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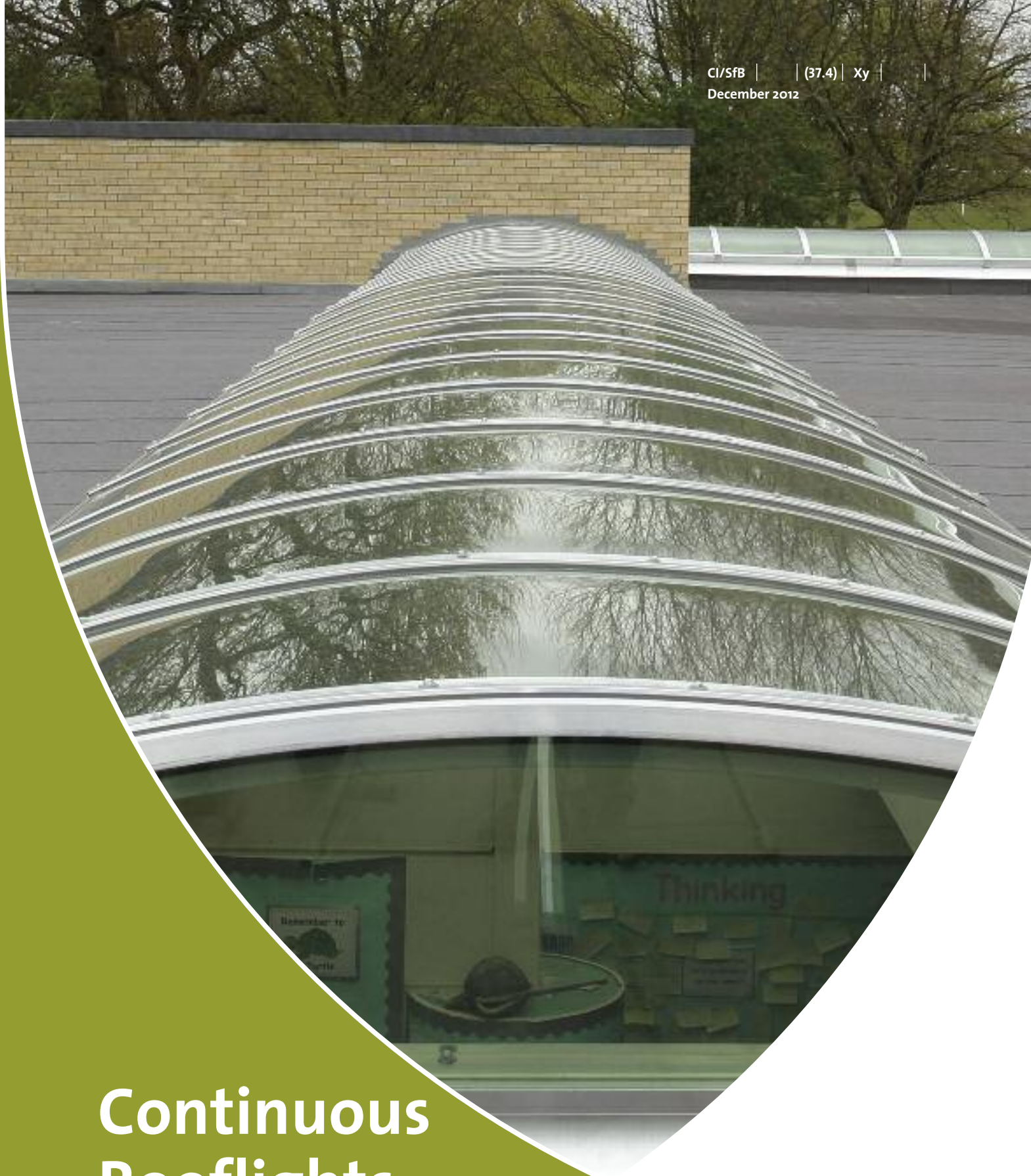


Continuous Rooflights

in polycarbonate and glass

Whitesales®
Rooflights & more...

Whitesales®
Rooflights & more...

Company profile

Whitesales has over 20 years' experience in the manufacture and distribution of speciality flat roofing products. As a company we have the dedication and resource to fulfil the most demanding of requirements throughout the UK.
Our experienced and expert personnel have an in-depth knowledge of industry regulations, which ensures we provide up to date advice on fully compliant solutions. Also, we invest in ecologically friendly business processes meaning that our products are from sustainable sources.

Rooflights and more...

Whether you are a specifier, contractor or merchant, you will benefit from working with us. The following are just some of the reasons why you should choose Whitesales.

High quality products

Our speciality roofing products and accessories are tested to the highest standards and are suitable for use with most flat roof systems, including single ply, felt, hot-melt, asphalt, liquid, GRP and lead. Our tubular rooflights are ideal for use on pitched or flat roofs.

Nationwide coverage and next day delivery

With depots strategically located in England and Scotland, Whitesales offers nationwide next day delivery on our own transport or overnight carrier service. Deliveries can be direct to site or to contractor or merchant premises.

Technical advice and support

The Whitesales Customer Service Team is readily available to assist you, from your initial enquiry through to after sales support. This includes help with specification writing, site surveys, condition reports, budget costings and fully detailed quotations.

Guarantees

All products supplied are fully guaranteed including insurance backed guarantee on request.

Contents

ISO 9001 Registered Firm
Certificate No. GB2003875
International Accreditation Board
Registration No. 0044/1

> Whitesales is **renowned for proven product ranges** and industry leading levels of service and expertise.

Why is natural daylight so important?

Natural daylight has long been recognised as the most effective form of light. Building Regulation Approved Document L requires designers to provide adequate daylight '...where rooflight areas are reduced below 20%, the building designer must take special care to demonstrate daylight levels remain adequate...'

Flat roof rooflights are the most efficient means of providing natural daylight, providing up to three times more daylight than an equally-sized vertical window. The light from a rooflight is also more evenly distributed throughout the room, less likely to result in glare or compromise of privacy.

Natural daylight is an invaluable natural asset. The benefits of a naturally-lit workspace are well documented and include increased productivity, work satisfaction and cost reduction, as well as significant reduction of impact to the environment. From a building design perspective the use of rooflights is an excellent means by which both light and solar energy can be utilised to save energy and to reduce the carbon footprint of any property.

There are specific industry policies and guide documents to assist with introducing naturally-lit space into different building types (especially schools). Whitesales can offer support and advice on the requirements for specific applications.

Product overview: The 'Whitesales' roof

Em-Dome

Thermoformed dome and pyramid shape rooflights. Em-Domes are offered in a wide range of sizes and glazing options.
See our dedicated brochure 'Modular rooflights'.

Em-Glaze Modular

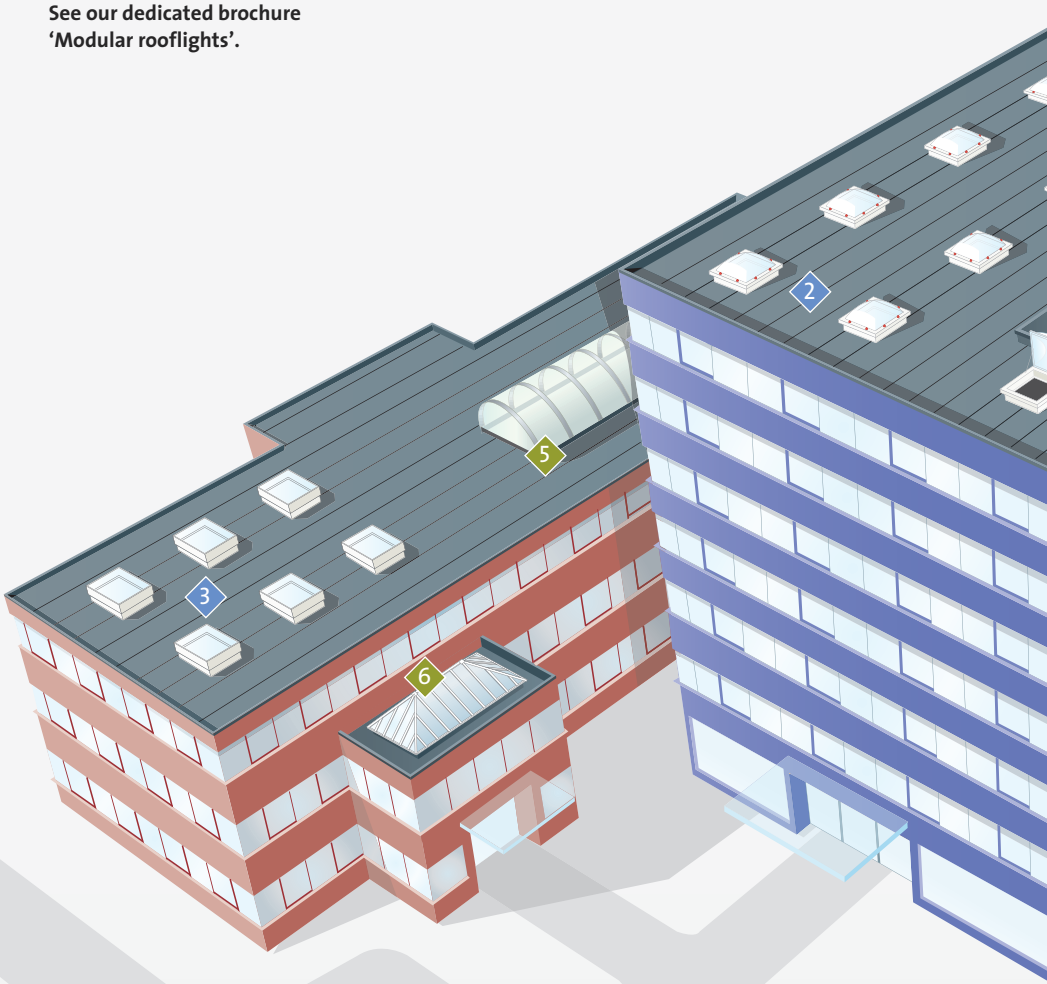
Flat glass rooflights with polyester powder coated aluminium frame. Em-Glaze Modular units are available from stock with other bespoke sizes available to order.
See our dedicated brochure 'Modular rooflights'.

Em-Tube

Tubular skylights for flat or pitched roofs with either a rigid or flexible internal tube. Em-Tubes are available from stock in a range of sizes and accessory options.
See our dedicated brochure 'Modular rooflights'.

Em-Vent

Smoke ventilators incorporating either glazed or solid covers. Em-Vents are available in sizes designed to meet current regulations and to suit site dimensions. Em-Hatch Access Hatches also available.
See our dedicated brochure 'Smoke ventilation and access hatches'.



Whether you require design recommendations or have a project on site, Whitesales has the experience, product and service to meet that need.

Em-Vault

Barrel vaulted continuous sectional rooflights in polycarbonate. Em-Vaults are ideally suited to covering large areas and are made to measure. T-Vault GRP barrel vaults are also available as a functional alternative.
See pages 6-15 for Em-Vault.
See pages 16-23 for T-Vault.

Em-Glaze Monopitch

Continuous monopitch skylights in glass or polycarbonate with aluminium framework and cill sections. The Em-Glaze range also includes Ridgelight, Pyramid and Lantern varieties.
See pages 24-33.

Em-Trim

GRP roof edge trim. Em-Trim is available in a wide range of sizes and colours. T-Trim aluminium roof edge trim is also available along with Em-Bar and T-Bar termination bar.
See our dedicated brochure 'Roof trims and other accessories'.

Em-Pad

Adjustable paving slab support pad. Em-Pads are adjustable height to allow accurate levelling of paving systems. T-Pad fixed unit is also available. The Accessories range also includes T-Vent breather vents, T-Sleeve pipe sleeves and T-Pipe drainage outlets.
See our dedicated brochure 'Roof trims and other accessories'.

