Hambleside Danelaw

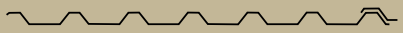
GRP ROOFLIGHT RANGE

Contour **StepSafe** **Insulator**

TRADITIONAL

Hambleside Danelaw — Traditional GRP Rooflights and Cladding

Contour Rooflights and Cladding



Application:
Single skin translucent or opaque profiled sheeting for use in appropriate industrial, agricultural and DIY applications.

Depending upon suitability for application.
Product weights

1.53kg/m²
1.83kg/m²
2.44kg/m²
3.06kg/m²
3.66kg/m²

U-Value
Elemental U-Value in excess of 5W/m²K.

Insulation Methods
None for single skin applications.

Finish:
Translucent GRP: available in Clear, White, Blue or Green tints.
Opaque GRP: available in dark blue, terracotta, dark grey and green with other colours available to meet specification.

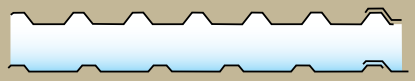
Non-Fragility (Life*)
A roof structure which includes the use of in-plane GRP rooflights is classed as 'non-fragile' when new, providing all of the components used in the assembly have been installed correctly and have passed the test procedures set out in ACR[M]001 : 2011 Fourth Edition, and provided that it has already been demonstrated that the roof system (without rooflights) has an equal or better non-fragility classification.

Single skin Trapezoidal profiles of 3.06kg/m² and above are categorised as Class B non-fragile when new, with a life of 5 to 20 years, at 3.66kg/m² the expected non-fragility period is 25 years.

Single skin Sinusoidal profiles of 2.44kg/m² and above are categorised as Class C non-fragile when new, with a life of 5 to 20 years, at 3.06kg/m² the expected non-fragility period is 25 years.

NOTE: These classifications only apply to single skin applications for use with current reinforced fibre cement sheeting.

Contour Rooflights



Application:
Double skin translucent profiled rooflights for use in retail, warehousing and industrial applications, available in either factory or site assembled formats.

Product weights

SITE ASSEMBLED

Weather Sheet	Liner	Life*
1.83kg/m²	2.44kg/m²	5-20 yrs
2.44kg/m²	1.83kg/m²	5-20 yrs
2.44kg/m²	2.44kg/m²	25 yrs
3.06kg/m²	1.83kg/m²	25 yrs

FACTORY ASSEMBLED

Weather Sheet	Liner	Life*
2.44kg/m²	1.83kg/m²	5-20 yrs
3.06kg/m²	1.83kg/m²	25 yrs

Non-fragility
Life* refers to the expected non-fragility period of the GRP as defined in ACR[M]001 : 2011 Fourth Edition, and provided that it has already been demonstrated that the roof system (without rooflights) has an equal or better non-fragility classification.

Service Life
Contour products have a service life of up to 30 years.

U-Value
Elemental U-Value in excess of 3W/m²K.
Due to their thermal performance uninsulated double skin rooflights cannot comply with the curent UK Building Regulations.

Insulation Methods
None. Traditional double skin application.

Finish:
Translucent GRP: available in Clear, White, Blue or Green tints.

Contour INSULATED Rooflights

Application:
Triple skin translucent profiled rooflights for use in retail, warehousing and industrial applications, available in either factory or site assembled formats.

Product weights

SITE ASSEMBLED

Weather Sheet	Liner	Life*
1.83kg/m²	2.44kg/m²	5-20 yrs
2.44kg/m²	1.83kg/m²	5-20 yrs
2.44kg/m²	2.44kg/m²	25 yrs
3.06kg/m²	1.83kg/m²	25 yrs

FACTORY ASSEMBLED

Weather Sheet	Liner	Life*
2.44kg/m²	1.83kg/m²	5-20 yrs
3.06kg/m²	1.83kg/m²	25 yrs

Non-fragility
Life* refers to the expected non-fragility period of the GRP as defined in ACR[M]001 : 2011 Fourth Edition, and provided that it has already been demonstrated that the roof system (without rooflights) has an equal or better non-fragility classification.

