Whitesales Rooflights

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CPD Article

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Specification for ‘Non-Fragile’ and ‘Walk-On’ Rooflights

In construction, rooflights provide an invaluable source of daylight, for structures which may otherwise have low levels of natural illumination. Each category of rooflight has a distinct classification, in terms of fragility, loading level, installation method and surface coating. Understanding the characteristics and criteria of the various rooflight options is critical to ensuring a compliant and appropriate selection.

Key Learning outcomes

- Understand non-fragility classification criteria
- Recognise the different classification levels of non-fragility
- Understand rooflight application specifications
- Identify the different installation methods relevant to rooflight categories
- Understand different surface coatings on walk-on units, in the context of slip ratings

1.0 Understanding non-fragility classification criteria

The term ‘non-fragile’ indicates that the surface of the rooflight is durable, resilient, and suitable for walking upon. However, this is misleading, as non-fragile ratings apply to a broad range of rooflights, each with significant variation in terms of their resistance to impact.

Non-fragile classifications can be applied to polycarbonate, glass and GPR rooflights. However, there are a number of circumstances affecting impact resilience within this category, including the installation method used, and the coating applied to the surface.

The non-fragile classification is applied to rooflights which are considered resistant to impacts from falling objects (or people), and maintain an equivalent level of impact resistance to that maintained across the surface of the roof overall.

Despite the initial non-fragile classification ascribed to a particular rooflight, it’s important to recognise that certain scenarios may affect the level of impact resistance over time. A rooflight which suffers an apparently inconsequential scratch may be subject to UV damage over time, which weakens the fixture and affects resistance to subsequent impact. As a result, it is best practice to consider all rooflights to be fragile, unless they have been recently assessed as otherwise.

Rooflights with a non-fragile classification are assessed according to the roof loading capacity, as opposed to floor loadings; as a result, even non-fragile rooflight fixtures are not recommended to be walked upon. New rooflight installations should always be designed as non-fragile, and be installed using specified components and approved methodology, to maximise the longevity of the non-fragile classification.

CWCT testing for rooflights identifies a rating (Class 1, 2 or 3), according to performance under a standardised assessment. A specified weight is released in a controlled fall under gravity, at critical points, to monitor impact resistance. Class 1 is categorised as suitable to walk on for brief maintenance or cleaning. Class 2 is unsuitable for walking upon, but resistant to breakage in the event of surface impact. Class 3 is a ‘fragile’ classification, requiring additional safety considerations.

CWCT provides guidance for appropriate installation of rooflights. The TN66 Technical Note relates to glass roofing which is not publicly accessible, but may be accessed for maintenance purposes. TN67 outlines the required assessment process to ensure glass roofs are compliant with CWCT classifications. TN92 details the criteria required, for glass used in Class 2 roofs, to achieve a ‘deemed to satisfy’ rating.

CWCT testing requires the outer pane to be broken and the test weight supported only on the inner pane for a successful pass.

2.0 Loading levels for walk-on rooflights

Rooflights classified as ‘walk-on’ are subject to their own distinct loading levels, applicable depending upon their proposed application. CWCT Class 0 refers to rooflights with unrestricted access, which are designed to be walked upon. Loading levels are not calculated purely on the basis of capacity to withstand being walked upon, but also consider other factors which may cause additional pressure impacting load bearings, such as wind or snow loading. These additional factors are measured through test methods outlined within BS EN 12211 guidance.

Domestic applications for rooflights require a uniformly distributed load capacity of up to 1.5 kN/m2, and concentrated load capacity of up to 2.0 kN/m2. Commercial application requires load capacity of up to 4.0/3.6 kN/m2, and heavy-duty requires up to 5.0/4.5 kN/m2.

Correct applications and installation methods for walk-on/non-fragile rooflights.

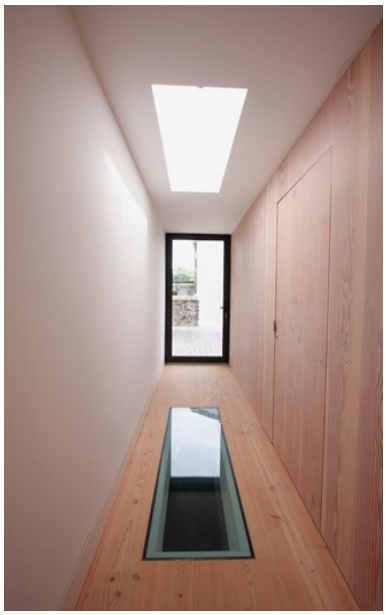
3.0 Correct applications and installation methods for walk-on/non-fragile rooflights

It stands to reason that walk-on rooflights should always be installed flush with the roof surface, to prevent additional risk of slip hazards. Walk-on rooflights which are designed to floor loadings are generally installed in-plane with the surrounding flooring, to provide a translucent panel which enables transmission of light to the internal areas beneath. Similarly, non-fragile rooflights should always be installed above the plane of the roof, to minimise the risk of them being inadvertently stepped on.

When it comes to compliant installation, the following guidance informs the ideal approach:

- Measure the aperture for squareness
- Check the level across the aperture
- Shim and pack the frame as appropriate
- Never underestimate the importance of visual checks
- Ensure that the frame is not distorted when fixing into the structural support.

Regulations specify that new rooflights cannot project more than 150mm from the existing roof plane, and no alteration must be higher than the existing roof. Side-facing windows must be obscure glazed, with any opening to be made 1.7m above the floor. Even low-profile rooflights require an upstand to provide a safe surface for fixing to. In structures where the rooflight will project further than the permitted 150mm (for example, when installing on a pitch), planning permission is required.



Bespoke framework and flashings are available to provide either flush installations for internal use, or raised installations for external use where there is paving or decking surrounding the rooflight.

4.0 Surface coatings and slip ratings for walk-on units

When it comes to addressing the relative slip rating for glass on walk-on rooflights, different surface coatings can provide varying degrees of slip reduction. Slip resistance rates should be tested in both wet and dry conditions, to ensure values are accurate. testing should be carried out in both wet and dry conditions to get a true measure of the slip resistance of the surface. The most common manner for calculating slip ratings is the Pendulum Test Method, which provides a Pendulum Test Value (PTV). Walk-on units require a PTV of over 36 in both wet and dry conditions.

A PTV of 0-24 has a high slip resistance, 25-35 is a moderate slip resistance, 36+ is a low slip resistance and 75+ is an extremely low slip resistance. Surface coatings such as sandblasted and etched finishes assist in elevating slip resistance, whilst also affording additional privacy.

A full sandblasted finish to a structural glass floor will generally achieve a PTV of 57 in wet conditions for an acceptable anti slip finish to the walk on glass. Other sandblasted patterns will need to be tested on site for an accurate PTV. Fully-sandblasted surfaces attain a PTV of 50, significantly reducing slip hazard risks. When the surface of the glass is etched to create a raised pattern, the surface can achieve a PTV of between 18 to 57.
A further option for achieving an enhanced degree of slip reduction is through ceramic fritting. This method involves baking ceramic into the uppermost surface of the glass, until it is structurally bound. It is hard-wearing, and a complete ceramic frit can provide a PTV of 60, without impacting transparency levels.

Sandblast coatings to face one of a walk-on rooflight provide a dual purpose with high anti-slip rating and privacy factor.