Em-Vaults

High quality continuous barrel vault rooflights designed to make optimum use of natural light. Em-Vaults are purpose made and are offered in a range of profiles and glazing options to meet virtually any specifier and client requirement.

Em-Vault in opal diffused with Multiwall glazing

Em-Vault in opal diffused with Multiwall glazing

Description

Em-Vaults are high quality continuous rooflights used to span openings up to 6m wide and unlimited length. Units consist of polycarbonate glazing and extruded aluminium cill sections, pre-formed curved glazing bars and capping profiles and are available with solid single, double or triple, or multiwall glazing.

Em-Vaults use polycarbonate glazing and may be independently tested and certified according to EN 14963: 2006: 1200 Joules, and ACR(M): 001: 2005 Class B and be deemed Non-Fragile in accordance with (HSE) Health and Safety in Roofworks. Em-Vaults are tested to the highest standards and are proven suitable for use on most flat roofs, including single ply, felt, hot-melt, asphalt, liquid, GRP and lead.

Em-Vaults are normally specified to fit to a site formed builder's curb, although subject to loading calculations, can be supplied with the Em-Curb PVCu range of upstands (see page 10).

Opening and ventilation options are available (see page 13).

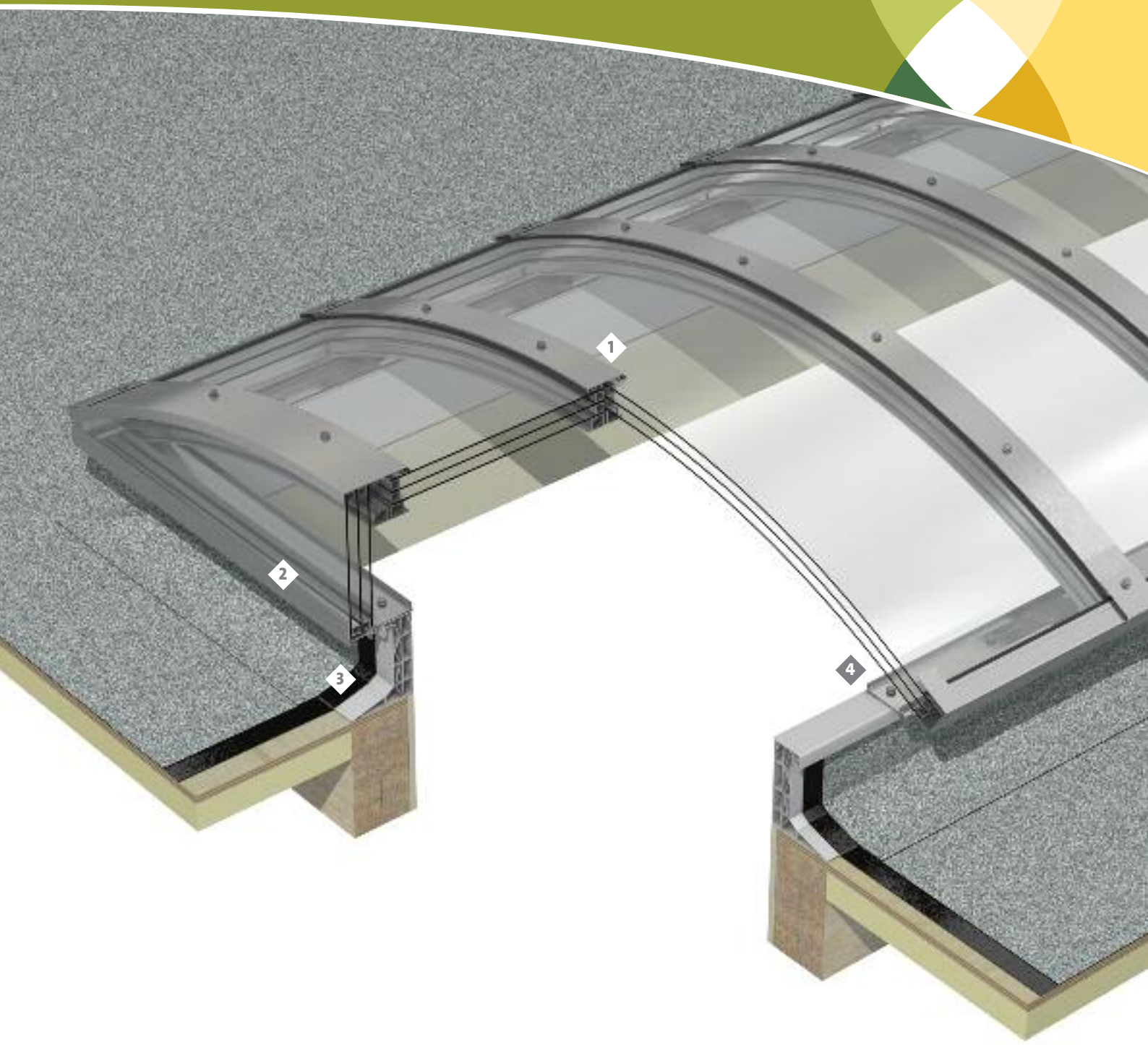
Certification

Whitesales' Em-Vaults are 'out-of plane' rooflights.

- Where 'Non-Fragile' Em-Vault polycarbonate rooflights have undergone large body impact testing by an independent accredited test organisation. Test certificates are available to demonstrate compliance to an energy level of 1200 Joules when tested to EN 14963:2006, and ACR(M)001: 2005 to Class B.
- Polycarbonate Em-Vaults are manufactured in accordance with European standards.
- Em-Curb upstands and rotating ventilators are certified as providing adequate resistance to precipitation, according to EN 1873 – Weathertightness.

Em-Vault key features

1. Polycarbonate glazing
2. Glazed or solid vertical end panel
3. PVC-u upstand curb
4. Perimeter cill section



Em-Vault glazing options

Features

- ‘Non-fragile’ version available, tested to 1200J
- Solid, single, double, triple skin or multiwall
- Spans up to 6.0m and unlimited length
- Suited to new buildings and refurb applications
- High light efficiency giving excellent light distribution
- Available in low rise (1/6) and high rise (1/2)
- Building Regulation ADL compliant options

Em-Vault in opal diffused with Multiwall glazing

Glazing

Em-Vaults are constructed from polycarbonate sheet and are available in single, double and triple skin solid polycarbonate and in multiwall construction. Polycarbonate is virtually unbreakable, with an impact strength up to 250 times greater than glass. Aerogel is a multiwall polycarbonate filled with translucent aerogel granules, giving an even spread of diffused light and excellent thermal properties.

Single skin | Double skin | Triple skin

Multiwall 16mm | Aerogel 16mm

Em-Vaults can be supplied in clear, opal diffused, bronze or ‘HeatReflect’ (reflects up to 68% of the heat radiation) glazing.

Clear | Opal diffused | Bronze | ‘HeatReflect’

All solid polycarbonate Em-Vaults have a minimum 3 mm thick outer glazing. Inner skin thickness may vary.

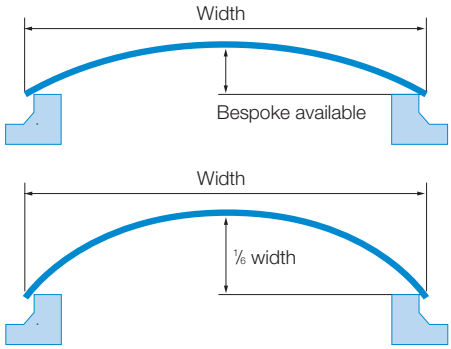
Size

Em-Vaults are purpose-made and available in widths from 0.6m (Multiwall 1.5m) to 6.0m and in unlimited length.

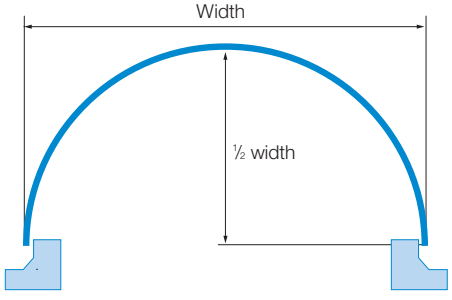
Profiles

The standard profile is a rise 1/6 of the width although a higher rise and bespoke profiles are also available on certain sizes.

Low rise profiles



High rise profile



Em-Vault in clear with solid glazing

Vertical and horizontal forces

Vertical force

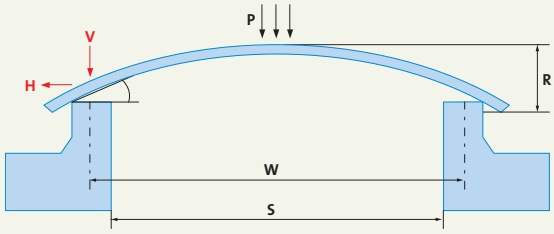
$V = \frac{P \times S}{2}$ where:

V = vertical force per metre (N/m)
P = snowload + deadweight (N/m²)
S = clear span (m)

Horizontal force

$H = \frac{P \times W^2}{8R}$ where:

H = horizontal force per metre (N/m)
P = snowload + deadweight (N/m²)
W = barrel width (fixing centres) (m)
R = barrel rise (m)



Performance of glazing materials

Typical values	Polycarbonate
Fire ratings	
To BS 476: Part 3	AA
To BS 476: Part 7	Class 1*
To 1991 Building Regulations	Tp(a)
Service temperature	-50 to +120°C

Information for 3mm thick glazing unless noted otherwise.

* Class 0 for Building Regulation purposes

Frame structure

The structural frame is assembled from extruded aluminium sections. Units with solid glazing are constructed with factory assembled cassettes. For multiwall glazed units, the glazing is held between pre-formed curved glazing bars and capping profiles, securing all four sides of the glazing and accommodating thermal movement.

End panels are fully glazed, and for wider installations incorporate vertical glazing bar(s).

The aluminium sections are supplied with a mill finish as standard. They can also be supplied with a polyester powder coating to any RAL or BS colour number and finish.

Glazing specification

	Single Clear	Single Opal	Single HeatReflect	Double Clear	Double Opal	Double HeatReflect
Light transmission (LT %)	88%	58%	56%	77%	51%	49%
Solar heat gain factor (g %)	83%	60%	46%	69%	50%	38%
Thermal transmission (W/m²K)	5.36	5.36	5.36	2.95	2.95	2.95

	Triple Clear	Triple Opal	Triple HeatReflect	Multiwall 16 Clear	Multiwall 16 Opal	Aerogel 16
Light transmission (LT %)	70%	45%	43%	59%	49%	63%
Solar heat gain factor (g %)	60%	43%	32%	57%	50%	65%
Thermal transmission (W/m²K)	2.03	2.03	2.03	1.82	1.82	1.4

Em-Vault curbs

Features

- Used in conjunction with Em-Vault rooflights
- Exceptional thermal efficiency
- Em-Curbs for new installations
- Enhance overall appearance of the rooflight
- Prefinished white internally
- Heights available 150, 300 and 350mm
- Constructed in PVC-u

Em-Vault triple glazed solid in HeatReflect finish

Em-Vaults are normally specified to fit to a site-formed builder's curb, although, subject to loading calculations, can be supplied with the Em-Curb PVCu range of upstands.

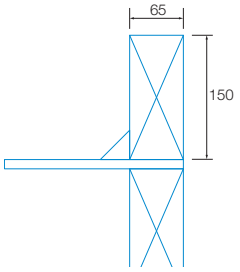
Em-Curb upstands

Em-Curbs are designed to be used in conjunction with Em-Vault rooflights to provide a thermally broken interface which in turn helps to improve the overall thermal efficiency of the roof. Em-Curbs represent excellent value for money, enhance the overall appearance of the rooflight and are prefinished white internally, therefore requiring no further decoration.