Service Life
Contour products have a service life of up to 30 years.

U-Value
Elemental U-Value of 1.7W/m²K or better.

Insulation Methods
Twin-Wall 4mm Polycarbonate
10mm Polycarbonate
Cellulose acetate honeycomb core available in depths of **20mm, 40mm and 80mm.**

Finish:
Translucent GRP: available in Clear, White, Blue or Green tints.

ECO-FRIENDLY

Hambleside Danelaw Eco-Friendly Insulated GRP Rooflights

StepSafe

High performance, low carbon rooflights

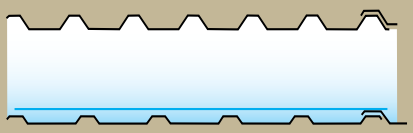
StepSafe products (SS) are manufactured from high grade glass reinforced materials which reduce the amount of resin required in their production, considerably improving their strength. Because the manufacturing process requires less resin, the result is that the embodied carbon element is reduced.

Insulator

Our unique patented transparent honeycomb core is manufactured in the UK from cellulose acetate, a sustainable material. We have developed the insulator range to provide the most energy efficient insulating rooflight assembly in our marketplace.

An important advantage of the insulator range is that it provides a very even and enhanced spread of natural light within the building, reducing the need for artificial lighting and saving on energy costs.

StepSafe LOW CARBON Eco-Rooflights



Application:
Insulated translucent profiled rooflights for use in retail, warehousing and industrial applications, available in either factory or site assembled formats.

Product weights

SITE ASSEMBLED

Weather Sheet	Liner	Life*
1.83kg/m²	2.40kg/m² (SS)	25yrs
2.40kg/m² (SS)	2.40kg/m² (SS)	25yrs
3.00kg/m² (SS)	1.83kg/m²	25yrs

FACTORY ASSEMBLED

Weather Sheet	Liner	Life*
1.83kg/m²	2.40kg/m² (SS)	25yrs
2.40kg/m² (SS)	2.40kg/m² (SS)	25yrs
3.00kg/m² (SS)	1.83kg/m²	25yrs

Non-fragility
Life* refers to the expected non-fragility period of the GRP as defined in ACR[M]001 : 2011 Fourth Edition, and provided that it has already been demonstrated that the roof system (without rooflights) has an equal or better non-fragility classification.

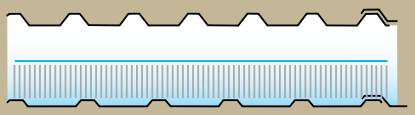
Service Life
StepSafe products have a service life of up to 40 years.

U-Value
Elemental U-Value from 0.8W/m²K to 1.7W/m²K depending upon core specification

Insulation Methods
Twin-Wall 4mm Polycarbonate.
10mm Polycarbonate
Cellulose acetate honeycomb core available in depths of **20mm, 40mm and 80mm.**

Finish:
Translucent GRP: available in Clear, White, Blue or Green tints.

Insulator THERMAL Eco-Rooflights



Application:
Insulated translucent profiled rooflights for use in retail, warehousing and industrial applications, available in either factory or site assembled formats.

Product weights

SITE ASSEMBLED

Weather Sheet	Liner	Life*
1.83kg/m²	2.40kg/m² (SS)	25yrs
2.40kg/m² (SS)	2.40kg/m² (SS)	25yrs
3.00kg/m² (SS)	1.83kg/m²	25yrs

FACTORY ASSEMBLED

Weather Sheet	Liner	Life*
1.83kg/m²	2.40kg/m² (SS)	25yrs
2.40kg/m² (SS)	2.40kg/m² (SS)	25yrs
3.00kg/m² (SS)	1.83kg/m²	25yrs

