

## Statement of Verification

BREG EN EPD No.: 000250

Issue 1

This is to verify that the  
**Environmental Product Declaration**  
provided by:  
**Hambleside Danelaw Ltd**



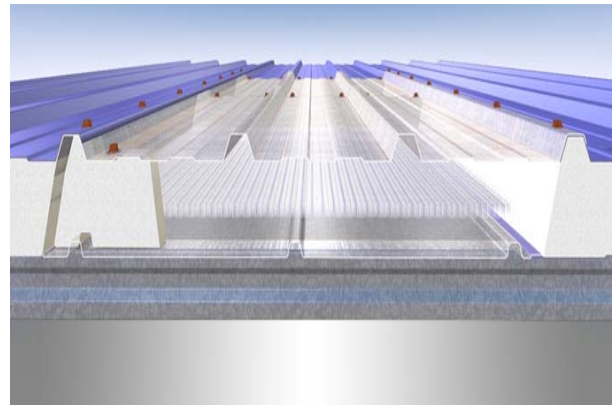
is in accordance with the requirements of:  
**EN 15804:2012+A1:2013**

and  
**BRE Global Scheme Document SD207**

This declaration is for:  
**FAIR (Factory Assembled) Zenon Evolution LC1/ Insulator/  
Zenon Pro**

### Company Address

Hambleside Danelaw Ltd  
Long March  
Daventry  
Northamptonshire  
NN11 4NR



**ZENON**<sup>®</sup>  
A Hambleside Danelaw Ltd brand

  
Signed for BRE Global Ltd

Laura Critien  
Operator

14 February 2019  
Date of this Issue

14 February 2019  
Date of First Issue

13 February 2024  
Expiry Date



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# Environmental Product Declaration

**EPD Number: 000250**

## General Information

| EPD Programme Operator  | Applicable Product Category Rules   |
|---|---|
| BRE Global<br>Watford, Herts<br>WD25 9XX<br>United Kingdom  | BRE Environmental Profiles 2013 Product Category Rules for Type III environmental product declaration of construction products to EN 15804:2012+A1:2013 |
| Commissioner of LCA study   | LCA consultant/Tool   |
| Hambleside Danelaw Ltd<br>Long March<br>Daventry<br>Northamptonshire<br>NN11 4NR                                | BRE LINA tool   |
| Declared/Functional Unit  | Applicability/Coverage  |
| 1 linear metre of FAIR (Factory Assembled) Zenon Evolution LC1/ Insulator/ Zenon Pro rooflight weighing 5.2 kgs | Product Average.  |
| EPD Type  | Background database   |
| Cradle to Gate with options   | ecoinvent   |

### Demonstration of Verification

CEN standard EN 15804 serves as the core PCR <sup>a</sup>

Independent verification of the declaration and data according to EN ISO 14025:2010

Internal  External

(Where appropriate <sup>b</sup>)Third party verifier:  
Nigel Jones

a: Product category rules

b: Optional for business-to-business communication; mandatory for business-to-consumer communication (see EN ISO 14025:2010, 9.4)

### Comparability

Environmental product declarations from different programmes may not be comparable if not compliant with EN 15804:2012+A1:2013. Comparability is further dependent on the specific product category rules, system boundaries and allocations, and background data sources. See Clause 5.3 of EN 15804:2012+A1:2013 for further guidance

