Rooflighting Best Practice
Quickguide 04

National Association of Rooflight Manufacturers

Designing with daylight - notes for specifiers

Daylight is a vital natural resource that will significantly improve the environment within any building. Rooflights provide three times more light than the same area of vertical glazing. They can also provide a much more even distribution of light, particularly in larger structures. Where vertical glazing exists, the effective area for natural lighting will only be within 6m of the wall containing the window.

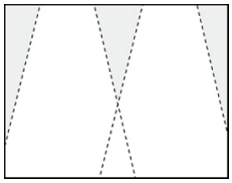
These facts are well understood by most people involved in building design. However the huge potential of rooflights to provide exactly the amount, type and distribution of natural light required to meet any given specification is not always appreciated. Rooflights can help to provide natural light with qualities appropriate to the use of the building.

Types of light

Rooflights are not only the most effective way of allowing natural light into a building, they can also determine the type and amount of light entering the building.

Direct light

As the name suggests, direct light passes through the rooflight without any disruption or interference, entering the structure as a straight beam. It therefore gives strong light in a given area but less general light in the surrounding area. It is useful where strong light is required in an area for close detailed work such as painting, or in situations where a very natural environment is desired, or the designer wants people in the building to see the sky through the roof. Direct light will result in shadows and glare on sunnier days.
Polycarbonate, PVC and glass in clear and most tinted options provide direct light.



Diffused Light

As the light passes through the rooflight it is scattered giving a much more even distribution of light into the structure below. It is useful when the requirement is for ambient lighting over a large area with minimal shadows. Most industrial, commercial and sporting facilities prefer diffused light for these qualities.
GRP in all forms, Polycarbonate, PVC, and Glass in patterned and opal tinted forms provide diffused light.

If a material providing direct light and one providing diffused light into the building have the same light transmission, they will let the same amount of light into the building, it is simply distributed differently.

Amount of Light

Different materials and different tints of materials provide varying amounts of light into the building. In clear format most single skin rooflight materials will have a light transmission of 80%-90%. This must however be checked for the specific rooflight being used; material thickness, diffusing or colour tints, and number of skins can all affect overall light transmission.

In some situations the amount of light entering the building needs to be controlled, usually to prevent overheating. Tinted materials will limit the light entering the building. It is impossible to give a general guide to the light transmission achieved through the various tinted options available, as these vary not only from material to material but also from manufacturer to manufacturer.

Rooflight areas

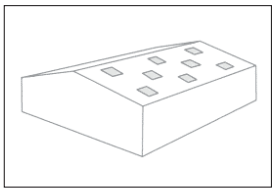
It is important that designers consider building usage and possible future change of use, when determining rooflight area.
A rooflight area of 15% - 20% will provide adequate natural light for most buildings. However, other factors must be taken into consideration, such as thermal performance.

Designing with daylight – notes for specifiers
Quickguide 04

Independent research has shown that rooflight areas of 15% to 20% will have a positive impact on reducing energy consumption and emissions to aid compliance with Part L of The Building Regulations. Further information in this respect can be accessed on the 'Energy Consumption' page of this website.

Rooflight Configuration

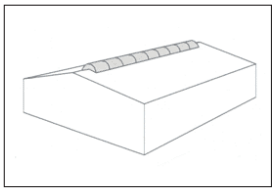
The factors to consider when designing the rooflight configuration are:
Is there sufficient general lighting to create a pleasant and suitable internal environment?
Is there a requirement for increased or controlled light levels in specific areas of the building e.g. play area in a sports hall?
The relationship between the height of the building and the diffusing quality of the rooflights to provide good general light at ground level.
Degree of roof maintenance and roof access envisaged.
Weatherability and minimising laps, especially between dissimilar materials.
There are a number of possible configurations for the rooflights.



