

# ROOFLIGHTS

Creating natural light  
ventilation and smoke evacuation



# AXTER ROOFLIGHTS – Creating natural light ventilation and smoke evacuation

## INTRODUCTION

Rooflights have long been recognised as an efficient means of bringing natural light to the interior of a building. In addition overhead daylighting and natural ventilation provide benefits in the form of a reduction in carbon emissions and running costs, allowing designers the opportunity to develop more environmentally friendly buildings. Automatic opening vents (AOV) are an effective means of protecting occupants escaping from a fire, allowing cool air into a building and smoke and hot air to flow out.

Axter has been manufacturing a complete range of rooftop equipment for natural daylighting, ventilation and smoke evacuation for over 50 years. Offering robust galvanised steel kerbs or adapter plates with a range of covers and control equipment, Axter can satisfy all expectations of the architect or building owner in terms of aesthetics, comfort and safety.

Innovative products, unrivalled quality and commitment to service make Axter the No. 1 choice for rooflights and smoke control equipment.

## FOUR ESSENTIAL FUNCTIONS



### Daylighting

Rooflights provide overhead natural daylight, saving energy on electric lighting and providing an evenly distributed light that enhances the internal environment. The health benefits of natural daylighting are well documented and Building Bulletin for Schools 90 "Lighting Design for Schools" recommends that natural lighting should always be the major source. Actual light levels depend upon the characteristics, dimensions and location of the installed units.



### Ventilation

Natural, controlled ventilation provides an effective alternative to air conditioning systems in modern buildings, creating healthy living conditions, a precondition for physical and mental well being. Installing ventilation units reduces energy consumption, lowers operating expenses and allows savings of investment cost of air conditioning plant. Permanent trickle ventilation, available on all Axter units, reduces condensation.



### Smoke Evacuation

In case of fire, natural smoke evacuation improves visibility to the emergency exits by partially evacuating smoke and combustion gases. This makes it easier for people to leave the building and allows the early intervention of firemen. Gas and smoke evacuation reduces the risk of fire propagation within the building.



### Roof Access

Safe and easy access to roofs can be provided without the need for external ladders or towers thus conforming to CDM requirements. Ladder attachments and grab handles enhance the safety aspects and inopportune intrusion can be prevented with grills and lockable gratings.



### Controls

Control mechanisms are required to open and close smoke evacuation and ventilation units. These fulfil regulations concerning smoke evacuation of public access buildings, protected stairwells, residential buildings etc. In addition to temperature sensitive, fail safe mechanisms, control can be mechanical, electromagnetic or pneumatic (CO<sub>2</sub>), linked to smoke detectors and to centralised control boxes as required.



## AUTHORITY

CE marked smoke evacuation units are available; these are marked in accordance with BS EN 12101-2:2003 *Smoke and heat control systems. Specification for natural smoke and heat exhaust ventilators.*

## SECURITY

Units are designed to resist a shock of 1200 joules, the equivalent of an 80 kg person falling 1.5m onto the cover. Fixed or hinged and lockable anti-intruder bars are available for all units.

## COMPOSITION

### **Kerbs**

Axter's rooflight kerbs are insulated and manufactured in 20/10 galvanised steel ensuring high resistance to corrosion and weathering. Assembly is by crimping, a technique used in the car industry, which avoids welding and achieves a high level of corrosion resistance. The finish can be plain galvanised, pre-coated Classic White to RAL 9010 or post painted to any RAL colour. The external surface is designed to

take reinforced bitumen membrane roofing but can be adapted for use with single-ply systems (PVC, EPDM, etc) or metal (copper, aluminium).

Unit bases are available in three options (see illustrations overleaf).

- 1) Full kerb integrated into the design
- 2) Adapter plate for use with an existing or new builders kerb
- 3) Z-frame for sitting a non-opening unit onto an existing or new builders kerb

Special kerbs can be designed to convert a fixed to an opening unit. Drawings show standard dimensions, other dimensions are available upon request.

### **Opening frame**

A tubular steel opening frame in galvanised steel is hinged to one side of the kerb. The amount of opening is dependent upon the type of unit and opening mechanism.