Product weights

SITE ASSEMBLED

Weather Sheet	Liner	Life*
1.83kg/m²	2.44kg/m²	5-20yrs
2.44kg/m²	1.83kg/m²	5-20yrs
2.44kg/m²	2.44kg/m²	25yrs
3.06kg/m²	1.83kg/m²	25yrs

FACTORY ASSEMBLED

Weather Sheet	Liner	Life*
2.44kg/m²	1.83kg/m²	5-20yrs
3.06kg/m²	1.83kg/m²	25yrs

Non-fragility
Life* refers to the expected non-fragility period of the GRP as defined in ACR[M]001 : 2011 Fourth Edition, and provided that it has already been demonstrated that the roof system (without rooflights) has an equal or better non-fragility classification.

Service Life
StepSafe products have a service life of up to 40 years.

U-Value
Elemental U-Value from 0.8W/m²K to 1.4W/m²K depending upon core specification.

Insulation Methods
Cellulose acetate honeycomb core available in depths of **20mm, 40mm and 80mm.**

Finish:
Translucent GRP: available in Clear, White, Blue or Green tints.

Lo-Carbon GRP

Lo-Carbon GRP

CARBON ZONE

Hambleside Danelaw's low impact environmental credentials

Embodied Energy & Carbon
Embodied energy is the total primary energy consumed during the life time of a product. Ideally the calculation should include data from the extraction of the prime raw materials including associated production costs to the end of the products service life - this is referred to as 'Cradle to Grave'. Hambleside Danelaw working in conjunction with dcarbon8 calculated the embodied carbon weights on a square metre basis for its GRP products.

Recycling GRP
Hambleside Danelaw have also worked with a number of independant and academic organisations to develop a processing system to enable us to recycle GRP.

Contour

Single Skin Weather Sheet		Life* in years	$C0_2e$ kg/m² embodied	$C0_2e$ kg/m² per annum
1.53kg/m²		Fragile	7.92	n/a
1.83kg/m²		Fragile	9.47	n/a
2.44kg/m²	Rigid Sinusoidal only	5 to 20	12.58	0.63
3.06kg/m²		5 to 20	15.69	0.78
3.66kg/m²		25	18.80	0.75

Contour

Rooflight Assemblies		Insulating Material	Life* in years	$C0_2e$ kg/m² embodied	$C0_2e$ kg/m² per annum
Weather Sheet	Liner				
1.83kg/m²	2.44kg/m²	None	5 to 20	23.29	1.16
1.83kg/m²	2.44kg/m²	Polycarbonate 4mm	5 to 20	28.09	1.40
2.44kg/m²	1.83kg/m²	None	5 to 20	22.99	1.15
2.44kg/m²	1.83kg/m²	Polycarbonate 4mm	5 to 20	27.79	1.39
2.44kg/m²	2.44kg/m²	None	25	26.44	1.06
2.44kg/m²	2.44kg/m²	Polycarbonate 4mm	25	31.24	1.25
3.06kg/m²	1.83kg/m²	None	25	26.14	1.05
3.06kg/m²	1.83kg/m²	Polycarbonate 4mm	25	30.94	1.24

Lo-Carbon StepSafe

Rooflight Assemblies		Insulating Material	Life* in years	$C0_2e$ kg/m² embodied	$C0_2e$ kg/m² per annum
Weather Sheet	Liner				
1.83kg/m²	2.40kg/m² (SS)	None	25	21.67	0.62
1.83kg/m²	2.40kg/m² (SS)	Polycarbonate 4mm	25	26.47	0.76
2.40kg/m² (SS)	2.40kg/m² (SS)	None	25	23.00	0.58
2.40kg/m² (SS)	2.40kg/m² (SS)	Polycarbonate 4mm	25	27.80	0.70
3.00kg/m² (SS)	1.83kg/m²	None	25	25.40	0.73
3.00kg/m² (SS)	1.83kg/m²	Polycarbonate 4mm	25	30.20	0.86