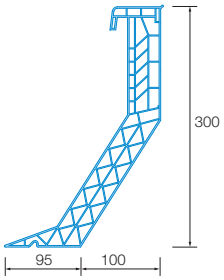
Splayed Em-Curb upstands give an excellent spread of light through the room whilst the vertical units are available where the dimensions of the roof aperture need to be maintained.

The standard Em-Curb is made from extruded white PVC-u. The multi-chambered construction gives an exceptionally robust and thermally efficient performance. This curb is suitable for most roof finishes and is available in heights of 150, 300 and 350mm with other heights also available. All ventilation options can be used in conjunction with Em-Curbs.

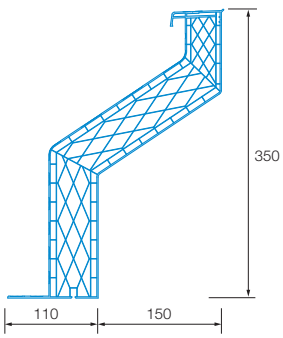
For wide and multiwall Em-Vault units, we would recommend that a builder's upstand is formed, rather than a proprietary PVC curb.



Builder's curb



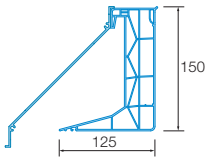
Em-Curb PVC-u 300/s



Em-Curb PVC-u 350/s

Em-Collar adaptors

Em-Collars provide a thermally broken solution for replacing existing rooflights and would typically be installed to an existing builder's upstand. Consideration should be given to using the PVC 350/s upstand to oversleeve existing site upstand as this reduces site work, especially where existing linings must not be disturbed, e.g. may contain asbestos.



Em-Collar PVC-u 150/v

Case study	Leisure Centre
Project type	Refurbishment
Product	Em-Vault
Glazing	Multiwall, opal diffused
Upstand	Existing

Em-Vault ventilation options

Case study	Vehicle workshop
Project type	Refurbishment
Product	Em-Vault
Glazing	Solid, clear
Upstand	Existing metal

Features

- Permanent Trickle
- Controllable Trickle
- Controllable Rotating
- Hinged Electric Actuator Opening
- Hinged Manual Spindle Opening
- Powered Extract Fan
- Electric hit and miss

Em-Vault in solid with manual opening sections

Ventilation options

All Em-Vaults have fixed glazing as standard. Options listed above can be incorporated in most permutations of Em-Vault installations.

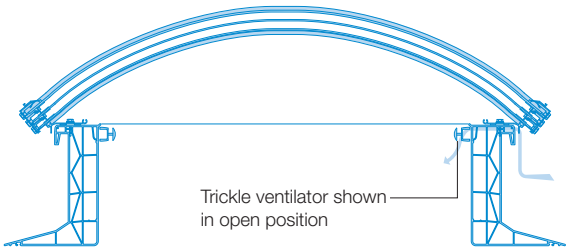
The Permanent Trickle option provides a permanent background vent by means of a fixing spacer.

Hinged manual spindle opening allows rapid air movement whilst being an economical option.

Powered extract fans can be incorporated in the vertical end panels, depending on the available height.

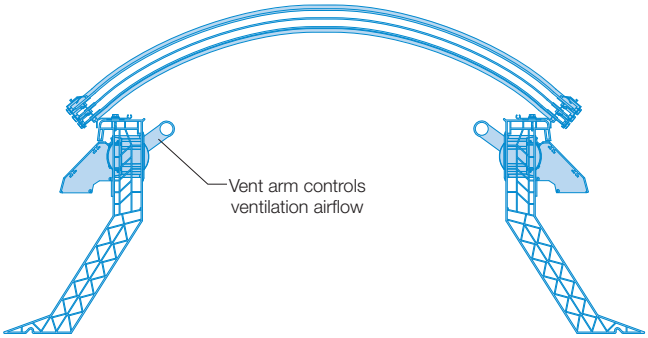
Controllable Trickle

Controllable trickle ventilation is a slot vent which is fitted to two or four sides of a PVC Em-Curb or Em-Collar. With the vents on two sides the unit will provide a minimum of 8000mm² ventilation area which assists with Building Regulation compliance.



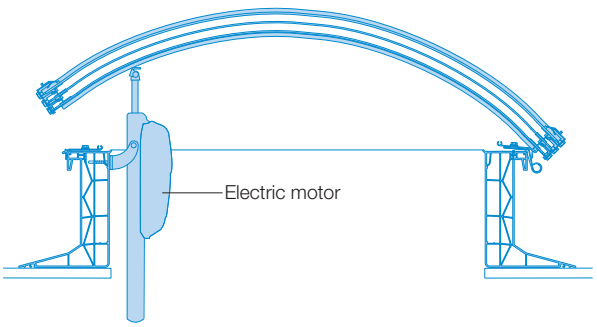
Controllable Rotating

Controllable rotating vents are a fully insulated unit with enhanced thermal properties and a greater vent area than the Trickle Vent options. The vents can be fitted to two or four sides of a PVC Em-Curb or Em-Collar. All units are supplied with external weathering cowls. Tested and certified according to EN 1873 Watertightness.



Hinged Electric Spindle Opening

Hinged opening sections provide the maximum ventilation area to allow rapid air movement. The electric actuator operation allows control by a wall mounted open/close switch and also options for wind, rain and temperature sensors with a range of control panels available separately. Actuators are either 24V DC or 230V AC and open to 400mm.



Em-Vault installation & operation

Em-Vault with solid glazing in clear

Em-Vault with Multiwall glazing in opal diffused

Whitesales rooflights and accessories can generally be regarded as 'maintenance free'. However, the following guidelines should be followed to optimize their usefulness. Any maintenance of rooflights must of course be carried out strictly in accordance with the relevant 'Health and Safety' regulations.

Em-Vault

Operation

Em-Vaults are fixed at installation stage to the relevant upstand, and are a means of allowing natural light into the area below.

Polycarbonate rooflights are available as 'Non-Fragile', but should not be trafficked.

Maintenance

Wash only with warm soapy water. DO NOT USE strong detergents or abrasives.

Physically check Barrel Vaults annually to ensure fixings are secure.

Em-Curb

Operation

Normally manufactured in Extruded PVCu.

Em-Curbs provide a proprietary upstand detail for Em-Vaults.

Maintenance

Maintenance free.

Passive ventilation

Operation

Normally by means of 'Trickle', 'Louvre' or 'Rotating' vents, to provide background ventilation. Trickle vents are adjusted by hand. Louvre and Rotating vents are adjusted by a proprietary operating rod – available in 1.5, 2, 3 or 4m lengths.

Maintenance

Maintenance free.

Opening ventilation

Operation

Operated electrically by means of 24V DC or 240V AC electric actuators. Electric actuators must be installed by a qualified electrician.

Maintenance

Test annually by an Approved Electrical Installations Testing Company. Physically check fixing brackets to ensure fixings are secure.

Extract Fans

Operation

These are fitted to the relevant rooflight component and connected to an unswitched Fused-Spur.

A switched electrical supply should be connected by a qualified electrician.

Maintenance

Test annually by an Approved Electrical Installations Testing Company.

Case study	Riding School
Project type	New Build
Product	Em-Vault
Glazing	Multiwall in opal diffused
Upstand	Site formed

T-Vaults

Economical barrel vault rooflights designed to provide a functional solution for covering larger areas. T-Vaults are purpose made to suit either new or refurbishment applications and are available with a range of glazing and ventilation options.

T-Vault in opal diffused

T-Vault in opal diffused

Description

T-Vaults are high performance continuous rooflights suitable for spans up to 4m and unlimited length. They are constructed from a series of interlocking curved and profiled GRP panels. The GRP panels have a high light transmittance and an outer protective Melinex® film providing guaranteed protection against UV degradation.

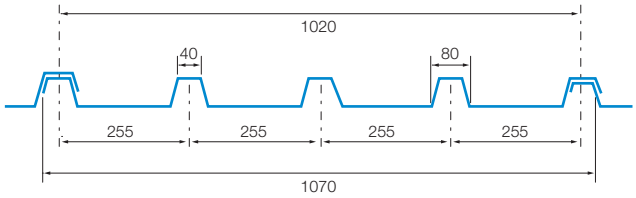
T-Vaults use a Glass reinforced Polyester (GRP) glazing and have been tested and certified according to EN 14963: 2006 – Non-Fragile and ACR(M): 001: 2005 Class B. T-Vaults are tested to the highest standards and are proven suitable for use on most flat roofs, including single ply, felt, hot-melt, asphalt, liquid, GRP and lead. They are normally specified with our proprietary curbs (see page 17) but can also be installed on existing builder's curbs.

Ventilation options are available.

Performance

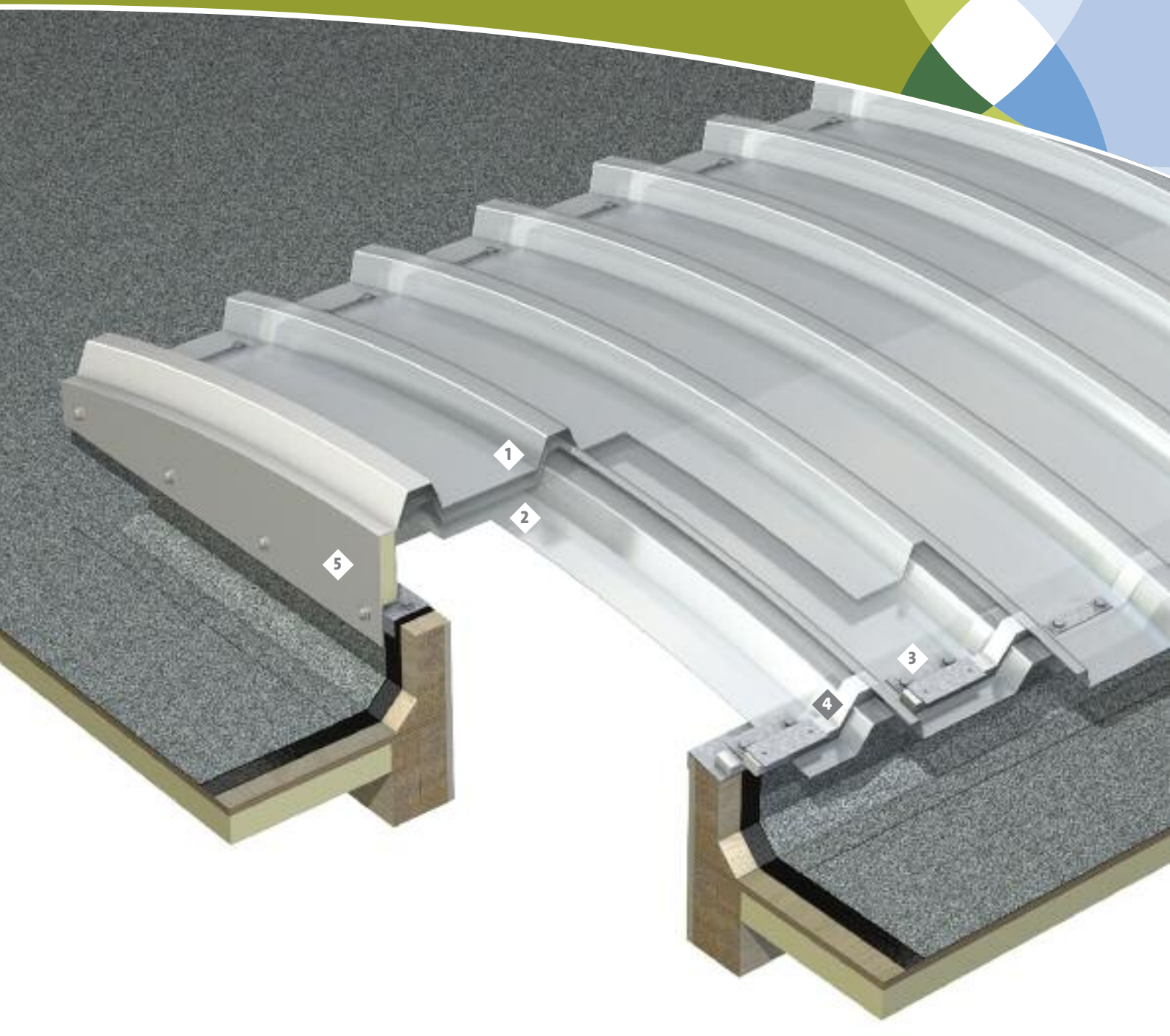
The system has a very high resistance against chemical influences and weather conditions and carries a 20 year hailproof guarantee. Fire tests have been carried out and the units are certified according to EN 1187.