Chequerboard Rooflights

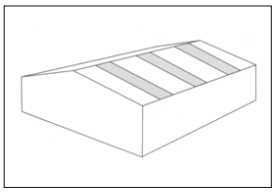
This allows for individual rooflight units, both in plane and out of plane, and provides the most uniform distribution of light. The rooflight is fixed to the metal cladding or roof deck on all four sides and is therefore well supported.

This design has the maximum number of end laps or flashings and therefore requires the maximum attention to the sealing details by the roofing contactor with resultant increased costs.



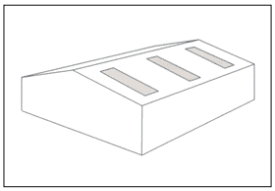
Ridge Lights

Using a barrel vault or pitched rooflight along the ridge can provide an aesthetically pleasing design and a relatively uniform distribution of light only if the roof slope is short. The major advantage over the chequerboard arrangement is that they reduce the number of metal/translucent junctions to be fixed and sealed. However, at the ridge they are subject to high wind loads. Since it is recommended that rooflights should not be walked on at any time, where roof access is expected and frequent, ridge lighting provides a safer option.



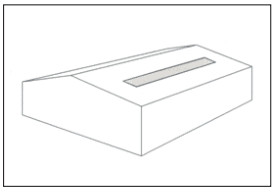
Ridge to Eaves

Both profiled and barrel rooflights can be fixed from ridge to eaves or from ridge downslope. They minimise the number of metal/translucent junctions and could eliminate rooflight end laps, thereby improving reliability and servicing. However, since the rooflight industry does not recommend walking on rooflights at any time, a ridge to eaves layout will limit access across the roof.



Mid Slope Rooflights

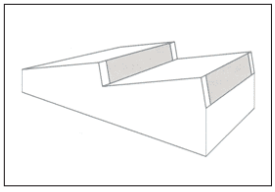
This configuration is only possible with rooflights which match the roof profile. It provides a compromise between chequerboard and ridge to eaves in terms of light distribution and buildability. It avoids all areas with high wind uplift and allows general roof access if the metal roof is suitable for walking on. This design is now very popular on new build work.



Continuous Run

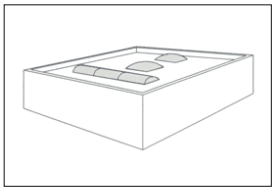
Good levels of lighting can be achieved with this design but it is less frequently used on modern designs. With GRP in-plane rooflighhts, care needs to be given to manufacturing and fitting tolerances of the metal sheets and rooflights to avoid a build up of tolerance difference.

Replacing old reinforced glass fixed in T bars with modern profiled rooflights or panel systems is common practice and very effective.



North Lights

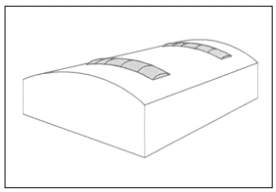
This configuration could be viewed as a continuous run as above but is not subject to tolerance difference between metal sheets and rooflights. North lights on new build is no longer common practice but refurbishment with modern rooflights or panel systems is easily achieved.



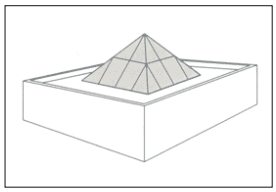
Random Design on Flat Roofs

Used on flat or low pitch roofs, the rooflights are placed according to need and roof design on purpose designed upstands.

Designing with daylight – notes for specifiers
Quickguide 04



Curved Roof
Placed on an upstand that curves to the roof, flat or barrel vault rooflights can be applied to run over the crown of the roof and stopping either mid slope or down to the eaves. Ideal for metal standing seam system roofs and single ply membranes.



Structural Glazing
Bespoke structures of almost any shape and design, normally constructed from aluminium or steel sections and glazed with polycarbonate or glass units of varying specifications. These custom built structures are generally detailed by the rooflight manufacturer to an architects brief and allow immense freedom of design.

Further information
Further information can be obtained from NARM, (National Association of Rooflight Manufacturers) at **www.narm.org.uk**

National Association of Rooflight Manufacturers