## Information modules covered

| Product                             |                                     |                                     | Construction                        |                                     | Use stage                      |                          |                          |                          |                          |                          |                          | End-of-life               |                          |                          |                                     | Benefits and loads beyond the system boundary |
|-------------------------------------|-------------------------------------|-------------------------------------|-------------------------------------|-------------------------------------|--------------------------------|--------------------------|--------------------------|--------------------------|--------------------------|--------------------------|--------------------------|---------------------------|--------------------------|--------------------------|-------------------------------------|---|
|                                     |                                     |                                     |                                     |                                     | Related to the building fabric |                          |                          |                          |                          | Related to the building  |                          |                           |                          |                          |                                     |   |
| A1                                  | A2                                  | A3                                  | A4                                  | A5                                  | B1                             | B2                       | B3                       | B4                       | B5                       | B6                       | B7                       | C1                        | C2                       | C3                       | C4                                  | D   |
| Raw materials supply                | Transport                           | Manufacturing                       | Transport to site                   | Construction – Installation         | Use                            | Maintenance              | Repair                   | Replacement              | Refurbishment            | Operational energy use   | Operational water use    | Deconstruction demolition | Transport                | Waste processing         | Disposal                            | Reuse, Recovery and/or Recycling potential    |
| <input checked="" type="checkbox"/> | <input checked="" type="checkbox"/> | <input checked="" type="checkbox"/> | <input checked="" type="checkbox"/> | <input checked="" type="checkbox"/> | <input type="checkbox"/>       | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/>  | <input type="checkbox"/> | <input type="checkbox"/> | <input checked="" type="checkbox"/> | <input type="checkbox"/>                      |

Note: Ticks indicate the Information Modules declared.

## Manufacturing site(s)

|  |  |
|--|--|
| Hambleside Danelaw Ltd<br>Long March<br>Daventry<br>Northamptonshire<br>NN11 4NR |  |
|--|--|

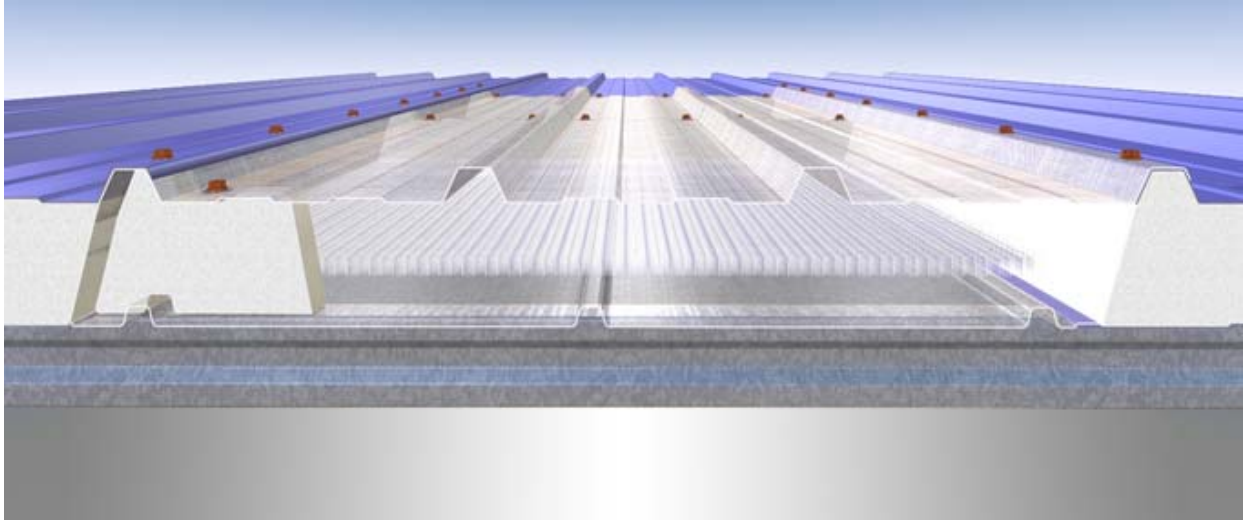
## Construction Product

### Product Description

Zenon in-plane composite panel rooflights, also referred to as factory assembled insulated rooflights (FAIRs), typically comprise of Zenon Evolution weather sheet and Zenon Pro liner panel configurations to suit the building requirements (other product weight combinations are also available). Where insulated assemblies are required to meet Building Regulations and to improve building performance, the unique Insulator core is used.