T-vault barrel vault standard section sheet dimensions



T-Vault key features

1. Profiled GRP outer skin
2. Profiled GRP inner skin
3. Z-Plate fixing
4. Profiled foam seal
5. Insulated end panel



T-Vault glazing options

Features

- ‘Non-fragile’ version available tested to 1200 J – EN 14963: 2006
- Available in single, double or triple skin GRP
- Spans up to 4m wide and unlimited length
- 20 years hailproof guarantee
- Extremely high chemical resistance suited to industrial conditions
- European Technical Agrément certificated (ATG No. 96/1873)
- Building Regulations ADL compliant options

T-Vaults in opal diffused

Glazing

Continuous barrel vault rooflights, available in single, double or triple skin versions. The barrel vault is made up of a series of curved and interlocking profiled GRP sheets. The sheets are 1070 mm wide and have a bending radius of 3150mm.

All outer sheets are supplied in Longlife GRP which are UV stabilised and finished with a protective film that provides an extremely high level of UV stabilisation to maintain transparency and prevent ageing.

Single skin | Double skin | Triple skin

Glazing finish

Clear | Opal diffused | ‘HeatReflect’

Size

T-Vaults are purpose-made and available in widths from 1.0m to 4.0m and in unlimited length.

Performance of GRP glazing

Typical values	standard	fire retardant
Fire ratings		
BS 476: Part 3 BS 476: Part 7	AB Class 3	AA Class 1
Service temperature	-50 to +120°C	-50 to +120°C
Resistance to wind load	Class 2	Class 2
Air permeability	Class 2	Class 2
Resistance to water penetration	Class 9a	Class 9a
Impact test	1200 J	1200 J
Wind driven rain/snow 600Pa	Pass	Pass

Glazing specification

	Single Clear	Single Opal	Single HeatReflect	Double Clear	Double Opal	Double HeatReflect	Triple Clear	Triple Opal	Triple HeatReflect
Light transmission (LT %)	87%	63%	86%	76%	54%	66%	66%	48%	57%
Solar heat gain factor (g %)	0.77	0.47	0.45	0.67	0.41	0.39	0.58	0.36	0.34
Thermal transmission (W/m²K)	5.74	5.74	5.74	3.13	3.13	3.13	2.16	2.16	2.16

T-Vault curbs

T-Vaults in opal diffused

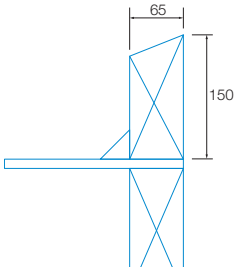
Upstands

The T-Vault is normally fixed directly to a splayed top builder's curb, which can be made of timber, concrete or metal. Dead and imposed loadings plus lateral thrust calculations can be calculated according to the information below.

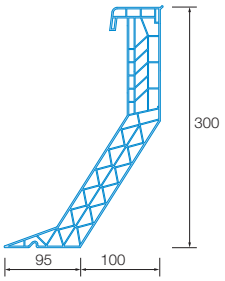
Fixings

The sheets are installed with corrosion resistant fixings located centrally between crowns. All fixings and synthetic foam fillers are included as well as the mounting accessories for the end panels.

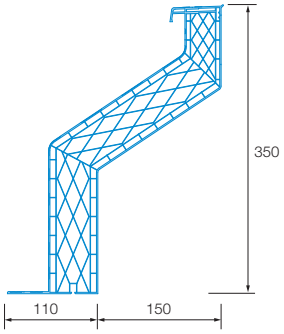
The Z-Fixing system ensures that the inner and outer skins are kept a constant distance apart.



Builder's curb



Em-Curb PVC-u 300/s



Em-Curb PVC-u 350/s

Curb angle

Span (m)	Angle (α)
1.0	10°
1.5	15°
2.0	20°
2.5	25°
3.0	30°
3.5	35°
4.0	40°

Note: On the long sides the curb top should be splayed as noted in the table above. Curbs at each end of the rooflight should be horizontal.

Vertical and horizontal forces

Vertical force

$V = \frac{P \times S}{2}$ where:

V = vertical force per metre (N/m)

P = snowload + deadweight (N/m²)

S = clear span (m)

Horizontal force

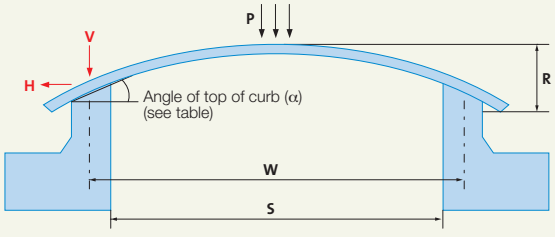
$H = \frac{P \times W^2}{8R}$ where:

H = horizontal force per metre (N/m)

P = snowload + deadweight (N/m²)

W = barrel width (fixing centres) (m)

R = barrel rise (m)



T-Vault ventilation options

Features

- Permanent
- Controllable rotating
- Controllable trickle
- Opening sections

T-Vault in clear

Permanent

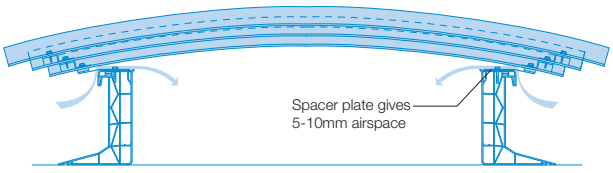
Permanent background ventilation is made possible with space plates. This provides a continuous weatherproof vent around the perimeter of the rooflight which suits areas such as corridors and storage where non-controllable background ventilation is required.

Controllable rotating

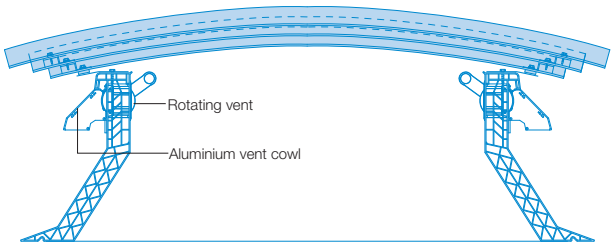
Controllable rotating vents are a fully insulated unit with enhanced thermal properties and can be fitted to two or four sides of a PVC Em-Curb or Em-Collar. With the vents on two sides, the unit will provide a minimum of 11,000mm² ventilation area. This increases with the length of the rooflight. Tested and certified according to EN 1873 –Watertightness.

The fully adjustable rotating vents are operated by means of a hooked rod, available in lengths of 1.5, 2, 3 or 4m.

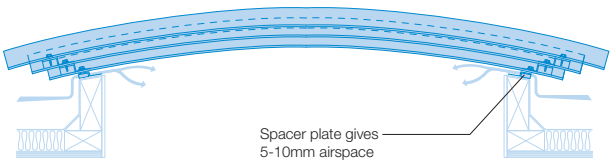
Fitted to Em-Curb



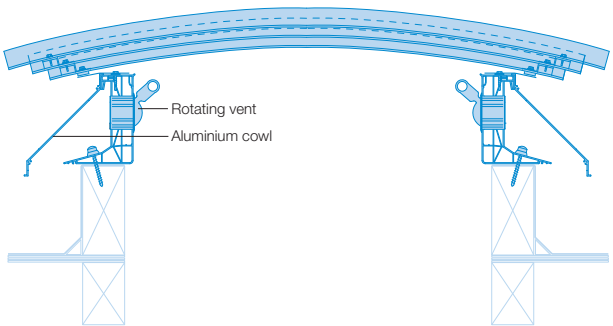
Fitted to Em-Curb



Fitted to builder's curb



Fitted to builder's curb



Case study	Warehouse
Project type	Refurbishment
Products	T-Vault
Glazing	GRP double skin opal diffused
Upstand	Site formed timber upstand

T-Vault installation & operation

T-Vault in oipal diffused

T-Vault in oipal diffused

Whitesales rooflights and accessories can generally be regarded as 'maintenance free'. However, the following guidelines should be followed to optimize their usefulness. Any maintenance of rooflights must of course be carried out strictly in accordance with the relevant 'Health and Safety' regulations.

T-Vault

Operation

T-Vaults are fixed at installation stage to the relevant upstand, and are a means of allowing natural light into the area below.

T-Vaults can be supplied as 'Non-Fragile', but should not be trafficked.

Maintenance

Wash only with warm soapy water. DO NOT USE strong detergents or abrasives.

Physically check Barrel Vaults annually to ensure fixings are secure.

Em-Curb

Operation

Normally manufactured in extruded PVCu.

Em-Curbs provide a proprietary upstand detail for T-Vaults.

Maintenance

Maintenance free.

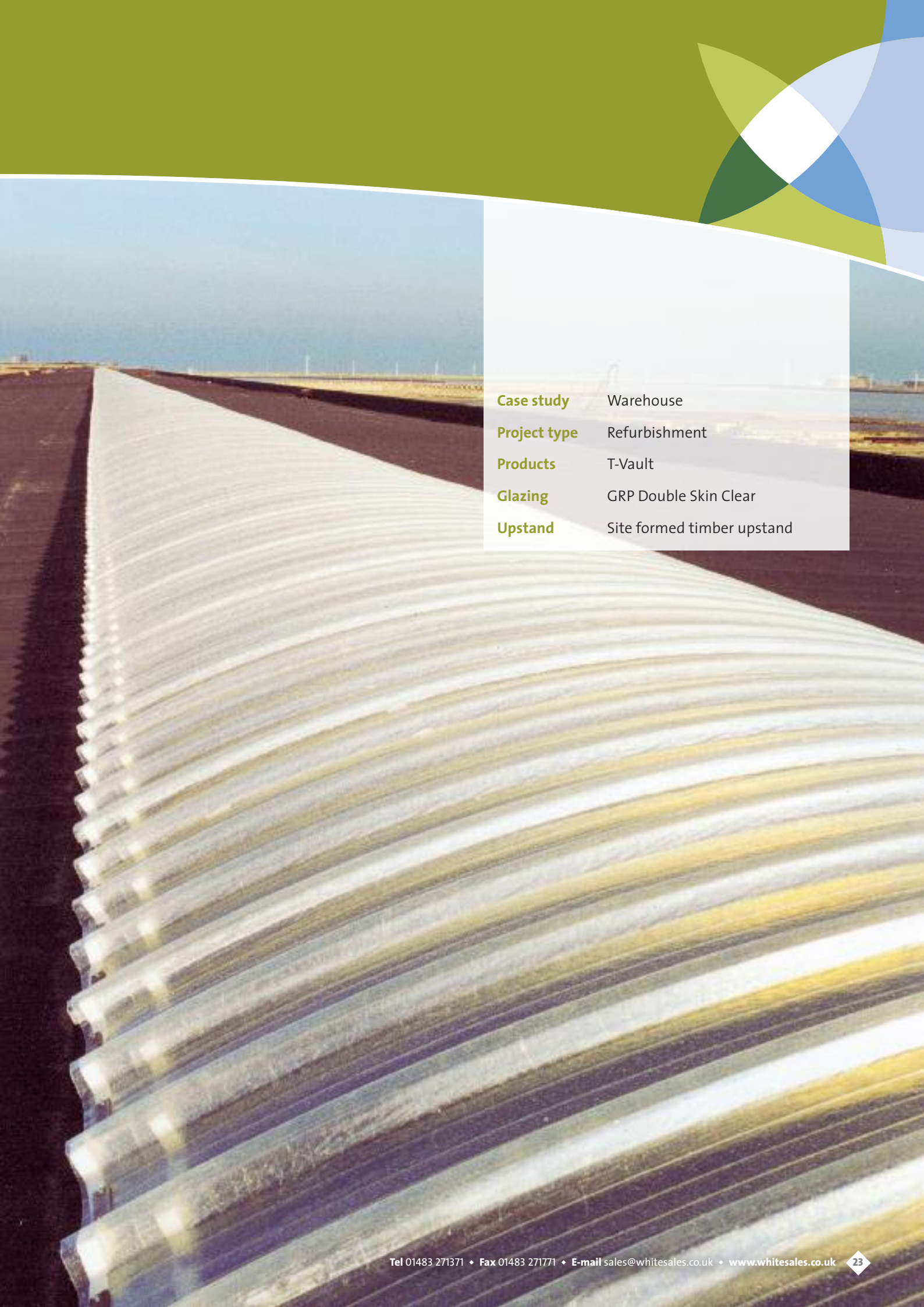
Passive ventilation

Operation

Normally by means of 'Trickle', 'Louvre' or 'Rotating' vents, to provide background ventilation. Trickle vents are adjusted by hand. Louvre and Rotating vents are adjusted by a proprietary operating rod – available in 1.5, 2, 3 or 4m lengths. Louvre vents require a sharp upwards push to fully close.

