



# **TECHNICAL MANUAL**

Embodied Carbon



LOW CARBON DAYLIGHT SOLUTIONS

# Embodied carbon

Hambleside Danelaw have a very strong reputation for award winning products with a high environmental performance. Our rooflights have been at the forefront of industry performance since 2001 and have won a Queens Award for Innovation. Our unique Zenon Insulator honeycomb core for instance is made from sustainable resources and is compostable at end of life. Whenever we quote figures for embodied carbon they are cradle-to-grave, or cradle-to-cradle wherever possible, so that you get the full picture. All our embodied data has been independently verified by Dcarbon8 and RPS Group.



## EMBODIED CARBON

The carbon released during the resource extraction, manufacture and fabrication of a product, its use, maintenance and final disposal including transport and packaging at all stages.

### Cradle-to-Grave

Cradle-to-grave is the full Life Cycle Assessment from resource extraction 'cradle' - through processing, manufacturing and use to final disposal phase - 'grave'.

This includes all packaging, transport and maintenance. Hambleside Danelaw quoted figures also make an

allowance for transporting the rooflights to site, their maintenance in line with recommendations and the disposal of the rooflights after the building is demolished.

Transport emissions can make a big difference to the embodied carbon especially when goods are moved across the globe.

Our Zenon Insulator cellulose acetate honeycomb core is extracted from tree fibres and is processed into a film which we make into honeycomb. At end of life it can be composted. This results in a very low embodied carbon figure of 0.28kg of embodied carbon per square metre of our 20mm thick insulation compared to the comparable thermal performance of 10mm thick, four-wall polycarbonate with 18 times the amount at 5.1kg.

Our Zenon Evolution factory assembled rooflights (FAIRS) have only 40% of the cradle-to-grave embodied carbon of a traditional rooflight with the same performance over the lifetime of a standard building.





### Cradle-to-Gate

Cradle-to-gate is an assessment of a partial product life cycle from resource extraction (cradle) to the factory gate i.e., before it is transported to the consumer. The use phase and disposal phase of the product are omitted in this case. Cradle-to-gate assessments can be misleading especially if the product is used with other products to make them actually work. For example reinforced cement using a cradle-to-gate assessment would only consider the cement. The reinforcement would not be included but will make a considerable difference to the final cradle-to-grave assessment.

### Cradle-to-Cradle or 'Closed Loop' Production

Cradle-to-cradle is a specific kind of cradle-to-grave assessment, where the end-of-life disposal step for the product is a recycling or reuse process. Products that are cradle-to-cradle are the aim of sustainable production; for example glass bottles that are melted down at end of life to make more glass bottles.

### Recycling

Recycling is a process to change end of life materials into new products to prevent waste, reduce the consumption of new raw materials, reduce energy use, reduce pollution and therefore reduce greenhouse gas emissions.



We have been working on the recycling of GRP for the last ten years and have developed a process to break down the GRP resin whilst still retaining fibre length, so that the glass fibres can be used as reinforcement in thermoplastics where they can also be recycled at end of life.

### Quality, Production & Manufacturing Controls

When it comes to the environment, quality, production & manufacturing controls are important because through a good quality system, it is possible to prevent waste, reduce the consumption of new raw materials, reduce energy use, reduce pollution and therefore reduce greenhouse gas emissions.

Hambleside Danelaw products are factory made to BS EN ISO 9001 quality management standards. By providing good quality, consistent products to high standards, less waste is created.



Zenon, a comprehensive range of low carbon rooflights for the metal building envelope from Hambleside Danelaw

**Hambleside Danelaw**  
Rooflights



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