

Understanding the differences between 'non-fragile' rooflights and 'walk-on' rooflights for deliberate foot traffic



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Introduction

Non-fragility of rooflights is a complex subject which can be influenced by many different factors, including material selection, design and the competence of the installer. For this reason, over the years, NARM has advocated that whatever the non-fragility rating or age of a rooflight, it should be considered as if it may be fragile and foot traffic on rooflights should always be avoided.

This advice does require a caveat, as there is a very specialised class of rooflights which are specifically designed for foot traffic. These are very high specification glass structures designed to floor loadings and installed in-plane with external floors on roof decks and roof terraces where pedestrian access is unrestricted. This type of specialist product has been available for many years, with notable examples providing tourist attractions on towers and other structures. In recent years these ‘walk-on’ rooflights have become more widely used, with many now providing a means by which homeowners are able to improve space utilisation offered by roof areas.

This document has been prepared to clarify confusion resulting from terms used to describe these products, and the hazards that can result from incorrect use of undefined and ambiguous terms such as ‘man-safe’ and ‘walkable’.

What are 'non-fragile' rooflights? ...and where should they be installed?

- The term 'non-fragile' can be applied to a wide range of rooflight types offering varying degrees of durability and impact resistance. Glass, polycarbonate and GRP rooflights can all be supplied with non-fragile classifications.
- A non-fragile rooflight is NOT designed to be walked upon. It is designed to save lives by preventing people or objects falling through it accidentally, when accessing roof areas not designed for regular foot traffic. However, a person or other object falling onto a non-fragile rooflight may cause damage to the rooflight, resulting in it becoming fragile. For example, a seemingly minor scratch may penetrate the UV protecting layer applied to some glazing materials, which in the long term may result in UV damage which can severely affect impact resistance.
- Non-fragile rooflights are designed to meet requirements for roof loadings, NOT floor loadings, which are by necessity much higher.
- Rooflights should be designed to be non-fragile, with the non-fragility classification matching that of the surrounding roof.
- At some point in its existence, any roof assembly (whether or not it includes rooflights) will become fragile. Therefore any existing roof and/or rooflights should always be treated as if it were fragile unless there is clear documented evidence to the contrary.
- All new roofs including rooflight assemblies should initially be designed as non-fragile and clients and their agents need to ensure that specified systems and components are always used and the installation is correctly controlled to create a roof that can be expected to remain non-fragile in the long term.

Read More NARM has published a number of documents covering non-fragility in greater detail:

NARM Technical Document NTD03 - Application of ACR[M]001 'Test For Non-Fragility of Large Element Roofing Assemblies' to GRP Profiled Rooflight Sheeting

NARM Technical Document NTD08 - 'Guidance on non-fragility for specifiers of in-plane rooflights'

NARM Quickguide 01: 'Non-fragility: key points from the Red Book ACR[M]001

These can be downloaded from the NARM website: www.narm.org.uk.

Examples of non-fragile rooflights. These should never be deliberately walked upon.



GRP in-plane rooflights



Multiwall polycarbonate rooflight



Polycarbonate barrel vault rooflight



Flat glass rooflight

Practical recommendations for specification

- The desired non-fragility performance of all roofs and rooflights within a roof, should be specified in accordance with the classifications defined in ACR[M]001, typically Class B non-fragile. This clearly defines the level of performance which the roof and rooflight have to achieve: the method of testing and classification are fully defined within the test standard.
- Use of more generic and ambiguous terms such as ‘man-safe’ (which is a protected trademark for a safety line system and has no meaning in relation to rooflights), ‘walkable’, ‘walk-on’ or ‘traversable’ should always be avoided, except where a specialist glass rooflight designed to floor loadings is required. Such terms are completely undefined, and whilst they may be used with the intention of specifying a higher performance roof, the use of these terms will actually have the opposite effect: since they are undefined, they will result in a lower performance roof.

‘Walk-on’ rooflights designed to floor loadings for deliberate foot traffic

- When specifying a specialist rooflight designed to floor loadings, specifically intended for foot traffic, never use undefined terms like ‘walkable’ or ‘mansafe’. To avoid confusion ensure that any reference to walk-on rooflights is always qualified with the phrase “must be designed to floor loadings”, and for clarity, any written or verbal reference to walk-on rooflights should also be accompanied by the appropriate floor loading specifications.
- Walk-on rooflights which are designed to floor loadings are generally installed in-plane with the surrounding flooring, to provide a transparent or translucent panel allowing light transmission to internal areas below.
- The only suitable material for rooflights designed for deliberate foot traffic is glass. Polycarbonate or GRP glazing can NEVER be specified for applications designed for deliberate foot traffic.
- Whilst non-fragile glass rooflights often have outer panes which are 4 or 6mm toughened glass, the specification of specialist rooflights designed to meet floor loadings is completely different.
- Glass in the outer pane must be both toughened and laminated, and must be specifically designed for the pane size and method of support. The outer pane will usually comprise 3 leaves laminated together, sometimes with an additional sacrificial annealed leaf on the outer surface, typically giving a total thickness of 30-40mm for the outer pane alone.
- Note that this results in an extremely heavy product, weighing typically between 95 kg/m² and 110 kg/m², which must be correctly supported – and would not be suitable for many roof structures.

- Typical load capacities for walk-on rooflights, dependent on the building type and specific use, are:

Domestic applications

Uniformly distributed load (UDL) up to 1.5 kN/m²

Concentrated load up to 2.0 kN

Commercial applications

Uniformly distributed load (UDL) up to 4.0 kN/m²

Concentrated load up to 3.6 kN

Heavy duty commercial applications

Uniformly distributed load (UDL) up to 5.0 kN/m²

Concentrated load up to 4.5 kN

- Areas of glazed flooring have a direct correlation with load capacity. Manufacturers state maximum pane sizes relative to load capacities. For larger glazed areas, support structures will be required. Glazed flooring is significantly heavier than even the highest specification rooflights.

General guidance for safety on roofs

The increasing popularity of walk-on rooflights, brings with it a requirement for clearer communication and clarification of misunderstandings which could lead to inappropriate specification – or worse: the risk of death or injury caused by falling through a rooflight which was mistakenly considered to be suitable for foot traffic.

- Request specific evidence for any non-fragility claims (e.g. a detailed test report, signed by a competent person, or compliance with NARM Technical Document NTD03) and ensure this covers the application/assembly in which the product is to be used: do not rely on general statements.
- Remember that the method of fixing is critical - always ensure rooflights are fixed as recommended and tested. A poorly installed rooflight is potentially as much of a hazard as an incorrectly specified product, and either may be fragile.
- Never under any circumstances walk on a rooflight that is out of plane with the surrounding roof area.
- Never under any circumstances walk on rooflight (in-plane or out-of-plane) that is on a roof area to which access is only allowed for maintenance by trained personnel.

NOTE: This guidance has been issued in 2017 following consultation between NARM member companies. Please be aware that NARM member companies will make every effort to use terminology as referenced in this document. However, they cannot be held responsible for terminology used in any existing publications which have been produced prior to the issue of this document.

Examples of walk-on rooflights designed to floor loadings



Internal walk-on rooflight



Garden area with walk-on rooflight over basement



Private balcony



Roof terrace area

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NARM
National Association of
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Email: info@narm.org.uk
www.narm.org.uk



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