Maintenance

Maintenance free.

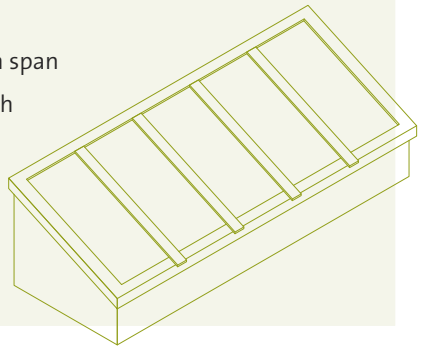


Case study	Warehouse
Project type	Refurbishment
Products	T-Vault
Glazing	GRP Double Skin Clear
Upstand	Site formed timber upstand

Em-Glaze monopitch rooflights

Features

- Choice of glazing
- Ventilation options
- Building Regulation ADL compliant options
- Purpose made
- Size 0.6m to 6m span
- Unlimited length



Em-Glaze monopitch in glass with opening sections

Description

Monopitch (out-of-plane) rooflights are purpose-made continuous rooflights and are available in 0.6m to 6m sloped lengths, and are suited to a curb slope pitch of between 15-75°.

Monopitch rooflights are manufactured from proprietary aluminium extrusions. Available with hermetically sealed glass units or polycarbonate glazing systems the rooflights are installed on site into the aluminium system.

Each rooflight run is terminated with either a capping or a wall abutment section. Bays are designed at equal centres of up to 1000mm, which will be sized in accordance with the required dimensions and glass specifications.

Units can incorporate opening vents, operated manually or by 24 or 230V electric actuators, for comfort ventilation.

Installation

Installed onto a waterproof builder's kerb

Options

A variety of options are available including self cleaning, solar control and fire rated. Aerogel is a multiwall polycarbonate filled with translucent aerogel granules, giving an even spread of diffused light and excellent thermal properties.

Performance – polycarbonate

Fire ratings	BS 476: Part 7 'Class 1', Tp(a) for 1991 BR
Non-fragile option available	ACR(M)001: 2005 Class B
Pitch angle	15° minimum
Loadings	Wind: 640 N/m² Snow: 750 N/m²

Glazing

There are many glazing options available – some of which are shown below. Where glass is specified, the thickness and type is determined by the size and configuration of the rooflight unit. Special requirements can normally be accommodated.

Double skin polycarbonate

Triple skin polycarbonate

Multiwall 25mm

Aerogel 25mm

Double glazed (6mm thick glass)

Glazing specification

	Polycarbonate double solid	Polycarbonate triple solid	Polycarbonate Multiwall 25mm	Polycarbonate Aerogel 25mm	Glass Double glazed
Light transmission (LT %)	77%	70%	49%	59%	78%
Solar heat gain factor (g %)	69%	60%	48%	61%	68%
Sound reduction (dB)	20	22	18	26	34
Thermal transmission (W/m²K)	2.68	1.78	1.3	0.99	1.2

All values for clear glazing

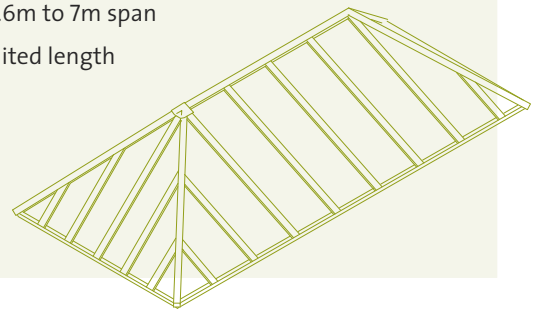
Key features

1. Wall abutment detail
2. Many glazing options
3. Polyester powder coated framework

Em-Glaze gable & hip ended ridgelights

Features

- Choice of glazing
- Ventilation options
- Building Regulation ADL compliant options
- Purpose made
- Size 0.6m to 7m span
- Unlimited length



Em-Glaze gable ended ridgelights in glass

Description

Gable and Hip Ended rooflights are purpose-made continuous rooflights and are available in spans of 0.6m up to 7m, and slope pitch of 15° to 60° although 30° is supplied as standard.

Gable and Hip Ended rooflights are manufactured from proprietary aluminium extrusions. Available with hermetically sealed glass units or polycarbonate glazing systems the rooflights are installed on site either to a site formed upstand or to a proprietary Em-Curb upstand.

Each rooflight run is terminated with glazed gable ends, hipped ends, wall abutments or open ends. Bays are designed at equal centres, which will be sized in accordance with the required dimensions and glass specifications. Units can incorporate angles and other specialist detailing.

Units can incorporate opening vents, operated manually or by 24 or 230V electric actuators, for comfort or Smoke Ventilation.

Installation

Installed onto a PVC Em-Curb upstand or waterproof builder's curb.

Options

A variety of options are available including self cleaning, solar control and fire rated. Aerogel is a multiwall polycarbonate filled with translucent aerogel granules, giving an even spread of diffused light and excellent thermal properties.

Performance – polycarbonate

Fire ratings	BS 476: Part 7 'Class 1', Tp(a) for 1991 BR
Non-fragile option available	ACR(M)001: 2005 Class B
Pitch angle	30° as standard with 15-60° also available
Loadings	Wind: 640 N/m² Snow: 750 N/m²

Glazing

There are many glazing options available – some of which are shown below. Where glass is specified, the thickness and type is determined by the size and configuration of the rooflight unit. Special requirements can normally be accommodated.

Double skin polycarbonate

Triple skin polycarbonate

Multiwall 25mm

Aerogel 25mm

Double glazed (6mm thick glass)

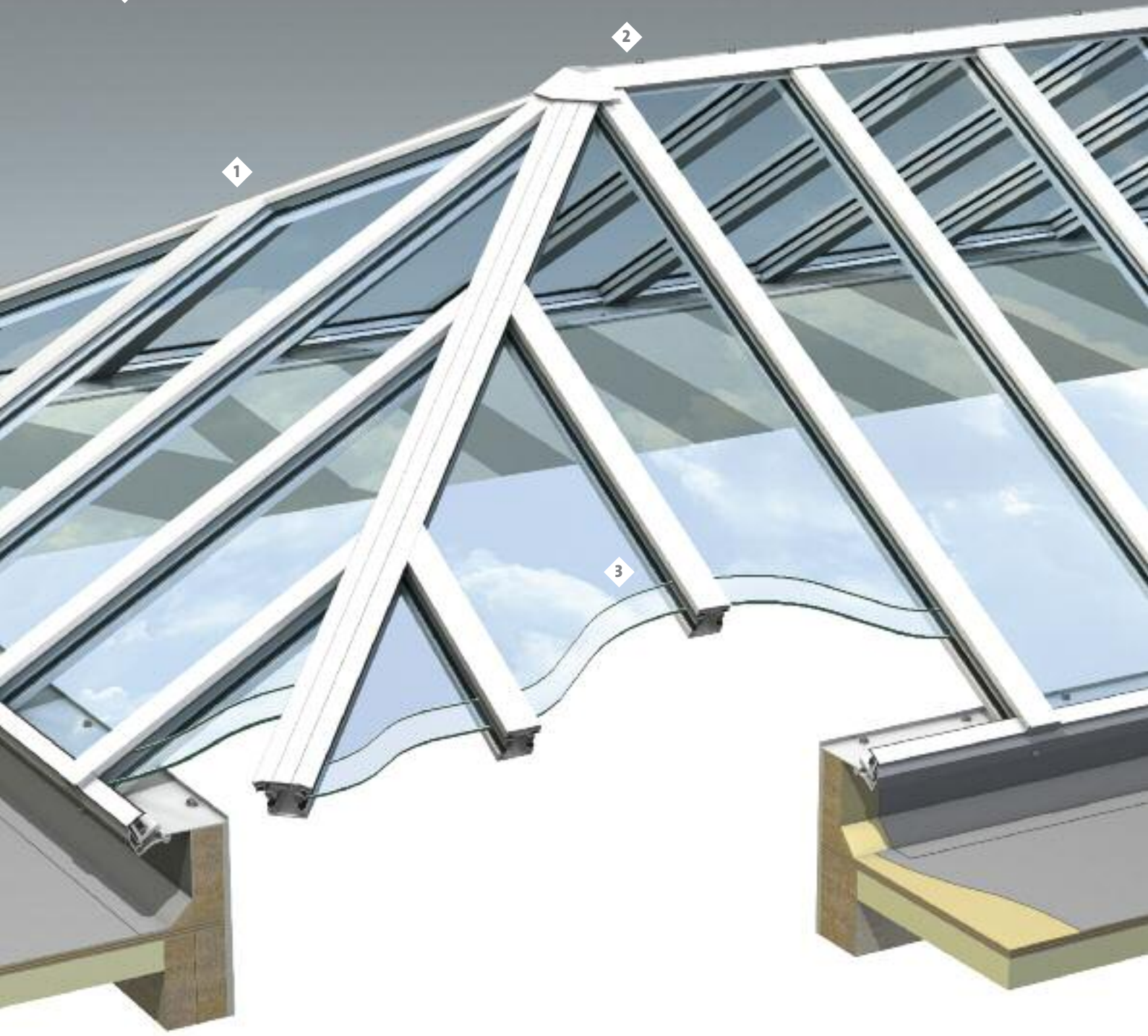
Glazing specification

	Polycarbonate double solid	Polycarbonate triple solid	Polycarbonate Multiwall 25mm	Polycarbonate Aerogel 25mm	Glass Double glazed
Light transmission (LT %)	77%	70%	49%	59%	78%
Solar heat gain factor (g %)	69%	60%	48%	61%	68%
Sound reduction (dB)	20	22	18	26	34
Thermal transmission (W/m²K)	2.68	1.78	1.3	0.99	1.2

All values for clear glazing

Key features

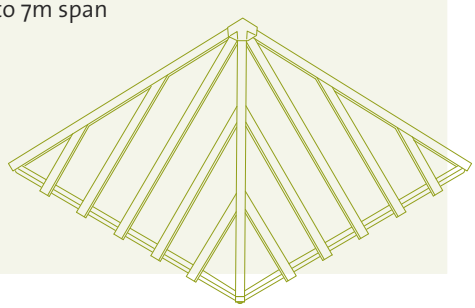
1. Hip ended (gable also available)
2. Self supporting
3. 30° pitch as standard



Em-Glaze pyramid rooflights

Features

- Choice of glazing
- Ventilation options
- Building Regulation ADL compliant options
- Purpose made
- Size 0.6m to 7m span



Em-Glaze pyramid in glass with electric openers

Description

Pyramid rooflights are purpose-made, self supported rooflights and are available in spans of 0.6m up to 7m, and slope pitch of 15° to 60° although 30° is supplied as standard.