Lo-Carbon Insulator

Rooflight Assemblies		Insulating Material	Life* in years	$C0_2e$ kg/m² embodied	$C0_2e$ kg/m² per annum
Weather Sheet	Liner				
1.83kg/m²	2.40kg/m² (SS)	Honeycomb 40mm	25	28.01	0.80
1.83kg/m²	2.40kg/m² (SS)	Honeycomb 80mm	25	21.71	0.62
2.40kg/m² (SS)	1.83kg/m²	Honeycomb 40mm	25	28.01	0.93
2.40kg/m² (SS)	1.83kg/m²	Honeycomb 80mm	25	21.71	0.72
2.40kg/m² (SS)	2.40kg/m² (SS)	Honeycomb 40mm	25	29.58	0.74
2.40kg/m² (SS)	2.40kg/m² (SS)	Honeycomb 80mm	25	23.28	0.58
3.00kg/m² (SS)	1.83kg/m²	Honeycomb 40mm	25	32.04	0.92
3.00kg/m² (SS)	1.83kg/m²	Honeycomb 80mm	25	25.74	0.74

Sustainability

GRP is recyclable at end of service life. Polycarbonate is recycled at end of service life. The cellulose acetate honeycomb assembly may be recycled or composted at end of service life.

* Life refers to the expected non-fragility period as defined in ACR[M]001 : 2011 Fourth Edition.

The Insulator Core

Hambleside first developed the patented Insulator Rooflight System in 2001. The heart of the system is the transparent honeycomb insulant core which is simply incorporated within the GRP rooflight assembly. Combining of the traditional rooflight with this innovative insulation solution to insulation, took the market by surprise. U-values, which traditionally were in excess of 3.3 for GRP rooflights, can now be dramatically reduced to as low as 0.8W/m²K. This is achieved with no impact on normal installation methods and no change to the fasteners.

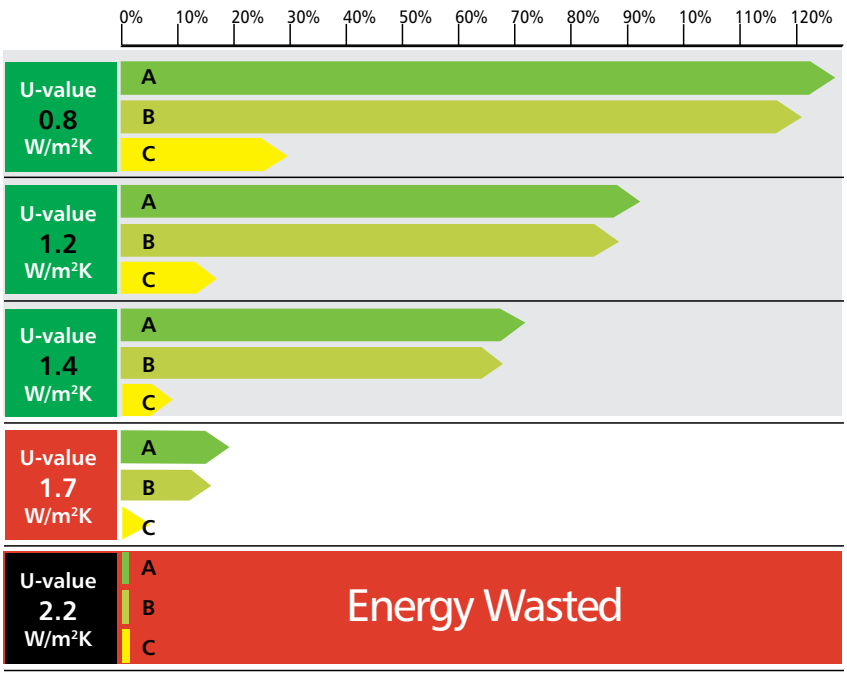
The chart overleaf shows the levels of energy savings that can be achieved through incorporating the different thicknesses of honeycomb core into the rooflight assemblies.