### **Glazing**

To conform to UK Building Regulations for fire resistance and thermal performance, glazing can be double- or triple-wall polycarbonate domes or pyramids, or structured multi-wall curved

polycarbonate sheet. For applications where natural daylighting is not required insulated aluminium covers are available. Other options are available for those situations where the Building Regulations do not apply.

### **Beading Frame**

An aluminium beading frame holds the glazing in place and protects edges from lateral impact. This is secured by stainless steel screws and washers. Anti vandal screws can be provided to order.

### **Opening mechanism**

A wide variety of opening and closing mechanisms are available. Access units have a simple mechanical catch and opening units for ventilation only are controlled by a simple mechanical catch, a continuous worm screw or electric cylinder motor. In addition to a heat sensitive thermo-fusible link, smoke and fire vents can be controlled by a mechanical or electromagnetic catch. If units are required to be remotely opened and closed then control is via a cable and winch mechanism (mechanical or electromagnetic) or an electric motor.

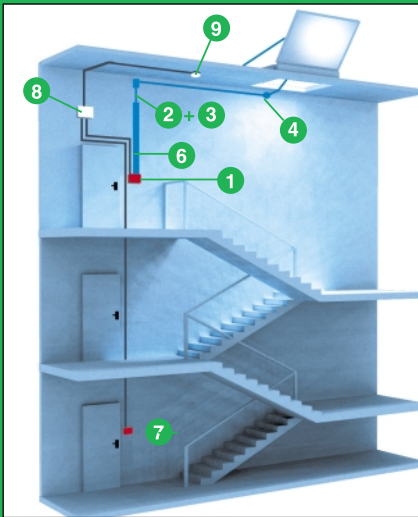


# ROOFLIGHTS – Product Range

## ARCAFACADE



- Natural smoke evacuation, ventilation, natural daylighting
- Louvered system – laminated or wired glass, structured polycarbonate aluminium
- Electric, pneumatic or manual control
- Pre-assembled ready for direct installation
- Suitable for facades between 60° and 90°

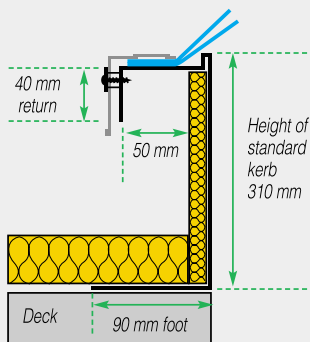
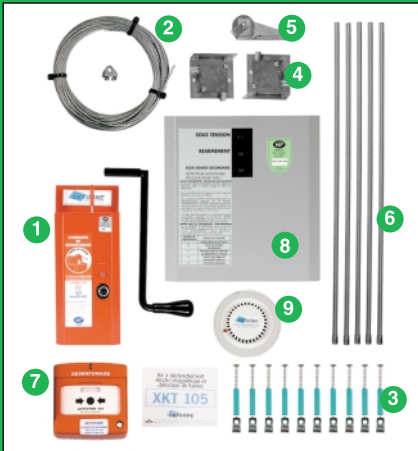


### Top: Control Mechanism

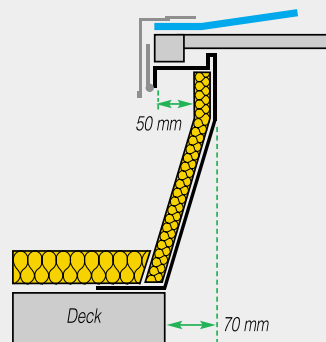
The drawing shows a typical installation of an electromagnetically controlled PYRODOME in a protected stairwell. The electromagnetic winch and smoke detector are installed at the highest level with a break glass repeater on the ground floor. To reduce the risk from vandalism the winch mechanism can be protected within a steel box.

