked on edge, with an air gap between each unit, on a protected, dry, level surface under cover. Sheets stored outside without protection could be damaged, and entrapped water will cause the sheets to discolour in prolonged sunlight. The sheets should be checked regularly whilst stored to ensure that moisture has not penetrated the protective cover.

3.2 The Insulator honeycomb panels are supplied in weatherproof wrapping. The wrapping should not be removed on site until the insulating material is required for use and care should be taken to protect the Insulator panel from damage.

## Assessment and Technical Investigations

The following is a summary of the assessment and technical investigations carried out on Zenon Pro In-plane GRP Rooflights.

## Design Considerations

### 4 Use

The system is for use on pitched roofs of profiled sheet to admit natural daylight into non-domestic buildings.

### 5 Practicability of installation

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

### 6 Light transmittance

The light transmittance for individual sheets varies depending upon sheet weight. Assemblies containing intermediate insulating layers can vary depending upon the combination of sheet weights and insulating layer used. For design purposes, the total luminous transmittance of new material at normal incidence for the  $5.4 \text{ kg}\cdot\text{m}^{-2}$  glass weight GRP sheet is  $70.4\% \pm 2.6\%$  when measured generally in accordance with EN ISO 13468-2 : 2006.

### 7 Properties in relation to fire



7.1 The system can be classified as Class F according to BS EN 13501-1 : 2007.

7.2 In the opinion of the BBA, the system can be classified as  $B_{\text{ROOF}}(t4)$  in accordance with BS EN 13501-5 : 2005

7.3 The system must not be used where the original roof surface is used as an escape route in case of a fire, or is below the level of an existing fire escape.

### 8 Strength and stability



8.1 The system is designed to have adequate resistance to wind loads calculated in accordance with BS EN 1991-1-4 : 2005.

8.2 Tests confirm that the rooflights will support a distributed load of  $1.5 \text{ kN}\cdot\text{m}^{-2}$ . 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 EN 1991-1-3 : 2003 is used to calculate actual snow load when the rooflights are used in situations where a load greater than  $1.5 \text{ kN}\cdot\text{m}^{-2}$  can be expected.

8.3 The system 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 5 Joules caused no damage when applied at various points on the rooflights.

### 9 Thermal properties



9.1 The following factory-assembled Zenon Pro GRP Insulated Rooflight (see Product Sheet 3), 1005 mm wide by 2002 mm long, incorporating:

- SAB Class 3,  $2.4 \text{ kg}\cdot\text{m}^{-2}$  outer sheet
- 4 layers of 20 mm insulated honeycomb core
- 5 layers of polyester film capping sheet
- SAA Class 1,  $1.8 \text{ kg}\cdot\text{m}^{-2}$  inner sheet.

With a total panel thickness of 95.3 mm achieves a U value of  $0.8 \text{ W}\cdot\text{m}^{-2}\cdot\text{K}^{-1}$  when tested in accordance with BS EN ISO 12567-1 : 2000.

9.2 Calculations show that double-skinned rooflights without a honeycomb inner layer achieve an indicative U value of  $3.3 \text{ W}\cdot\text{m}^{-2}\cdot\text{K}^{-1}$ .

### 10 Weathertightness



10.1 The system will adequately resist the passage of moisture to the inside of the building and so meet the requirements of the national Building Regulations.

10.2 To achieve weathertightness it is essential that the joints and fittings are correctly installed as described in the manufacturer's literature.

10.3 The system is capable of accepting minor structural movements without damage or affecting the weathertightness.

## 11 Safety

 The system has a good resistance to impact from soft bodies, such as a person slipping on the roof. Tests on Zenon Pro In-plane GRP rooflight assemblies using a 1.8 kg·m<sup>-2</sup> top sheet showed that an impactor bag with an impact energy of 530 Joules gave a category B non-fragile rating according to document ACR(M)001 : 2014. In the opinion of the BBA, higher weight Zenon Pro sheets will also achieve at least Category B non-fragile assembly.

## 12 Maintenance

 12.1 If damage occurs, the rooflights and the fixings can be replaced, but these operations should be carried out using the materials covered by this Certificate.

12.2 Cleaning of the rooflights should be carried out using water containing non-abrasive soap. To avoid scratching the surface, only soft cloths should be used.