### Technical Information

| Property  | Value, Unit   |
|---|---|
| Harmonised Technical Specification EN 1013:2012 + A1:2014 | N.B. NPD = No performance declared  |
| External fire performance                                 | NPD - UK fire ratings declared separately                                       |
| Reaction to fire  | NPD - UK fire ratings declared separately                                       |
| Water vapour permeability                                 | 1.5 x 10 <sup>-5</sup> mg(m.h.Pa)   |
| Water / air permeability                                  | Pass  |
| Dimensional tolerances                                    | Pass  |
| Large soft body impact resistance (assembly)              | NPD. Performance to ACR(M)001 declared separately in accordance with NARM NTD03 |
| All other properties                                      | NPD   |



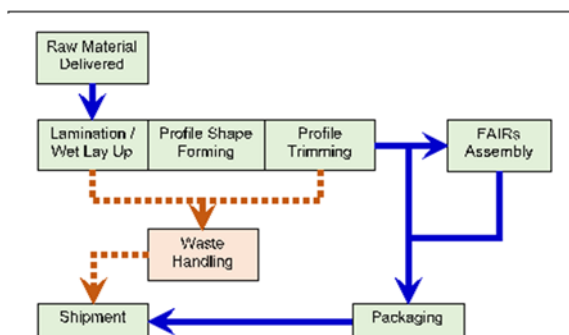
### Main Product Contents

| Material/Chemical Input                      | %  |
|--|----|
| <b>GRP Sheet</b>                             |    |
| GRP resin                                    | 45 |
| Glass fibre                                  | 32 |
| Minor chemicals                              | 1  |
| Film   | 3  |
| <b>FAIRs</b>                                 |    |
| Foam filler                                  | 5  |
| Steel strip                                  | 2  |
| Minor assembly components (sealant)          | 3  |
| Intermediate insulation components (plastic) | 9  |

### Manufacturing Process

The mixed raw materials are sandwiched between carrier film, heated and formed into shape. Once the product has cured, it is cut to length and width. If the GRP is being used in a multi-skin factory assembled application (FAIR) then it undergoes an additional process to bond the layers together.

## Process flow diagram



## Construction Installation

### 1. Rooflight Composite Panel

GRP (Glass Reinforced Polyester) rooflights, in a variety of profiles, different specifications and weights to meet all customer requirements.

### 2. Primary Fixings

There should always be a minimum of 5 fixings per purlin. These fixings should have a minimum 29mm diameter self-sealing washer with a poppy red cap. Due to differences in design profiles available, the number and position of fixings varies. Ideally, the fixings should be positioned as evenly as possible across the profile of the sheet and central to each trough. Wider troughs may need two each.

### 3. Zenon Insulator Core

As an alternative to multi-layered polycarbonate insulants, the lightweight cellulose acetate honeycomb core provide varying levels of thermal insulation in accordance with the required specification depending upon the thickness of the layer with no detrimental effect on light transmission. The core is simply laid directly over the rooflight liner sheet.

### 4. Side Stitch Fastener

A sidelap stitch fastener is used when fixing the rooflight sidelaps over the metal profile. These fixings should have a poppy red cap and use a minimum of a 16mm diameter self-sealing washer and be placed at a maximum of 400mm centres. When not using a steel fixing strip incorporated into the rooflight construction, an expanding grommet type fastener should be used to fasten the side lap of the metal over the rooflight. When using a Zenon Evolution outer sheet the steel fixing strip is not required, and side stitch fasteners may still be used.

### 5. Steel Fixing Strip

An optional galvanised steel strip is fitted into the rooflight during fabrication enabling the installer to use standard sidelap stitchers.

### 6. Sidelap Sealant

The sidelap sealant is essential and must be installed on the crown of the underlapping panel. The sealant should be a continuous 6x5mm butyl type strip.

### 7. End Lap Sealant

The sealant strips should be 6x5mm, 6mm Ø or 8mm Ø bead butyl type strip sealant. Two strips should be positioned approximately 10 to 15mm either side of the fixing, and a further strip positioned 15mm from the outer end lap.

Where a better seal is required at the bottom of the lap to keep out dirt and trapped water, a bead of premium quality neutral cure silicone sealant positioned approximately 10 to 15mm from the bottom of the lap may be used as an alternative to the butyl strip.

### 8. Spreader Plate

A spreader plate is recommended to ensure that the composite panels and rooflights have a secure bearing. The composite rooflight must bear onto the purlin or spreader plate by no less than 25mm.