### Bottom: Components of electro-magnetically operated control and smoke detection mechanism

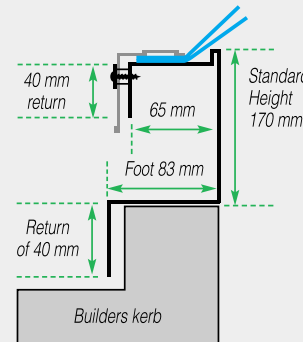
- 1) 1 electro-magnetic winch NF 24V rupture
  - 2) 15 lm of cable
  - 3) 1 cable clamp
  - 4) 2 pulleys and guards
  - 5) 1 offset pulley
  - 6) 2.5 lm of protective cable sleeve
  - 7) 1 break glass box
  - 8) 1 smoke detector with battery
  - 9) 1 detector head
- Screws



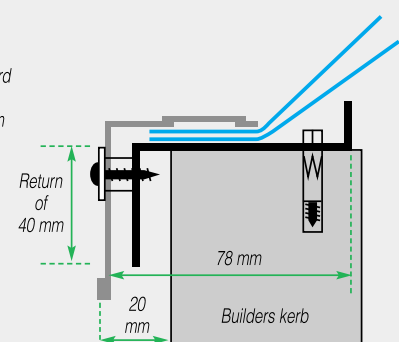
Full kerb



Tapered kerb



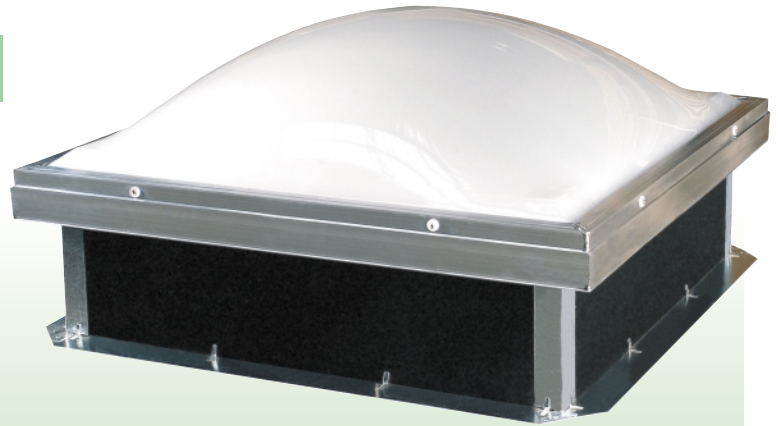
Adapter plate



Z frame

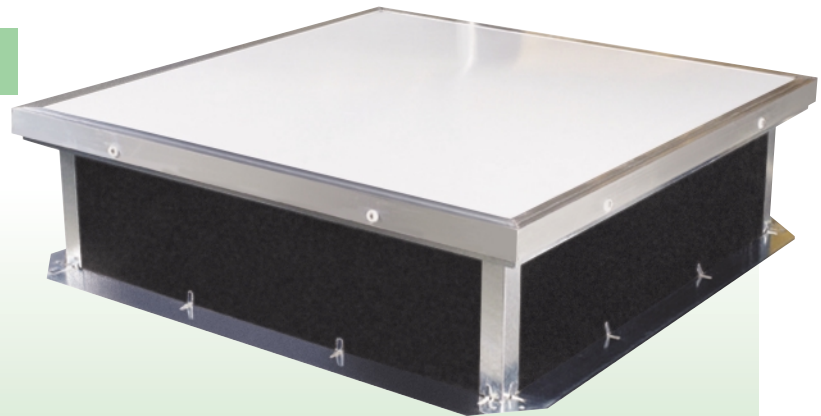
## HYDOME

- Natural daylighting
- Full kerb adapter plate or Z-frame for use on new or existing builders kerb
- Permanent ventilation option



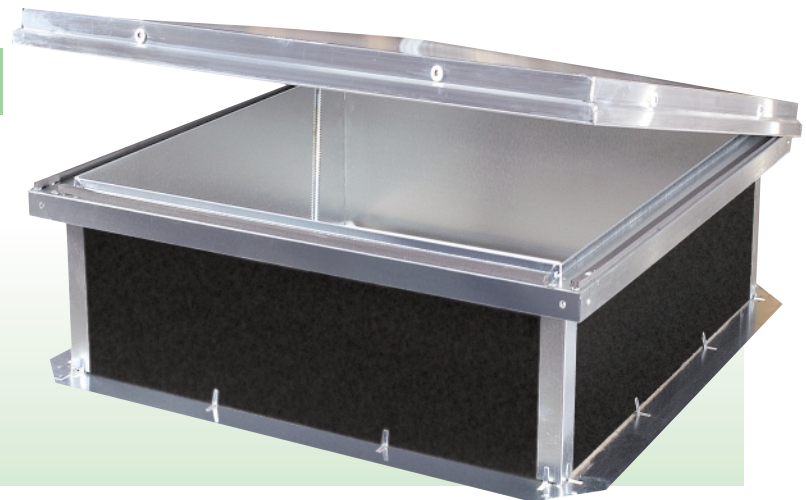
## SKYCLAIR

- Natural daylighting
- Full kerb adapter plate or Z-frame for use on new or existing builders kerb
- Permanent ventilation option