Lighting & $C0_2$

The Insulator honeycomb core provides and excellent method of reducing carbon emissions without significantly decreasing light transmission or increasing solar heat energy transmission.

The carbon savings that can be achieved by maximising the use of the available natural daylight combined with automated artificial lighting controls far outweighs any heat loss savings achieved by reducing rooflight areas and this should be taken into consideration by the designer when modelling the building.

Additional benefits obtained through using a more efficient insulation medium when compared to the Regulatory minimum performance



A **$TeCO_2$**

Based on the grid electric, this value represents the approximate increase in $TeCO_2$ savings expressed in percentage terms, which can be achieved through enhancing the insulant layer within a rooflight.

B **Potential Annual Energy Savings**

Based on the grid electric, this value represents the approximate increase in annual energy cost savings, in percentage terms, which are over and above those which would be achieved by using a product which only complies to the Regulatory minimum performance. It should be remembered that these savings will accumulate year-on-year throughout the service life of the product.

C **Extra initial investment required to generate annual savings (depicted in A and B)**

Increased insulation performance does initially add to the build cost. This value, in percentage terms, expresses the likely cost differential between Insulator rooflights, with their improved U-value performance and the Regulatory minimum product. The additional investment in the build cost has a relatively short pay back period.

This chart is an approximate guide and actual savings and costs will vary according to supply and the performance of the building envelope.

Quality - Environment - Safety - Technical

Management Standards:

Hambleside Danelaw is accredited with BS EN ISO 9001:2008 for quality, BS EN ISO 14001:2004 for environment and BS OHSAS 18001:2007 for safety, which exceed the mandatory requirements for BES 6001.

Weather Surface:

All Hambleside Danelaw weather sheets are protected by a protective film which is specifically designed to provide high levels of UV resistance making them suitable for use in a northern European environment.

Chemical, Atmospheric and Biological Effects:

1. GRP has no known chemical reaction with other materials commonly used in the construction industry.

2. Certain acids, alkalis and solutions of water soluable gases may attack GRP.

3. GRP is resistant to attack by micro organisms, fungi, larvae, insects and mildew.

4. Water Absorption <3% after 24hrs @ 20°C.

5. Thermal Movement:
Contour: Coefficient of linear expansion = $22 \times 10^{-6} K^{-1}$.
StepSafe (SS): Coefficient of linear expansion = $18 \times 10^{-6} K^{-1}$.

6. Operating Temperature: from -20°C to 80°C. Some discolouration may occur above 65°C.

Mechanical and Structural Values

		Contour 1.83kg/m²	**StepSafe** 3.00kg/m²
Flexural Strength	N/mm²	180	366
Flexural Modulus	kN/mm²	4	9.88
Tensile Strength	N/mm²	80	152.8
Nominal Thickness	mm	1	2
Barcol Hardness		50	55.5
Light Transmission		83%	60%

Fire Rating:

GP - General Purpose where application permits.
SAB 3 - For single skin rooflight applications where each rooflight does **not** exceed 5m² and where the distance between the rooflights is not less than 3 metres.
SAA 1 - For single skin rooflight applications where each rooflight **does** exceed 5m².
SAA 0 - For single skin rooflight applications where each rooflight **does** exceed 5m².

Fire Rating: Site & Factory Assembled Rooflight configurations

SAB 3 - For Weather Sheet.
SAA 1 - For Liner Panel.
SAA 0 - For Liner Panel where specification requires.

BBA APPROVAL INSPECTION TESTING CERTIFICATION
CERTIFICATE No 03/3996

BSI
EMS 500154
FM 23063
OHS 532271

Hambleside Danelaw

Hambleside Danelaw Limited

Long March
Daventry
Northamptonshire
NN11 4NR

Main switchboard: 01327 701900
General fax: 01327 701909

www.hambleside-danelaw.co.uk
e-mail: marketing@hambleside-danelaw.co.uk

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