## Use Information

Maintenance - Clean periodically with warm water and soap solution, avoid harsh detergents. Remove persistent stains by rubbing with a bristle brush. Remove tar and grease with white spirit.

Repairs - Dependent upon condition. Repairs sometimes possible; seek advice from Technical Department.

## End of Life

At the end of life the product can be disposed of via landfill or alternatively can be sent to an Energy from waste (EFW) plant where it is converted to SRF (Solid Recovery Fuel). Following this sophisticated SRF manufacturing process, the end product produced has a high calorific value and is a resource from which energy can be harnessed. It is used in cement kilns, paper mills and power stations as an alternative to fossil fuels. However as the end of life options are site dependent the worst case scenario of landfill has been used.

## Life Cycle Assessment Calculation Rules

### Declared / Functional unit description

Declared unit: 1 linear metre of FAIR (Factory Assembled) Zenon Evolution LC1/ Insulator/ Zenon Pro rooflight weighing 5.2 kgs

### System boundary

This is a cradle to gate with options EPD (i.e. processes covered in the extraction and processing in modules A1 to A3), the construction stage in modules A4 and A5 and end of life scenario in module C4.

### Data sources, quality and allocation

Manufacturer-specific data from Hambleside Danelaw Ltd covering a production period of 1 year [01/07/2017 to 30/06/2018] from the Daventry site has been used for this EPD.

Additional components for FAIRs and additional optional components for enhanced FAIRs options have been allocated by FAIRs assembly BOM/FAIRs assembly yield.

Additional components for stated Site Assembled combinations have been allocated by site assembly BOM/FAIRs assembly yield.

Energy, water and waste have been scaled by production output in GRP linear metres run. FAIRs & Site assembled systems have been treated as double GRP skinned. Therefore energy, water and waste have been calculated by total site usage x production output of product (m) / Total production output of whole site (m) x (x1 if single GRP skin or x2 if double GRP skin)

### Cut-off criteria

Data collected at the Daventry manufacturing site was used. The inventory process in this LCA includes all data related to raw material, packaging material and consumable items, and the associated transport to the manufacturing site. Process energy and water use and direct production waste are included.

## LCA Results

(MND = module not declared; MNR = module not relevant; INA = indicator not assessed; AGG = aggregated)

| Parameters describing environmental impacts |                          |      | GWP                       | ODP              | AP                        | EP   | POCP                                    | ADPE         | ADPF                     |
|---|--------------------------|------|---------------------------|------------------|---------------------------|--|---|--------------|--------------------------|
|   |                          |      | kg CO <sub>2</sub> equiv. | kg CFC 11 equiv. | kg SO <sub>2</sub> equiv. | kg (PO <sub>4</sub> ) <sup>3-</sup> equiv. | kg C <sub>2</sub> H <sub>4</sub> equiv. | kg Sb equiv. | MJ, net calorific value. |
| Product stage                               | Raw material supply      | A1   | AGG                       | AGG              | AGG                       | AGG  | AGG                                     | AGG          | AGG                      |
|   | Transport                | A2   | AGG                       | AGG              | AGG                       | AGG  | AGG                                     | AGG          | AGG                      |
|   | Manufacturing            | A3   | AGG                       | AGG              | AGG                       | AGG  | AGG                                     | AGG          | AGG                      |
|   | Total (of product stage) | A1-3 | 2.95E+01                  | 3.16E-06         | 1.22E-01                  | 4.85E-02                                   | 2.57E-02                                | 4.48E-04     | 5.01E+02                 |
| Construction process stage                  | Transport                | A4   | 1.82E-01                  | 3.34E-08         | 6.08E-04                  | 1.60E-04                                   | 1.06E-04                                | 4.79E-07     | 2.74E+00                 |
|   | Construction             | A5   | 1.46E+00                  | 2.86E-07         | 9.35E-03                  | 4.58E-03                                   | 1.35E-03                                | 7.09E-05     | 2.90E+01                 |
| End of life                                 | Disposal                 | C4   | 4.57E-01                  | 1.45E-08         | 4.21E-04                  | 3.83E-02                                   | 1.40E-04                                | 8.12E-08     | 1.33E+00                 |