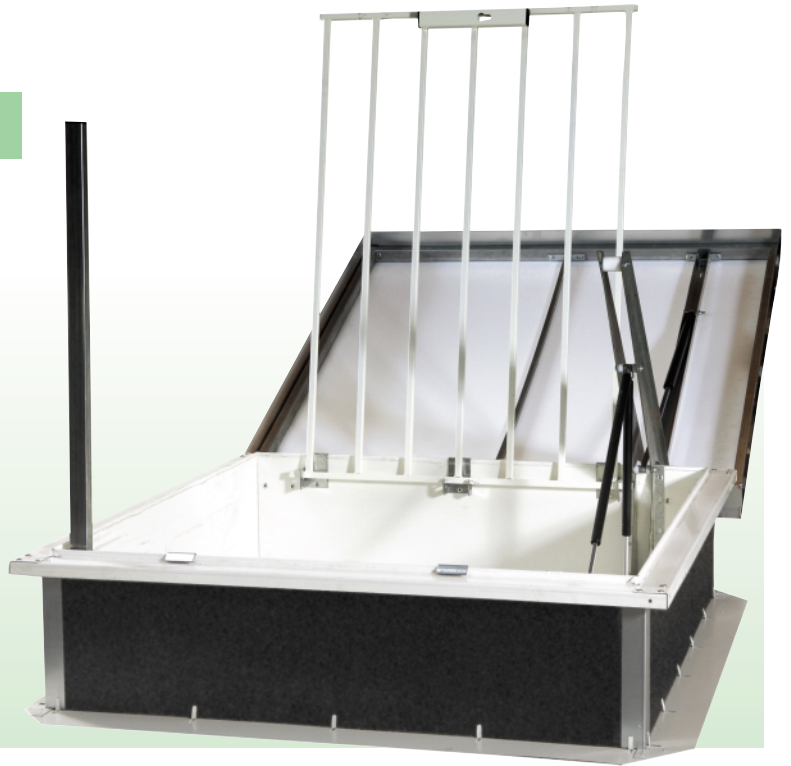
## AIRDOME

- Ventilation and natural daylighting
- Full kerb or adapter plate to sit on a new or existing builders kerb
- Control mechanism – manual (worm screw), electric (220 volts) motor, pneumatic (connected to existing pneumatic line)
- Opening to 250 or 300 mm depending upon control mechanism