12.3 The external surface of the rooflights cannot be cleaned from the inside of the building. For maintenance and cleaning purposes special precautions must be taken, such as the provision of a catwalk, to allow safe access and to prevent the possibility of falling onto the rooflights although the rooflights will have sufficient resistance in the event of an accidental fall. For ways of complying with the requirements of the Building Regulations see:

**England** — Approved Document K5.4

**Wales** — Approved Document N4

**Scotland** — Standard 4.8(c), clauses 4.8.3<sup>(2)</sup> and 4.8.4<sup>(2)</sup>

<sup>(2)</sup> Technical Handbook (Non-Domestic).

**Northern Ireland** — Technical Booklet V, Section 5.

## 13 Durability

 13.1 The GRP material component of the system will perform satisfactorily for a period of at least 25 years.

13.2 Some slight colour change of the GRP material may occur over the life of the system but this should not normally have a significant adverse effect on the transmission of light.

## Installation

### 14 General

14.1 Application must be carried out in strict accordance with the relevant clauses of the Certificate holder's instructions and this Certificate (see Figures 2 and 3).

14.2 For safety reasons, the system should not be installed in high winds.

Figure 2 Fixing detail for site-assembled rooflights (along section)

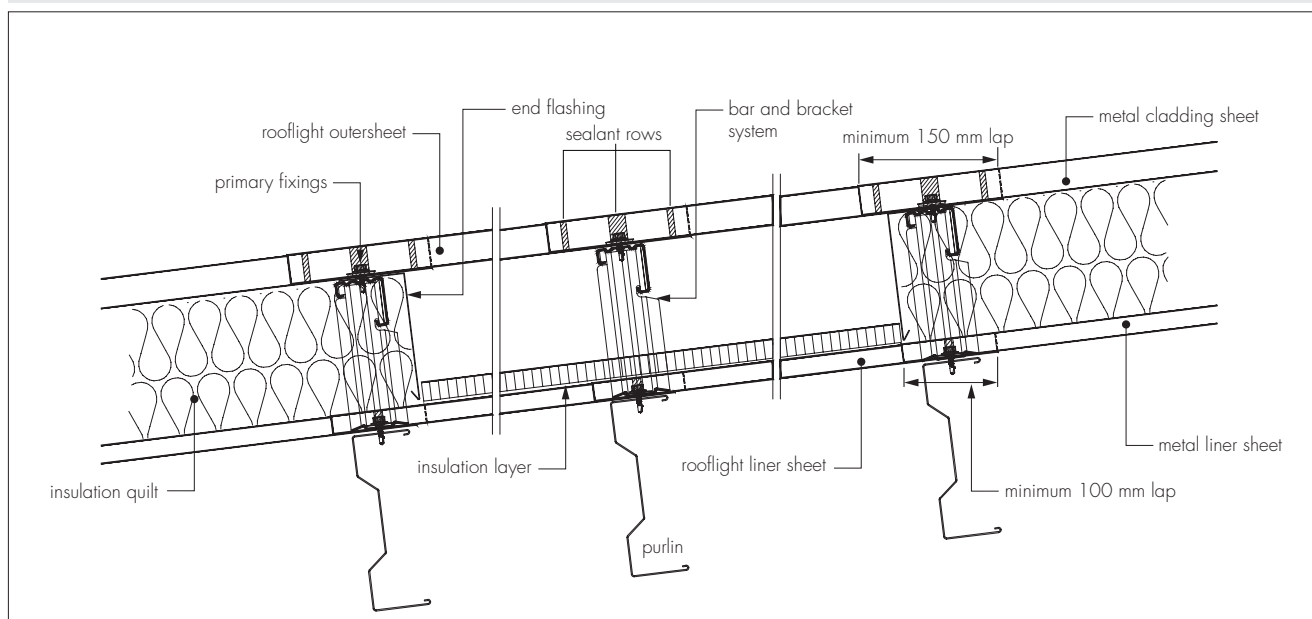
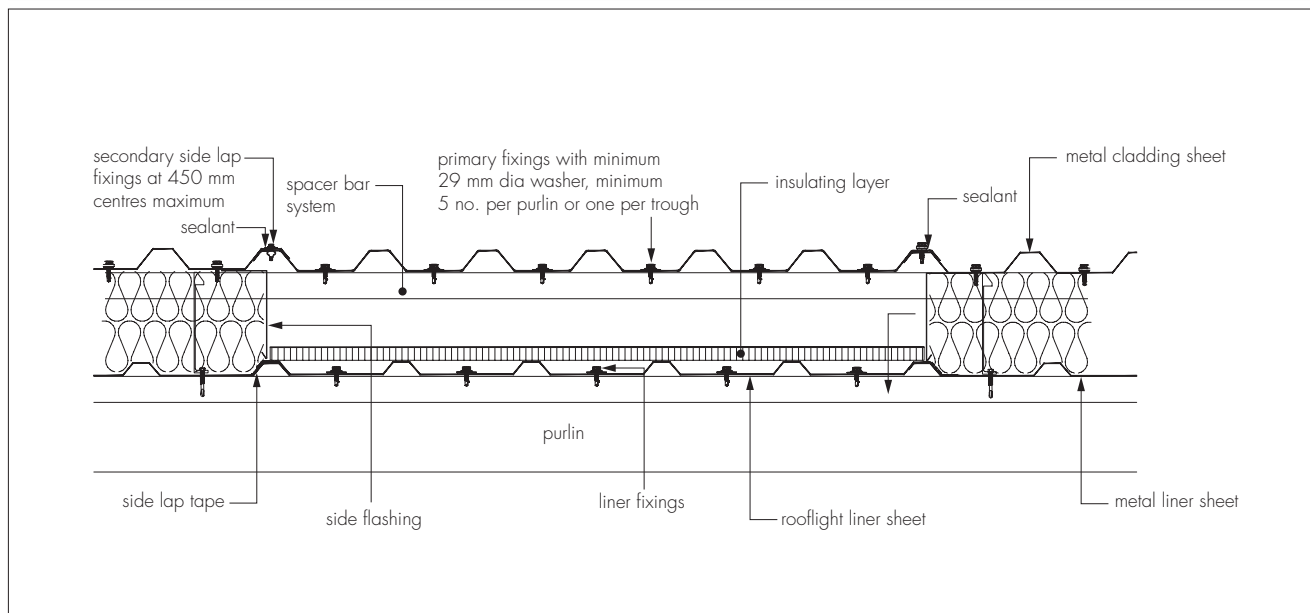