GWP = Global Warming Potential;  
 ODP = Ozone Depletion Potential;  
 AP = Acidification Potential for Soil and Water;  
 EP = Eutrophication Potential;

POCP = Formation potential of tropospheric Ozone;  
 ADPE = Abiotic Depletion Potential – Elements;  
 ADPF = Abiotic Depletion Potential – Fossil Fuels;

| Parameters describing resource use, primary energy |                          |      | PERE     | PERM     | PERT     | PENRE    | PENRM    | PENRT    |
|--|--------------------------|------|----------|----------|----------|----------|----------|----------|
|  |                          |      | MJ       | MJ       | MJ       | MJ       | MJ       | MJ       |
| Product stage                                      | Raw material supply      | A1   | AGG      | AGG      | AGG      | AGG      | AGG      | AGG      |
|  | Transport                | A2   | AGG      | AGG      | AGG      | AGG      | AGG      | AGG      |
|  | Manufacturing            | A3   | AGG      | AGG      | AGG      | AGG      | AGG      | AGG      |
|  | Total (of product stage) | A1-3 | 3.93E+01 | 2.88E-03 | 3.93E+01 | 5.42E+02 | 0.00E+00 | 5.42E+02 |
| Construction process stage                         | Transport                | A4   | 3.64E-02 | 1.36E-07 | 3.64E-02 | 2.73E+00 | 0.00E+00 | 2.73E+00 |
|  | Construction             | A5   | 1.61E+00 | 1.10E-05 | 1.61E+00 | 3.04E+01 | 0.00E+00 | 3.04E+01 |
| End of life  | Disposal                 | C4   | 4.84E-02 | 1.27E-07 | 4.84E-02 | 1.37E+00 | 0.00E+00 | 1.37E+00 |

PERE = Use of renewable primary energy excluding renewable primary energy used as raw materials;  
 PERM = Use of renewable primary energy resources used as raw materials;  
 PERT = Total use of renewable primary energy resources;

PENRE = Use of non-renewable primary energy excluding non-renewable primary energy resources used as raw materials;  
 PENRM = Use of non-renewable primary energy resources used as raw materials;  
 PENRT = Total use of non-renewable primary energy resource

## LCA Results (continued)

| Parameters describing resource use, secondary materials and fuels, use of water |                          |      |          |                           |                           |                |
|---|--------------------------|------|----------|---------------------------|---------------------------|----------------|
|   |                          |      | SM       | RSF                       | NRSF                      | FW             |
|   |                          |      | kg       | MJ<br>net calorific value | MJ<br>net calorific value | m <sup>3</sup> |
| Product stage   | Raw material supply      | A1   | AGG      | AGG                       | AGG                       | AGG            |
|   | Transport                | A2   | AGG      | AGG                       | AGG                       | AGG            |
|   | Manufacturing            | A3   | AGG      | AGG                       | AGG                       | AGG            |
|   | Total (of product stage) | A1-3 | 0.00E+00 | 0.00E+00                  | 0.00E+00                  | 5.81E-01       |
| Construction process stage  | Transport                | A4   | 0.00E+00 | 0.00E+00                  | 0.00E+00                  | 5.95E-04       |
|   | Construction             | A5   | 0.00E+00 | 0.00E+00                  | 0.00E+00                  | 3.44E-02       |
| End of life   | Disposal                 | C4   | 0.00E+00 | 0.00E+00                  | 0.00E+00                  | 1.52E-03       |

SM = Use of secondary material;  
RSF = Use of renewable secondary fuels;

NRSF = Use of non-renewable secondary fuels;  
FW = Net use of fresh water

## Other environmental information describing waste categories

|                            |                          |      | HWD      | NHWD     | RWD      |
|----------------------------|--------------------------|------|----------|----------|----------|
|                            |                          |      | kg       | kg       | kg       |
| Product stage              | Raw material supply      | A1   | AGG      | AGG      | AGG      |
|                            | Transport                | A2   | AGG      | AGG      | AGG      |
|                            | Manufacturing            | A3   | AGG      | AGG      | AGG      |
|                            | Total (of product stage) | A1-3 | 5.01E-01 | 1.76E+00 | 1.23E-03 |
| Construction process stage | Transport                | A4   | 1.15E-03 | 1.28E-01 | 1.89E-05 |
|                            | Construction             | A5   | 1.10E-01 | 2.93E-01 | 9.61E-05 |
| End of life                | Disposal                 | C4   | 1.02E-03 | 5.21E+00 | 8.70E-06 |