Pyramid rooflights are manufactured from proprietary aluminium extrusions. Available with hermetically sealed glass units or polycarbonate glazing systems the rooflights are installed on site either to a site formed upstand or to a proprietary Em-Curb upstand.

Each rooflight is designed as having four equal sloped sides. Bays are designed at equal centres, which will be sized in accordance with the required dimensions and glass specifications.

Units can incorporate opening vents, operated manually or by 24 or 230V electric actuators, for comfort or Smoke Ventilation.

Installation

Installed onto a PVC Em-Curb upstand or waterproof builder's curb.

Options

A variety of options are available including self cleaning, solar control and fire rated. Aerogel is a multiwall polycarbonate filled with translucent aerogel granules, giving an even spread of diffused light and excellent thermal properties.

Performance – polycarbonate

Fire ratings	BS 476: Part 7 'Class 1', Tp(a) for 1991 BR
Non-fragile option available	ACR(M)001: 2005 Class B
Pitch angle	30° as standard with 15-60° also available
Loadings	Wind: 640 N/m² Snow: 750 N/m²

Glazing

There are many glazing options available – some of which are shown below. Where glass is specified, the thickness and type is determined by the size and configuration of the rooflight unit. Special requirements can normally be accommodated.

Double skin polycarbonate

Triple skin polycarbonate

Multiwall 25mm

Aerogel 25mm

Double glazed (6mm thick glass)

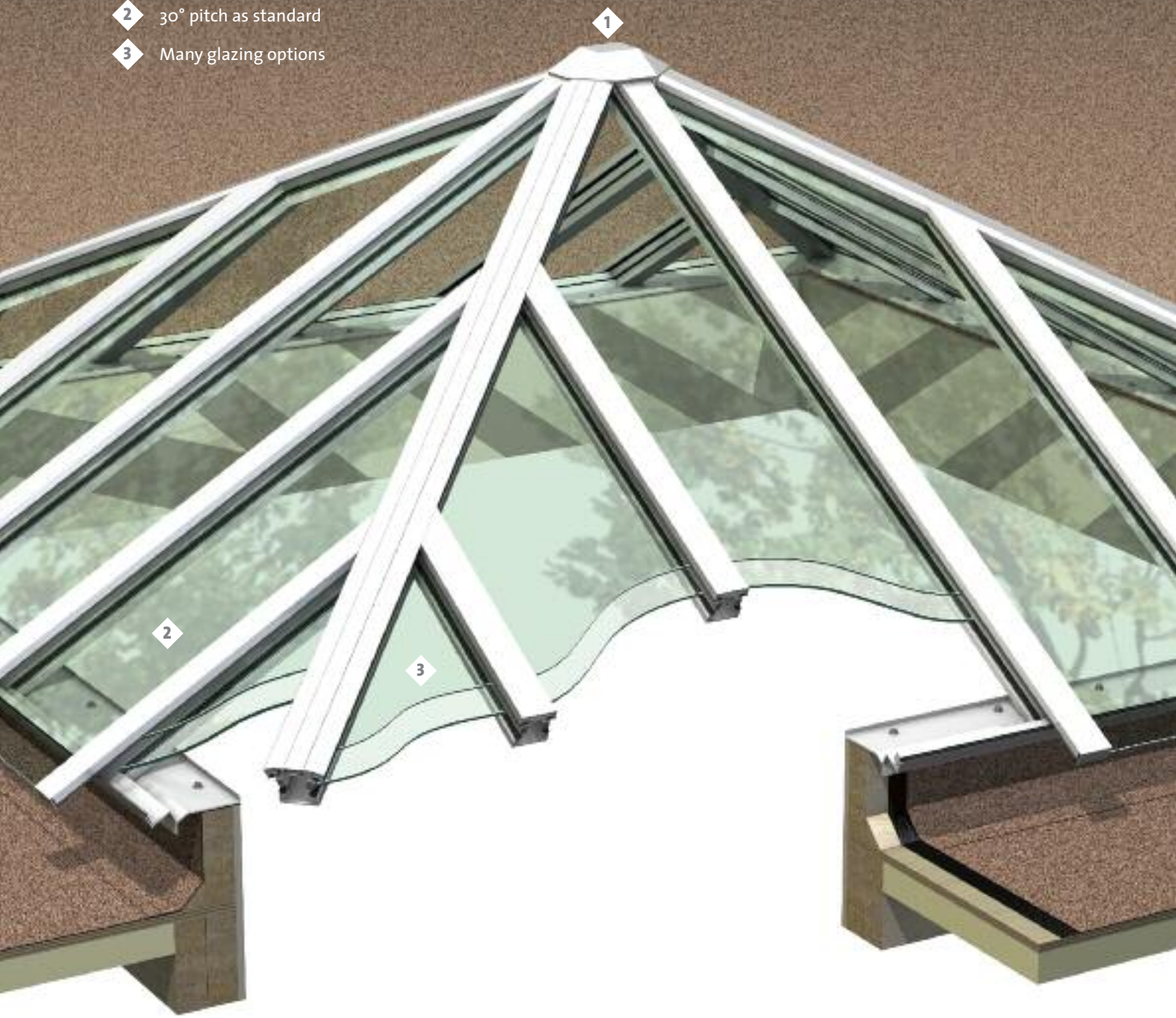
Glazing specification

	Polycarbonate double solid	Polycarbonate triple solid	Polycarbonate Multiwall 25mm	Polycarbonate Aerogel 25mm	Glass Double glazed
Light transmission (LT %)	77%	70%	49%	59%	78%
Solar heat gain factor (g %)	69%	60%	48%	61%	68%
Sound reduction (dB)	20	22	18	26	34
Thermal transmission (W/m²K)	2.68	1.78	1.3	0.99	1.2

All values for clear glazing

Key features

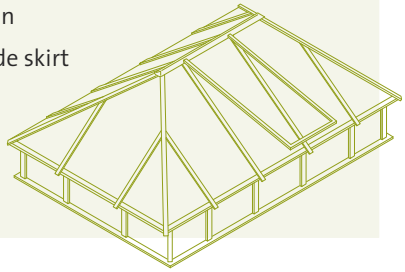
1. Self supporting
2. 30° pitch as standard
3. Many glazing options



Em-Glaze lantern lights

Features

- Choice of glazing
- Gable or hip ends
- Ventilation options
- Building Regulation ADL compliant options
- Purpose made
- Size 1m to 3m span
- Vertical glazed side skirt
- Unlimited length



Em-Glaze gable ended lantern light in tinted glass

Description

Lantern lights are purpose-made continuous rooflights and are available in 1m to 3m spans, and slope pitch from 15° to 60° although 30° is supplied as standard.

Lantern lights are manufactured from proprietary aluminium extrusions. Available with hermetically sealed glass units or polycarbonate glazing systems the rooflights are installed on site into the aluminium system.

Each rooflight run can be supplied with gable or hip ends. Bays are designed at equal centres, which will be sized in accordance with the required dimensions and glass specifications.

Units can incorporate opening vents, operated manually or by 24 or 230V electric actuators, for comfort or Smoke Ventilation.

Installation

Installed onto a waterproof builder's kerb.

Options

A variety of options are available including self cleaning, solar control and fire rated. Aerogel is a multiwall polycarbonate filled with translucent aerogel granules, giving an even spread of diffused light and excellent thermal properties.

Performance – polycarbonate

Fire ratings	BS 476: Part 7 'Class 1', Tp(a) for 1991 BR
Non-fragile option available	ACR(M)001: 2005 Class B
Pitch angle	30° as standard with 15-60° also available
Loadings	Wind: 640 N/m² Snow: 750 N/m²

Glazing

There are many glazing options available – some of which are shown below. Where glass is specified, the thickness and type is determined by the size and configuration of the rooflight unit. Special requirements can normally be accommodated.

Double skin polycarbonate

Triple skin polycarbonate

Multiwall 25mm

Aerogel 25mm

Double glazed (6mm thick glass)

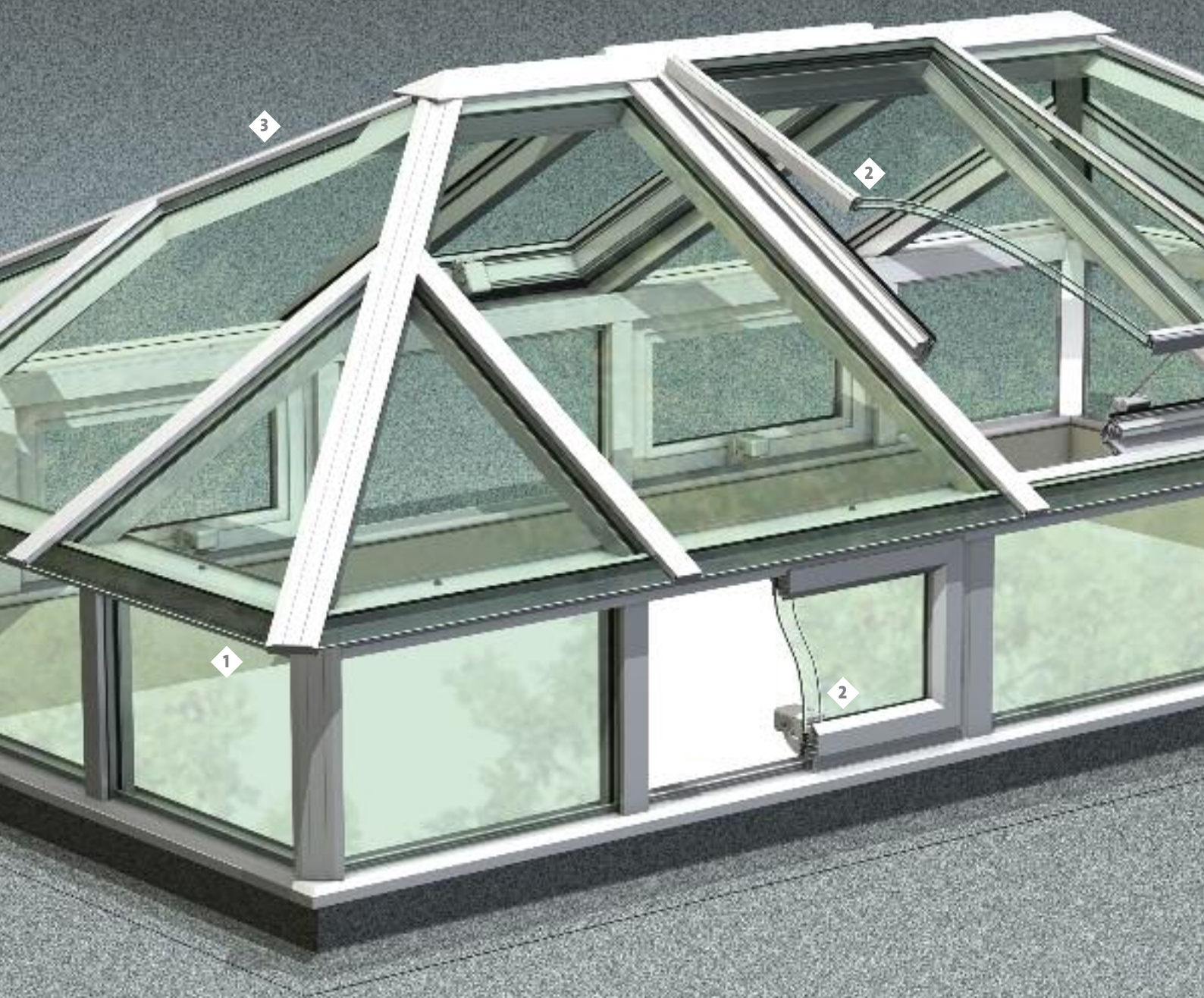
Glazing specification

	Polycarbonate double solid	Polycarbonate triple solid	Polycarbonate Multiwall 25mm	Polycarbonate Aerogel 25mm	Glass Double glazed
Light transmission (LT %)	77%	70%	49%	59%	78%
Solar heat gain factor (g %)	69%	60%	48%	61%	68%
Sound reduction (dB)	20	22	18	26	34
Thermal transmission (W/m²K)	2.68	1.78	1.3	0.99	1.2

All values for clear glazing

Key features

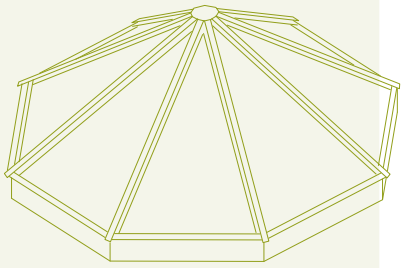
1. Glazed vertical upstand
2. Ventilation options
3. Hip ended (gable also available)



Em-Glaze custom design rooflights

Features

- Choice of glazing
- Polygon, domed and flat options
- Building Regulation ADL compliant options
- Purpose made



Em-Glaze octagonal unit in glass

Description

Specialist rooflights are purpose-made bespoke rooflights designed to accommodate an extensive range of shape and size requirements. Whilst polygon and domed shapes are more common there are many other possibilities such as elliptical and other curved designs.

