

Technical Note No. 92

Simplified method for assessing glazing in Class 2 roofs



This Technical Note gives a simplified approach to the selection and testing of glass for use in Class 2 roofs for some rooflight configurations.

This Technical Note should be read in conjunction with:

TN 65 Thermal fracture of glass

TN 66 Safety and fragility of overhead glazing: guidance on specification

TN 67 Safety and fragility of overhead glazing: testing and assessment

Introduction

This Technical Note gives a simplified approach to the selection and testing of glass for use in Class 2 roofs. It is limited to consideration of the effects of impact on the glass and assumes that any glass used has also been designed to carry static design loads. It is not applicable to the use of plastic glazing materials.

There are four Classes of roof as described in Table 1. A more detailed description of roof types and requirements for the impact performance of the glazing are given in Technical Note TN66 and a method of test is given in Technical Note TN67.

A deemed to satisfy solution for the glazing is given in this Technical Note but more economical solutions may be available if proven by testing.

A simplified approach to testing is given which is applicable when the only concerns are preventing falls from height through roofs and preventing glass from falling.

Background

Technical Notes TN66 and TN67 cover both safety from falls through glazed roofs and roofing elements and also robustness of roof glazing.

Class	Description	Guidance
Class 0	Roofs designed for unrestricted access	Out of scope of TN66 and TN67
Class 1	Roofs which will be walked on for occasional cleaning/maintenance activities and which will therefore need to support both the weight of people on the glass and their equipment.	Refer to TN66 and TN67
Class 2	Roofs where people are not intended to walk on the glass, but which are required to be non-fragile to protect people in the following circumstances: <ul style="list-style-type: none">• Where maintenance personnel walking adjacent to the glass roof could trip or fall onto the glass surface.• Where maintenance personnel working on the glass roof could fall onto the glass surface from crawler boards or other access equipment.	Either refer to TN66 and TN67, or Refer to TN66 and follow the guidance in this Technical Note
Class 3	Roofs which are fragile.	N/A

Table 1 Summary of Classes of roof given in TN66

Safety: Is concerned with preventing falls from height through the glass and preventing glass from falling. This sets a minimum performance for the lower pane of glass.

Robustness: Is concerned with damage to glass as a result of impact. This sets the performance requirements for the upper pane of glass.

Safety requirements

To meet the safety requirements of TN66, the lower pane of a Class 2 roof should satisfy the criteria set out in Technical Notes 66 and 67. This may be done by either

- Carrying out a test in accordance with TN 67
- Using glass complying with Table 2 within the limitations given in this Technical Note.

For a Class 2 roof with four edge supported panes continuously supported in a rebated frame with an edge cover of at least 15mm, previous tests and experience within the industry indicate that the glasses given in Table 2 will satisfy the requirements of TN 66 and 67.

9.5mm laminate comprising 2x4mm plies of heat strengthened or annealed glass and a 1.5mm interlayer of pvb or ionomer	
Width ≤900 mm	Length ≤ 3.0 m
Width ≤1100 mm	Area ≤ 2.5 m ²

11.5mm laminate comprising 2x5mm plies of heat strengthened or annealed glass and a 1.5mm ionomer interlayer	
Any width/length	Area ≤4.5 m ²

Table 2 Deemed to satisfy glazing for Class 2 roof

The glass types and sizes given in Table 2 are applicable where the glass will be subject to temperatures of up to 40°C. Where higher temperatures may be experienced, the interlayer may soften such that the broken glass cannot satisfy the static load test in TN67.

The glazing must be supported by a framing system that has been demonstrated to be able to resist the design loads and the impacts specified in TN 67.

The required edge cover should be measured to the edge of the structural frame not the edge of the gaskets.

Other support conditions such as point supports and two edge support require testing and may require a more robust glazing solution.

A more economical solution may be shown to work if the glass is bonded to the frame or the opening is considerably smaller than 2.5m².

A manufacturer producing roof elements such as rooflights may justify the cost of testing to establish an acceptable glazing solution for a particular framing solution and range of sizes.

When it is considered necessary to test the glass, the tests specified in TN 67 on the upper pane of a glazing unit can be omitted for a class 2 roof where there is no robustness requirement. The lower pane may then be assessed by conducting only steps 3b, 4, 5, 7, 8, 9 and 10 of the testing regime given in TN67. These tests should be carried out on the lower pane of a glazing unit not a single pane of glass because the single pane of glass may behave differently in the static load test. Note that a static load of 90kg is acceptable for openings up to 1.1m wide.

Testing a square pane of the largest area to be used will be sufficient to validate the use of panes of smaller area where the retention system is continuous along the edges of the pane. For point fixed applications the location and number of fixing points will need to be taken into consideration.

In all cases, a competent person should assess the application, as described in TN 66 and 67, to ensure that there are no exceptional conditions that are likely to affect the safety of the glazing.

Robustness requirements

For a Class 2 roof, robustness is not required by TN66 and the upper pane of a glazing unit is allowed to break under impact provided a lower pane is present to retain the impactor and broken upper pane.

The need for robustness and hence the choice of glass for the upper pane of a glazing unit will depend on:

- The initial cost of the glass
- The likelihood of damage
- The cost of replacement
- Ease of access to the broken glass
- Safety issues associated with any necessary repairs

Where robustness is required, the requirements of TN66 would normally be satisfied by a pane of 10mm toughened glass for pane sizes up to an area of 4.5 m². Note that toughened glass with a frit may give lower performance.

Impact testing of a particular size of glass should not be taken as an indicator of the performance of that glass at a different size (smaller or larger).

References

CWCT TN66 Safety and fragility of overhead glazing: guidance on specification

CWCT TN67 Safety and fragility of overhead glazing: testing and assessment

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University of Bath, Claverton Down, Bath, BA2 7AY
Tel: 01225 386541; Fax: 01225 386556
Email: cwct@bath.ac.uk;
www.cwct.co.uk