# TB451

## Brightside Skylights Glass Rooflight Inner Panes Datasheet

### Introduction

Some Brightside Skylights glass rooflights are offered with either a toughened inner pane, or an optional annealed laminated inner pane as recommended by the Rooflight Association. This document provides a summary of the differences and considerations that should be made when choosing between these options.

### Safety risk and responsibilities

British Standards set out the circumstances and locations when a toughened inner pane can be used, subject to satisfactory risk assessment. The Rooflight Association recommends that the inner pane should always be laminated glass, unless a stringent risk assessment has been undertaken which shows that use of a toughened glass inner pane does not give any additional risk to those below rooflights. For further information please see Rooflight Association NTD14.

By choosing a rooflight with a toughened inner pane, customers acknowledge and accept responsibility for the associated risks, including the need to carry out a satisfactory risk assessment, and are responsible for ensuring a rooflight with toughened inner pane is appropriate for the intended application, which is beyond the control of the rooflight manufacturer.

### Annealed laminated glass inner pane

- Formed from two piles of annealed glass (the initial product produced in glass making) which are bonded together by an interlayer which is most commonly polyvinyl butyral (PVB).
- When broken, it produces large shards of glass which are held by the interlayer, preventing injury to those immediately below the rooflight.
- Required for any rooflights classified as non-fragile, however a laminated inner pane does not automatically mean the rooflight is non-fragile as this must be proven via test.
- Blocks up to 99% of UV rays, helping to protect internal finishes from fading.
- Higher level of noise reduction than toughened glass, helping to reduce the effect of intrusive external noise.
- Less resistant to impact damage than toughened glass, so can be more easily damaged during transportation, installation, and from projectiles post installation.
- In some circumstances, annealed, laminated glass can be subject to thermal stress fracture in the event of uneven heat build-up directly under the glass. Installation of blinds, or any other alterations made to the lightwell below the rooflight, must be done so with consideration to the risk of thermal stress fracture. In the case of blinds, the risk of thermal stress fracture can never be fully removed, but it can be reduced by choosing light coloured blinds and positioning them as far away from the glass as possible.

### Toughened glass inner pane

- Formed from a single ply of annealed glass that has been ‘toughened’ to increase its strength via a controlled heating and cooling process.
- When broken, it forms small, slightly rounded pieces of glass known as ‘dice’ which are free to fall, but which are less likely to cause injury; hence its classification as a ‘safety glass’. However, on rare occasions, these dice can clump together and fall as larger sections of glass.
- Rooflights incorporating a toughened inner pane should be considered fragile.
- Typically blocks 60-70% of UV rays, so provides less protection to internal finishes from fading than laminated glass.
- Lower level of noise reduction than laminated glass.
- More resistant to impact damage than annealed glass hence why it is typically used for the outer pane of rooflights to protect from hail and other projectiles.
- Due to the presence of nickel sulphide (NiS) inclusions, toughened glass can on rare occasions spontaneously shatter. This risk can be greatly reduced by specifying heat-soaked toughened glass (available on request). Other types of inclusion can also occur in toughened glass and although they do not cause toughened glass to spontaneously shatter, they can weaken the glass increasing the risk of it shattering when subjected to higher stresses.

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**Summary**

| Characteristic | Annealed laminated inner pane | Toughened inner pane |
|---|---|---|
| Overhead Safety | **Better** | Worse |
| Resistance to spontaneous breakage from inclusions | **Better** | Worse |
| UV Protection | **Better** | Worse |
| Noise reduction | **Better** | Worse |
| Resistance to impact | Worse | **Better** |
| Resistance to breakage from thermal stress | Worse | **Better** |

**Other options**

Brightside Skylights is usually able to provide the other inner pane glass specifications below – price and lead time on request. Please note, choosing any of the options below will negate any non-fragile performance.

**Laminated inner pane options**

- **Heat strengthened annealed laminated** – reduces the risk of thermal stress fracture
- **Toughened laminated** - reduces the risk of thermal stress fracture and improves impact resistance
- **Heat soak toughened laminated** – same as toughened laminated, but with reduced risk of spontaneous breakage from nickel sulphide (NiS) inclusions

**Toughened inner pane options**

- **Heat soak toughened** – reduced risk of spontaneous breakage from nickel sulphide (NiS) inclusions