Specialist rooflights are manufactured from proprietary aluminium extrusions. Available with hermetically sealed glass units or polycarbonate glazing systems the rooflights are installed on site into the aluminium system.

Each rooflight will include bespoke flashing and cill details to suit the design requirements.

Ventilation options can often be incorporated within the rooflights.

Installation

Installed onto a waterproof builder's kerb.

Options

A variety of options are available including self cleaning, solar control and fire rated. Aerogel is a multiwall polycarbonate filled with translucent aerogel granules, giving an even spread of diffused light and excellent thermal properties.

Performance – polycarbonate

Fire ratings	BS 476: Part 7 'Class 1', Tp(a) for 1991 BR
Non-fragile option available	ACR(M)001: 2005 Class B
Pitch angle	30° as standard with 15-60° also available
Loadings	Wind: 640 N/m² Snow: 750 N/m²

Glazing

There are many glazing options available – some of which are shown below. Where glass is specified, the thickness and type is determined by the size and configuration of the rooflight unit. Special requirements can normally be accommodated.

Double skin polycarbonate

Triple skin polycarbonate

Multiwall 25mm

Aerogel 25mm

Double glazed (6mm thick glass)

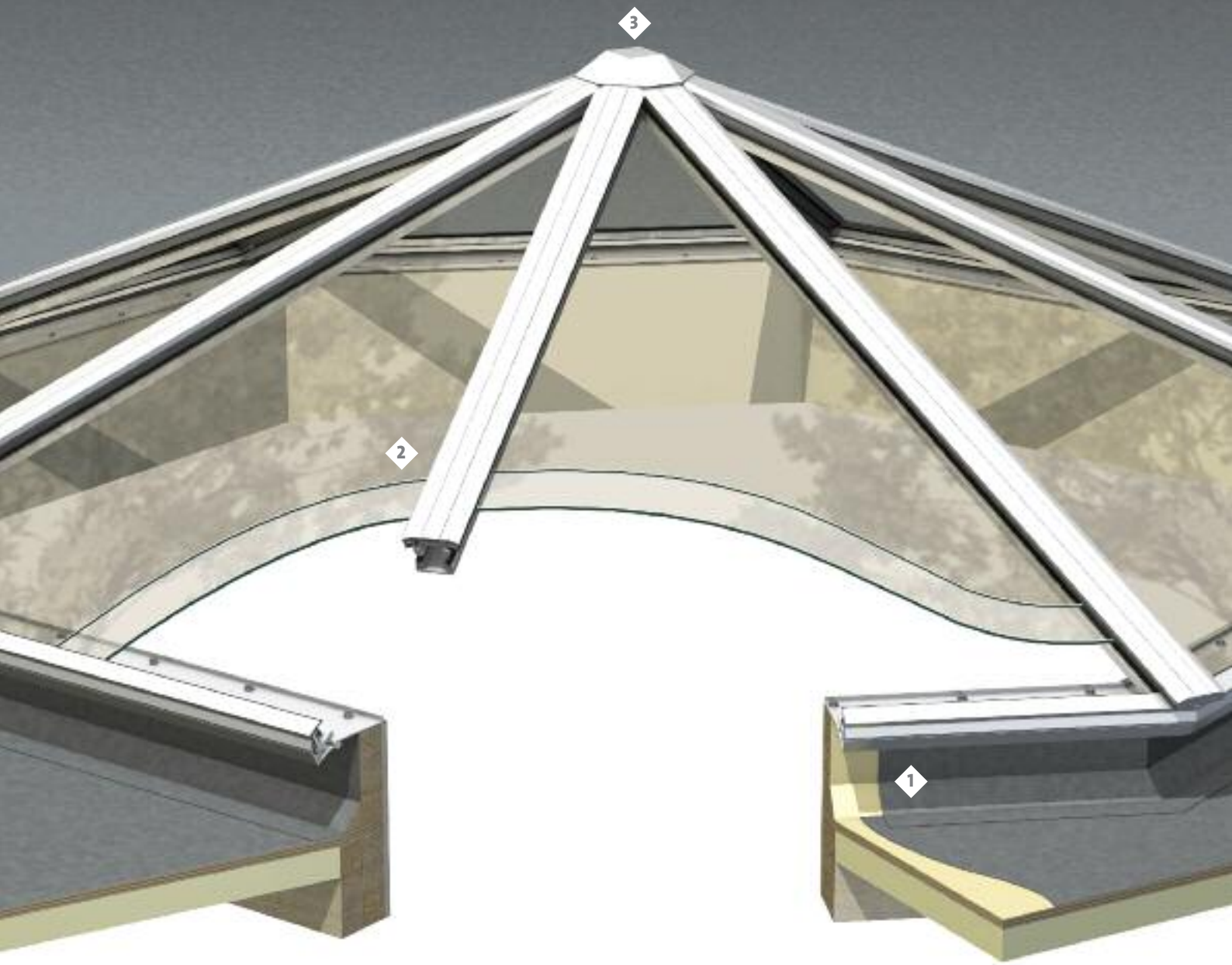
Glazing specification

	Polycarbonate double solid	Polycarbonate triple solid	Polycarbonate Multiwall 25mm	Polycarbonate Aerogel 25mm	Glass Double glazed
Light transmission (LT %)	77%	70%	49%	59%	78%
Solar heat gain factor (g %)	69%	60%	48%	61%	68%
Sound reduction (dB)	20	22	18	26	34
Thermal transmission (W/m²K)	2.68	1.78	1.3	0.99	1.2

All values for clear glazing

Key features

1. Custom design
2. Octagonal shape
3. Self supporting



Design considerations

Whitesales is able to advise on current requirements and regulations. The following pages summarise some of the key considerations that should be taken into account when specifying rooflights.

Approved Document L 2010: Conservation of fuel and power

Introduction

This Approved Document, which takes effect on 1 October 2010, deals with energy efficiency requirements in the Building Regulations (as amended) and is made up of four distinct publications which are summarised below. It should be noted that Approved Documents are guidance publications and there is some provision for trade-off with other building elements – any proposal should be checked with the relevant building control body. U-Values should be calculated in accordance with BRE 2006. The document also covers areas such as Materials and Workmanship including a requirement to demonstrate appropriate use of products with CE marking, British Standards and European Technical Approvals. Whitesales continuous rooflights have undergone stringent and extensive testing and are certified to these standards.

Solar heat gain

Approved Documents L1A and L2A include requirements to limit solar gains through the summer period. The inside of the building can heat up during daylight hours due to the sun. This is termed as solar heat gain. To reduce this effect, solar control glass can be adopted to reflect heat and reduce glare from the sun's rays. This lessens the burden on air-conditioning systems thus reducing CO_2 emissions. In simple form, this may be body tinted glass in blue, green or bronze or more sophisticated, coated clear glass that allows maximum light transmission, but at the same time substantially reduces heat gain. For continuous rooflights values, see page 9 of this brochure – Solar heat gain factor (g%).

Optimum rooflight provision

A building's design will affect the contribution rooflights can make. The optimum area of rooflights will therefore vary for each building. However, research has shown that a rooflight area of 15-20% will contribute to an overall reduction in CO_2 emissions in most buildings. Rooflights are up to three times more effective at supplying daylight than vertical windows. Where artificial lighting is controlled by daylight sensors, installing rooflights can result in a significant reduction in the energy used for lighting. Energy consumed in lighting a building is often greater than that used to heat it. In addition, the SAP and SBEM software programs take account of the contribution made by passive solar gains through rooflights. Solar gains help to offset the increased heat loss of rooflights compared to the insulated main roof.

Air permeability

Air permeability is the physical property used to measure airtightness of the building fabric. It is defined as air leakage rate per hour per square metre of building envelope at the test reference pressure differential across the building envelope of 50 Pascal (50N/m²). The limiting air permeability is the worst allowable air permeability. The design air permeability is the target value set at design stage, and must always be no worse than the limiting value. The assessed air permeability is the value used in establishing the BER, and is based on a specific measurement of the building concerned.

ADL 1A: New dwellings

This document sets a minimum energy performance requirement called the 'Target CO_2 Emission Rate' (TER), and 'Dwelling CO_2 Emission Rate' (DER). The aim is to improve the overall building envelope rather than specific elements hence improvements in one area can be used to offset other areas of poorer performance. Section 4.20 covers 'Window, roof window, glazed rooflight, curtain walling and pedestrian door'. Specifically rooflights must conform to a U-value of no more than 2.00W/m²K and the calculation is based on the value of the complete rooflight unit rather than the values of any one component part.

ADL 1B: Existing dwellings

Section 4.19 covers 'Window, roof window or rooflight' The document states that where windows, roof windows or rooflights are to be provided, the reasonable provision – in normal cases – would be the installation of draught-proofed units whose performance is no worse than a U-value of 1.6W/m²K or complying with the Window Energy Rating System, B and C.

ADL 2A: New buildings other than dwellings

This document sets a minimum energy performance requirement called the 'Target CO_2 Emission Rate' (TER), and 'Building CO_2 Emission Rate' (BER). The aim is to improve the overall building envelope rather than specific elements hence improvements in one area can be used to offset other areas of poorer performance. Section 4.30 covers 'Window, roof window, glazed rooflight, curtain walling and pedestrian door'. Specifically rooflights must conform to a U-value of no more than 2.2W/m²K. The calculation is based on the developed area of the rooflights rather than the roof aperture and is the value of the complete rooflight unit rather than the values of any one component part. Also included are 'Roof ventilators (inc. smoke vents)' which must conform to a U-value of no more than 3.5W/m²K.

ADL 2B: Existing buildings other than dwellings

Section 4.23 covers 'Window, roof window and glazed rooflight' and 'Plastic rooflight'. Specifically plastic rooflights must conform to a U-value of no more than 1.8W/m²k. Also included are 'Roof ventilators (inc. smoke vents)' which must conform to a U-value of no more than 3.5W/m²K.

Approved Document B 2006: Fire Safety

Approved Document B places certain limitations on the use of rooflights, which are dependent on glazing material and site circumstances, such as building size, use of area below rooflights, rooflight size and proportion of total roof area, distance from boundary etc. The relevant information is set out in Volume 1: Sections 3 and 10; Volume 2: Sections 6, 12 and 13 of Approved Document B, 2006 Edition. Where applicable, the responsibility for determining that any building component complies with the relevant Regulations rests solely with the customer or specifier.