Figure 3 Fixing detail for site-assembled rooflights (cross section)



14.3 The GRP sheets have different properties to fibre cement, steel and aluminium sheets and they do not necessarily have the same span capabilities (see Table 2).

Table 2 Maximum span between purlins for Zenon Pro top sheet

| Depth of profile<br>(mm) | Sheet Weights      |        |        |        |        |
|--------------------------|--------------------|--------|--------|--------|--------|
|                          | Pro 18             | Pro 24 | Pro 30 | Pro 36 | Pro 54 |
|                          | Purlin Centres (m) |        |        |        |        |
| 15 to 20                 | 1.25               | 1.50   | 1.60   | 1.65   | 1.80   |
| 21 to 25                 | 1.50               | 1.75   | 1.80   | 1.90   | 2.40   |
| 26 to 30                 | 1.60               | 1.85   | 2.00   | 2.10   | 2.80   |
| 31 to 35                 | 1.80               | 2.05   | 2.20   | 2.35   | 2.90   |
| Over 35                  | 2.00               | 2.25   | 2.40   | 2.50   | 3.00   |

## 15 Procedure

15.1 The system should be fastened to the steelwork structure in every trough of the profile using self-drilling and self-tapping fixings with minimum 29 mm self-sealing washers. Profile configurations with wide troughs will need two fixings per trough. Fixings are generally recommended to be manufactured in stainless steel.

15.2 Primary fixings should be positioned along and secured to the lines of purlins, sheeting rails or spacers. End laps in profiled sheeting should be arranged to occur over purlin, sheeting rail or spacer lines and secured by the same primary fixings.

15.3 Along the purlin, sheeting rail or spacer lines, the primary fixings should be spaced so as to maintain a tight end lap, resist the wind suction loads on the cladding and fasteners, in accordance with the manufacturer's instructions and avoid vibration of the sheeting.

15.4 Fasteners for primary fixings should preferably be fixed through the troughs, however for sinusoidal profiled sheets, the primary fixing is generally through the crown of the profile.

15.5 It is recommended that side laps be stitched at 300 mm centres but must not exceed 450 mm centres and should be sealed with one run of 6 mm by 5 mm cross-linked sealant (butyl type) or equivalent. The manufacturer can advise on suitable materials.

15.6 Head and tail laps should be sealed using two strips of 6 mm by 5 mm, cross-linked sealant (butyl type) 50 mm apart and either side of the line fasteners with an additional strip of sealant 6 mm by 5 mm or 8 mm diameter, 10 mm from the exposed edge of the sheet at both head and tail. Alternatively, one strip of 18 mm by 4 mm U section sealant, placed centrally along the line of fasteners, with additional strips of 8 mm diameter sealant, placed 10 mm from the edge of the sheet laps to both sides of the main sealant strip, may be used.