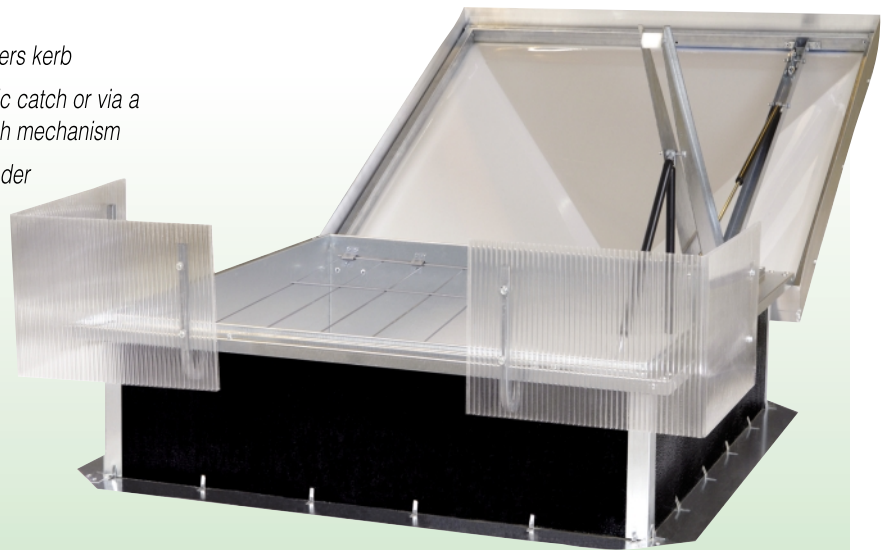
## PYROPASS

- Roof access, smoke evacuation, natural daylighting and ventilation
- Full kerb or adapter plate to sit on new or existing builders kerb
- Designed for protected stairwells combining attributes of PASSADOME and PYRODOME
- Includes painted opening grill to 1200 joules, a retractable handle and ladder access bar
- Control can be by a simple mechanical or electromagnetic catch or via a mechanical or electromagnetic controlled cable and winch mechanism
- Opening assisted by gas strut



## PYRODOME

- Smoke evacuation, ventilation and natural daylighting
- Full kerb or adapter plate to sit on a new or existing builders kerb
- Control can be by a simple mechanical or electromagnetic catch or via a mechanical or electromagnetic controlled cable and winch mechanism
- Alternatively operation can be via an electric (220 v) cylinder
- Angled kerbs are available to assist smoke evacuation
- All units include a heat activated thermo-fusible link as added security
- Opening assisted by gas strut (not on electric version)



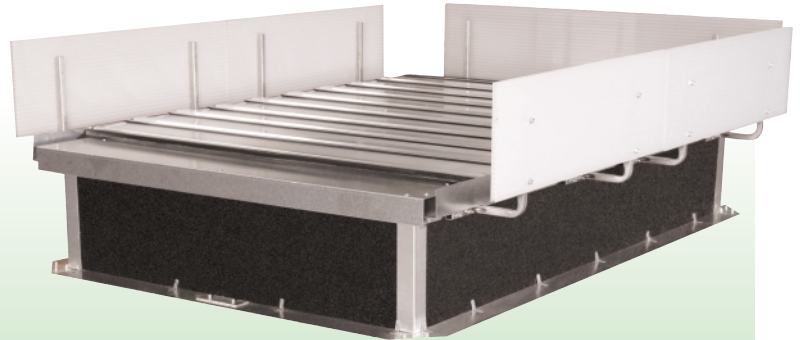
## PASSADOME

- Roof access and natural daylighting
- Full kerb or adapter plate to sit on a new or existing builders kerb
- Opening assisted by gas strut
- Chain restricting opening to 60°



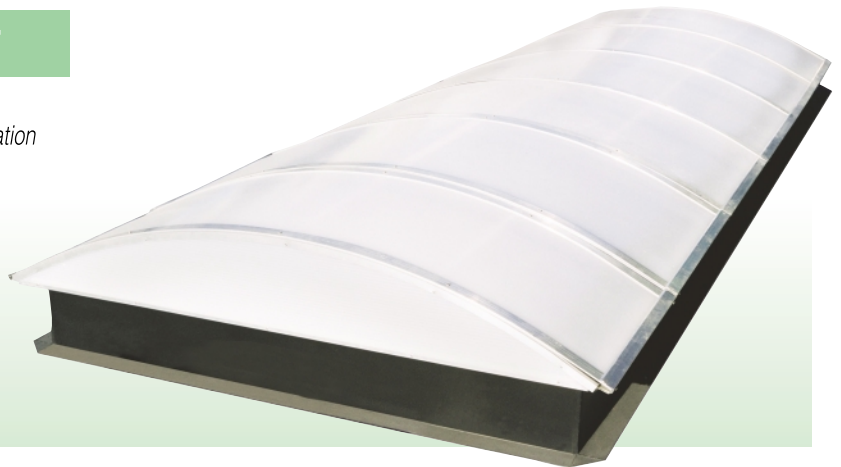
## ARCALAM

- Natural smoke evacuation, ventilation, natural daylighting
- Louvered system – laminated or wired glass, structured polycarbonate or opaque aluminium
- Adaptable for multiple use: flat roofs, tiled or slate roofs, metal profile sheeted roofs, or glass roofs with slope from 5 to 60°
- Wide choice of louvres
- Electric or pneumatic control