Approved Document E 2003 (amended): Resistance to the passage of sound

This document requires that buildings are designed and constructed to provide resistance to sound and reverberation. The aim is to limit noise disturbance by including sufficient acoustic properties and insulation in areas such as internal and external walls, floors and other elements. Rooflights should perform in accordance with these requirements and the decibel reduction value can be used in calculations for this purpose. For Em-Dome acoustic values see page 9 of this brochure and for Em-Glaze Modular see page 24. Further information is available in Building Bulletin 93 – Acoustic Design for Schools.

Approved Document F: Means of ventilation

This document places the responsibility on the designer to comply with ventilation requirements to new and existing buildings. It states ventilation types including extract, whole building and purge and gives minimum ventilation requirements. Rooflights are often a useful means of complying with the requirements especially where no other external aperture is available. See pages 16-18 of this brochure for Em-Dome ventilation options. Further information is available in Building Bulletin 101 – Ventilation of School Buildings.

BS 6229

BS 6229: 1982, Code of Practice for flat roofs with continuously supported coverings, requires rooflights to incorporate upstands to raise them at least 150mm above the uppermost roof surface to which the roof covering is bonded or dressed. The designer should ensure that the builder's curb is at least 150mm high.

BRE BR443

Various standards deal with the calculation of U-values of building elements. The conventions provide guidance on the use of the standards, indicating the methods of calculation that are appropriate for different constructional types, providing additional information about using the methods and providing data relevant to typical UK constructions. The U-value conventions were originally published by the BRE in 2002 and the 2006 edition is an update which provides additional information and reflects changes in the underlying British Standards. The U-Value calculation methods are also referred to in Approved Documents L1A, L1B, L2A and L2B.

> "Rooflights are up to **three times more effective** at supplying daylight than vertical windows."

Condensation

Condensation occurs where warm moist air meets cold surfaces. As warm air rises, the risk of condensation forming at rooflight level is relatively greater than at lower level. The risk can be minimised by specifying triple skin Whitesales continuous rooflights and Em-Curb insulated upstands. The provision of ventilation may also assist (see options on pages 16-18). However, because temperature and humidity levels are clearly beyond our control, no guarantee can be given against the formation of condensation.

Condensation between the skins can also occur when the room below has high humidity levels, for example during construction from new plaster or paintwork. Polycarbonate is hygroscopic and allows water molecules to filter through – the water pressure forces its way through the lower skin and condenses inside the cavity. However, once the humidity level in the room is restored to normal this condensation dissipates through the breathable seals.

Limitations on use

Whitesales continuous rooflights are designed for use in normal circumstances on flat roofs up to 20° pitch. For applications in excess of 20° or in unusual circumstances (e.g. extreme temperature or climatic conditions) please refer to Whitesales. Please note that all information supplied is based on our best knowledge and general experience. Because of factors outside our control which can affect installation and use of products, no warranty is given or implied in respect of information provided. A policy of continuous product improvement applies and Whitesales therefore reserve the right to alter specifications without prior notice.

Health & Safety

Construction (Design & Management) Regulations 2007

According to the Health and Safety Executive, almost 20% of deaths in the construction industry are caused by falls from or through roofs. The majority of these falls are through fragile materials such as asbestos cement roofing or old/fragile rooflights.

The Construction (Design and Management) Regulations 2007 places a duty on designers and specifiers to give proper consideration to eliminating or reducing risks at the design stage. Health and Safety Executive (HSE) Health and Safety in Roof Work draws attention to the responsibilities of those specifying rooflights.

(HSE) Health and Safety in Roof Work states that where rooflights are required, designers should consider:

- Specifying rooflights that are Non-Fragile.
- Fitting rooflights designed to project above the plane of the roof and which cannot be walked on (these reduce the risk but they should be capable of withstanding a person falling onto them).
- Protecting rooflight, e.g. by means of mesh or grids fitted below or above the rooflight
- Specifying rooflights with a design life that matches that of the roof, taking account of the likely deterioration due to ultraviolet exposure, environmental pollution and internal and external building environment.

For specifiers the key message is to eliminate 'fragile' materials from roof design. For contractors, provide effective fall arrest equipment or safety netting.

Non-fragile rooflights

Whitesales continuous rooflights are out-of-plane rooflights, and provided they are specified with polycarbonate glazing, can be deemed to be 'non-fragile'.

- Polycarbonate continuous rooflights have been designed according to EN 1873 2005 [E] to an energy of 1200J and to ACR[M] 001: 2005 and can be classified as Class B 'Non-Fragile'.
- Whitesales offers a 10 year warranty against discolouration of polycarbonate glazing material and loss of impact strength, underwritten by the sheet material supplier.
- Whitesales offers a post-forming warranty backed by the sheet manufacturer.

Man-safe

Man-safe is a term often used within the construction industry to mean that the product can withstand foot traffic. However man-safe has no recognised definition and 'Non-Fragile' does not qualify a product to be used as a thoroughfare.

Whilst glazing and other accessories may be designed to safely resist the impact of a human body falling against it, the wilful act of walking on any kind of roof glazing must be forbidden at all times.

The act of walking upon a glazed structure can cause microscopic damage that, in time, may have a detrimental effect upon the impact performance of the system.

Walking upon glazing may encourage a practice that could lead to general disregard for the rating of said glazing, with catastrophic consequences.

Safety data sheets are available on request.

Sitework

Handling and storage

While all Whitesales continuous rooflights and associated products are suitably packaged to avoid damage care should be exercised when handling. For moving larger items, two or more people may be needed. All products should be stored in flat dry conditions.

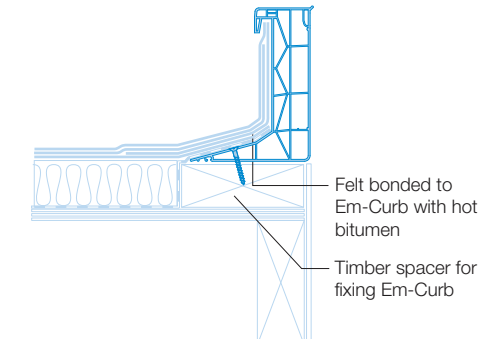
Installation

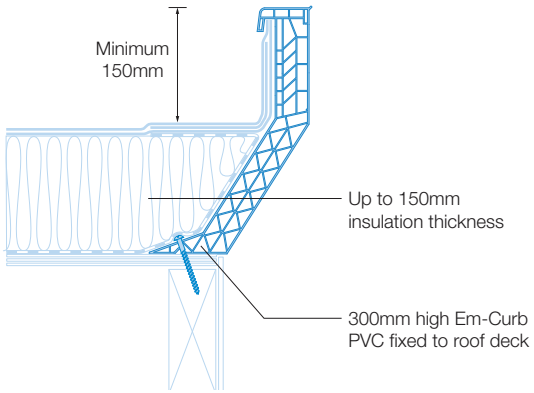
All Whitesales continuous rooflights are supplied in component form and are delivered to site in protective packaging. Full instructions and fixings are included with all products, and should be carefully studied prior to installation. We always recommend that a Whitesales approved installer is employed to carry out the works.

Fixing upstand curbs

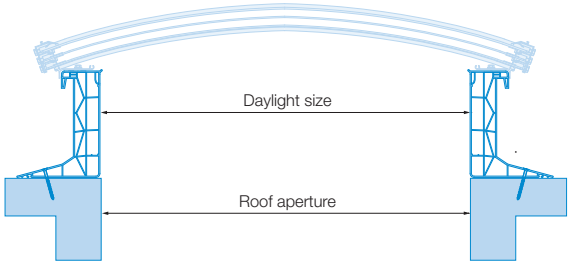
For fixing curbs to the roof structure, drill holes in the bottom flange, 100mm from each corner and at maximum 300mm centres and screw to roof structure. Typical installation details are shown below. The PVC-u Em-Curb is suitable for use with most flat roof systems including single ply, felt, hot-melt, asphalt, liquid and lead.

Where asphalt is specified, Whitesales recommend the use of PVC-u upstands with pre-fixed sheathing felt and expanded metal lathe. This must be specified if required.

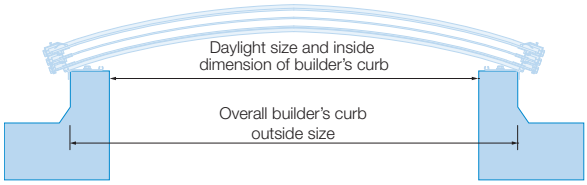




Fixing Em-Vault to Em-Curbs

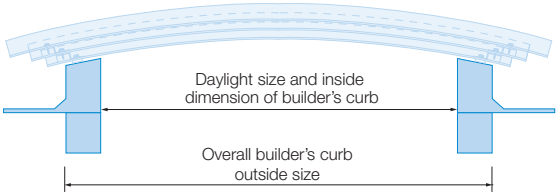


Fixing Em-Vault to builder's curbs



Fixing T-Vault to builder's curbs

Refer to the table on page 19 to determine the angle that the top of the curb must be set to.



Support services

Technical services

Advice and technical assistance on the application and specification of all rooflights and accessories is readily available from Whitesales.

Full technical advice is available, including technical specification writing, site surveys, condition reports and budget costings or fully detailed quotations.

A comprehensive library of product data sheets and CAD drawings is available along with NBS specifications.

For projects where we have undertaken a rooflight site survey we offer a CAD roof plan drawing service.

The Whitesales Customer Service Team works to respond immediately to customer request.

For more information, please contact us on:

Tel 01483 271371
Fax 01483 271771

E-mail sales@whitesales.co.uk
www.whitesales.co.uk

Nationwide coverage

With depots strategically located in England and Scotland, the service driven team is readily available, from your initial enquiry through to after sales support.

Project and larger consignments are delivered on Whitesales' own transport and delivery periods are determined on a per order basis.

Guarantees

All Whitesales continuous rooflights, when installed on Em-Curbs or Em-Collars and in accordance with manufacturer's instructions, are guaranteed against the effects of defective design, materials or construction for a period of ten years from date of supply by Whitesales. Furthermore, the glazing element of all Whitesales continuous rooflights is warranted against discolouration for ten years subject to certain conditions. A 20 year 'special projects' guarantee is also available. Further details available on request.

Whitesales continuous rooflights have an expected life of at least 25 years which would normally exceed the life of the roof waterproofing materials.

All other products (e.g. Em-Curbs, Em-Collars, ventilation systems, electrical components and other accessories) are guaranteed for 12 months from date of supply by Whitesales.

Whitesales holds Professional Indemnity Insurance, covering our designs and recommendations. Full details available on request.

Environment

Our responsibility

The environment and the effect we have upon it is one of the key issues facing the construction industry.

There is a growing demand for construction solutions which minimise the consumption and use of natural resources. Whitesales recognises the impact that we can have on the environment and is managing activities to maximise our contribution towards the protection of the environment and preservation of natural resources. This includes constant reviews of our manufacturing operations and distribution chain.

Sustainability

Sustainable developments ensure a better quality of life for everyone, now and for future generations. To be environmentally sustainable a product must be manufactured and used in a way that minimises its impact on the environment.

Sustainability covers all aspects of a product's impact on the environment. This includes original source of raw materials, the manufacturing process, transportation, construction, life span of the product and eventual disposal and re-use of the material.

Environmental policy

In maintaining and developing our business, products and services, we will pay careful attention to the following measures:

- Comply immediately with all applicable laws and regulations concerning the environment.
- Develop manufacturing processes and operational procedures that minimise, as far as practically possible, pollution risks to the environment.
- Reduce waste generated by our activities and encourage energy conservation, recycling and re-use.
- Provide training and support to employees to enable them to maximise their contribution towards the protection of the environment.
- Encourage suppliers, contractors and customers to share in our aims to promote good environmental management.

Whitesales®
Rooflights & more...

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