15.7 The Insulator honeycomb panel should be laid into position on top of the liner panel and is designed to take up any fluctuations in the internal measurements of the rooflights.

The following is a summary of the technical investigations carried out on Zenon Pro In-plane GRP Rooflights.

### 16 Tests

Samples and components of the system were obtained from the manufacturer for the purpose of testing. Tests were performed by the BBA and other UKAS accredited laboratories on the GRP rooflight material:

- density
- hard body impact
- fixings pull-through strength
- light transmission
- ash content
- resistance to snow loading
- resistance to soft body impact
- resistance to point loading
- resistance to staining.

### 17 Investigations

17.1 The manufacturing process was evaluated, including the methods adopted for quality control, and details were obtained of the quality and composition of the materials used.

17.2 Installation was examined in the preparation of test specimens to establish the practicability of the materials used.

17.3 An assessment was made of European fire data to BS EN 13501-1 : 2007 and BS EN 13501-5 : 2005.

## Bibliography

BS 476-3 : 2004 *Fire tests on building materials and structures — Classification and method of test for external fire exposure to roofs*

BS EN 1013 : 2012 *Light transmitting single skin profiled plastic sheets for internal and external roofs, walls and ceilings — Requirements and test methods*

BS EN 1991-1-3 : 2003 *Eurocode 1 : Actions on structures — General actions — Snow loads*

BS EN 1991-1-4 : 2005 *Eurocode 1 : Actions on structures — General actions — Wind actions*

BS EN 13501-1 : 2007 *Fire classification of construction products and building elements — Classification using test data from reaction to fire tests*

BS EN 13501-5 : 2005 *Fire classification of construction products and building elements — Classification using data from external fire exposure to roof tests*

BS EN ISO 9001 : 2008 *Quality management systems — Requirements*

BS EN ISO 12567-1 : 2010 *Thermal performance of windows and doors — Determination of thermal transmittance by the hot-box method — Complete windows and doors*

BS EN ISO 14001 : 2004 *Environmental Management systems — Requirements with guidance for use*

EN ISO 13468-2 : 2006 *Plastics — Determination of the total luminous transmittance of transparent materials — Double-beam instrument*

Advisory Committee for Roofwork, ACR(M)001 : 2014 *Test for Non-fragility of Large Element Roofing Assemblies (fifth edition)*

## 18 Conditions

18.1 This Certificate:

- relates only to the product/system that is named and described on the front page
- is issued only to the company, firm, organisation or person named on the front page — no other company, firm, organisation or person may hold or claim that this Certificate has been issued to them
- is valid only within the UK
- has to be read, considered and used as a whole document — it may be misleading and will be incomplete to be selective
- is copyright of the BBA
- is subject to English Law.

18.2 Publications, documents, specifications, legislation, regulations, standards and the like referenced in this Certificate are those that were current and/or deemed relevant by the BBA at the date of issue or reissue of this Certificate.

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

- are maintained at or above the levels which have been assessed and found to be satisfactory by the BBA
- continue to be checked as and when deemed appropriate by the BBA under arrangements that it will determine
- are reviewed by the BBA as and when it considers appropriate.

18.4 The BBA has used due skill, care and diligence in preparing this Certificate, but no warranty is provided.

18.5 In issuing this Certificate, the BBA is not responsible and is excluded from any liability to any company, firm, organisation or person, for any matters arising directly or indirectly from:

- the presence or absence of any patent, intellectual property or similar rights subsisting in the product/system or any other product/system
- the right of the Certificate holder to manufacture, supply, install, maintain or market the product/system
- actual installations of the product/system, including their nature, design, methods, performance, workmanship and maintenance
- any works and constructions in which the product/system is installed, including their nature, design, methods, performance, workmanship and maintenance
- any loss or damage, including personal injury, howsoever caused by the product/system, including its manufacture, supply, installation, use, maintenance and removal
- any claims by the manufacturer relating to CE marking.

18.6 Any information relating to the manufacture, supply, installation, use, maintenance and removal of this product/system which is contained or referred to in this Certificate is the minimum required to be met when the product/system is manufactured, supplied, installed, used, maintained and removed. It does not purport in any way to restate the requirements of the Health and Safety at Work etc. Act 1974, or of any other statutory, common law or other duty which may exist at the date of issue or reissue of this Certificate; nor is conformity with such information to be taken as satisfying the requirements of the 1974 Act or of any statutory, common law or other duty of care.