## VOUTE CONTINUOUS ROOFLIGHT

- Natural daylighting or additionally smoke evacuation or ventilation with the inclusion of one or more ARCALAM units
- Multiwall structured polycarbonate covers
- Curvature 1 / 5th width or semi circular
- Supplied in kits for easy installation



## Table of covers

| Glazing Performance            | U-value<br>(W / m <sup>2</sup> °C) | Type            | Light<br>Transmission % | Fire<br>Classification | Acoustic<br>db(A) |
|--------------------------------|------------------------------------|-----------------|-------------------------|------------------------|-------------------|
| Double dome polycarbonate      | 3.1                                | Transp. or opal | 76                      | Tp(a)                  | 19                |
| Triple dome polycarbonate      |                                    | Transp. or opal |                         | Tp(a)                  |                   |
| Structured polycarbonate 16 mm | 2.3                                | Transp. 3 wall  | 79                      | Tp(a)                  | 21                |
| Structured polycarbonate 16 mm | 2.3                                | Opal 3 wall     | 57                      | Tp(a)                  | 21                |
| Structured polycarbonate 16 mm | 1.73                               | Transp. 7 wall  | 64                      | Tp(a)                  | >21               |
| Structured polycarbonate 16 mm | 1.73                               | Opal 7 wall     | 54                      | Tp(a)                  | >21               |
| Aluminium 10 mm                | 3.0                                | Solid           | –                       |                        | 17                |
| Aluminium 60 mm                | 0.6                                | Solid           | –                       |                        | 24                |

### Axter smoke evacuation units ventilation performance <sup>(1)</sup>

| Opening<br>cm x cm       | Av (geometric surface)<br>m <sup>2</sup> |              | Aa (opening surface)<br>Straight kerb HT 310 mm in m <sup>2</sup> |              | Aa (opening surface)<br>Adapter plate HT 170 mm in m <sup>2</sup> |                |
|--------------------------|--|--------------|---|--------------|---|----------------|
|                          | Evolution                                | Evolution XL | Evolution   | Evolution XL | Straight profile  | Angled profile |
| 100 x 100 <sup>(2)</sup> | 1.00                                     | 1.30         | 0.68  | 0.87         | 0.63  | 0.68           |
| 120 x 120 <sup>(2)</sup> | 1.44                                     | 1.80         | 0.96  | 1.20         | 0.91  | 0.97           |
| 140 x 140                | 1.96                                     | 2.37         | 1.28  | 1.60         | 1.22  | 1.30           |
| 150 x 150                | 2.25                                     | 2.69         | 1.45  | 1.82         | 1.40  | 1.48           |
| 160 x 160                | 2.56                                     | 3.03         | 1.63  | 2.05         | 1.59  | 1.67           |
| 100 x 150                | 1.50                                     | 1.87         | 1.00  | 1.25         | 0.94  | 1.01           |
| 100 x 200                | 2.00                                     | 2.44         | 1.33  | 1.64         | 1.25  | 1.33           |
| 120 x 200                | 2.40                                     | 2.87         | 1.59  | 1.95         | 1.49  | 1.57           |
| 140 x 200                | 2.80                                     | 3.30         | 1.85  | 2.24         | 1.74  | 1.83           |

Tested in accordance with BS EN 12101 - 2 <sup>(1)</sup> Does not include figures for ARCALAM or ARCAFACADE – these are available upon request. <sup>(2)</sup> Side fixed mechanism – Value with deflectors installed

### OPTIONS

**Permanent ventilation** – Permanent, trickle ventilation, available to order on all units to control condensation, is provided by an 8 mm gap between the beading frame and the kerb. On a 1.2 m x 1.2 m unit this will provide a total ventilation area of 384 cm<sup>2</sup>.

**Anti fall or anti intruder grills** – Permanent or lockable opening grills are available to arrest falls or intruders.

**Paint finishes** – Kerbs can be post painted in any RAL colour.

**Insulation** – Different thicknesses of insulation can be ordered to enhance U-values.

**Dimensions** – See individual data sheets for geometric and free air dimensions.

Axter also specialises in the design and manufacture of **flexible membranes for roofing, structural waterproofing systems, green roofs and geomembranes.**

Further details on the above and the specifications contained in this document can be obtained from Axter Ltd.



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