HWD = Hazardous waste disposed;  
NHWD = Non-hazardous waste disposed;  
RWD = Radioactive waste disposed



## LCA Results (continued)

| Other environmental information describing output flows – at end of life |                          |      |          |          |          |                       |
|--|--------------------------|------|----------|----------|----------|-----------------------|
|  |                          |      | CRU      | MFR      | MER      | EE                    |
|  |                          |      | kg       | kg       | kg       | MJ per energy carrier |
| Product stage  | Raw material supply      | A1   | AGG      | AGG      | AGG      | AGG                   |
|  | Transport                | A2   | AGG      | AGG      | AGG      | AGG                   |
|  | Manufacturing            | A3   | AGG      | AGG      | AGG      | AGG                   |
|  | Total (of product stage) | A1-3 | 0.00E+00 | 1.34E-01 | 1.08E+00 | 0.00E+00              |
| Construction process stage   | Transport                | A4   | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00              |
|  | Construction             | A5   | 0.00E+00 | 4.43E-01 | 0.00E+00 | 0.00E+00              |
| End of life  | Disposal                 | C4   | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00              |

CRU = Components for reuse;  
MFR = Materials for recycling

MER = Materials for energy recovery;  
EE = Exported Energy

## Scenarios and additional technical information

| Scenarios and additional technical information |  |             |         |
|--|--|-------------|---------|
| Scenario                                       | Parameter  | Units       | Results |
| A4 – Transport to the building site            | Based on a typical delivery trip Daventry to Manchester  |             |         |
|  | Vehicle type: Lorry  | tonnes      | 31      |
|  | Distance:  | km          | 209     |
| A5 – Installation in the building              | This scenario assumes the following energy, ancillary materials and packaging waste are associated with the products installation on site. The scenario assumes no installation wastage of the rooflight as the product is installed on site as a pre-manufactured unit. |             |         |
|  | Sealant tube   | kg per F.U. | 0.1     |
|  | Sealant tape   | kg per F.U. | 0.19    |
|  | Screws   | kg per F.U. | 0.15    |
|  | Electricity for drill battery  | kJ per F.U. | 4.21    |
|  | Diesel for crane   | kg per F.U. | 2.4E-05 |
|  | Transport from supplier to installation site   | km          | 30      |
|  | Diesel for crane   | kg per F.U. | 2.4E-05 |
|  | Wooden pallets waste   | kg per F.U. | 0.44    |
|  | GRP sheet waste  | kg per F.U. | 0.075   |
|  | PC sheet waste   | kg per F.U. | 0.005   |
|  | Polythene wrap waste   | kg per F.U. | 0.126   |
| C1 to C4<br>End of life,                       | Disposal of GRP rooflight  |             |         |
|  | GRP rooflight to landfill (100%)   | Kg per F.U. | 5.2     |

## References

BSI. Sustainability of construction works – Environmental product declarations – Core rules for the product category of construction products. BS EN 15804:2012+A1:2013. London, BSI, 2013.

BSI. Environmental labels and declarations – Type III Environmental declarations – Principles and procedures. BS EN ISO 14025:2010 (exactly identical to ISO 14025:2006). London, BSI, 2010.

BSI. Environmental management – Life cycle assessment – Principles and framework. BS EN ISO 14040:2006. London, BSI, 2006.

BSI. Environmental management – Life cycle assessment – requirements and guidelines. BS EN ISO 14044:2006. London, BSI, 2006.

Harmonised Technical Specification EN 1013:2012 + A1:2014 'Light transmitting single skin profiled plastics sheets for internal and external roofs, walls and ceilings. Requirements and test methods'.