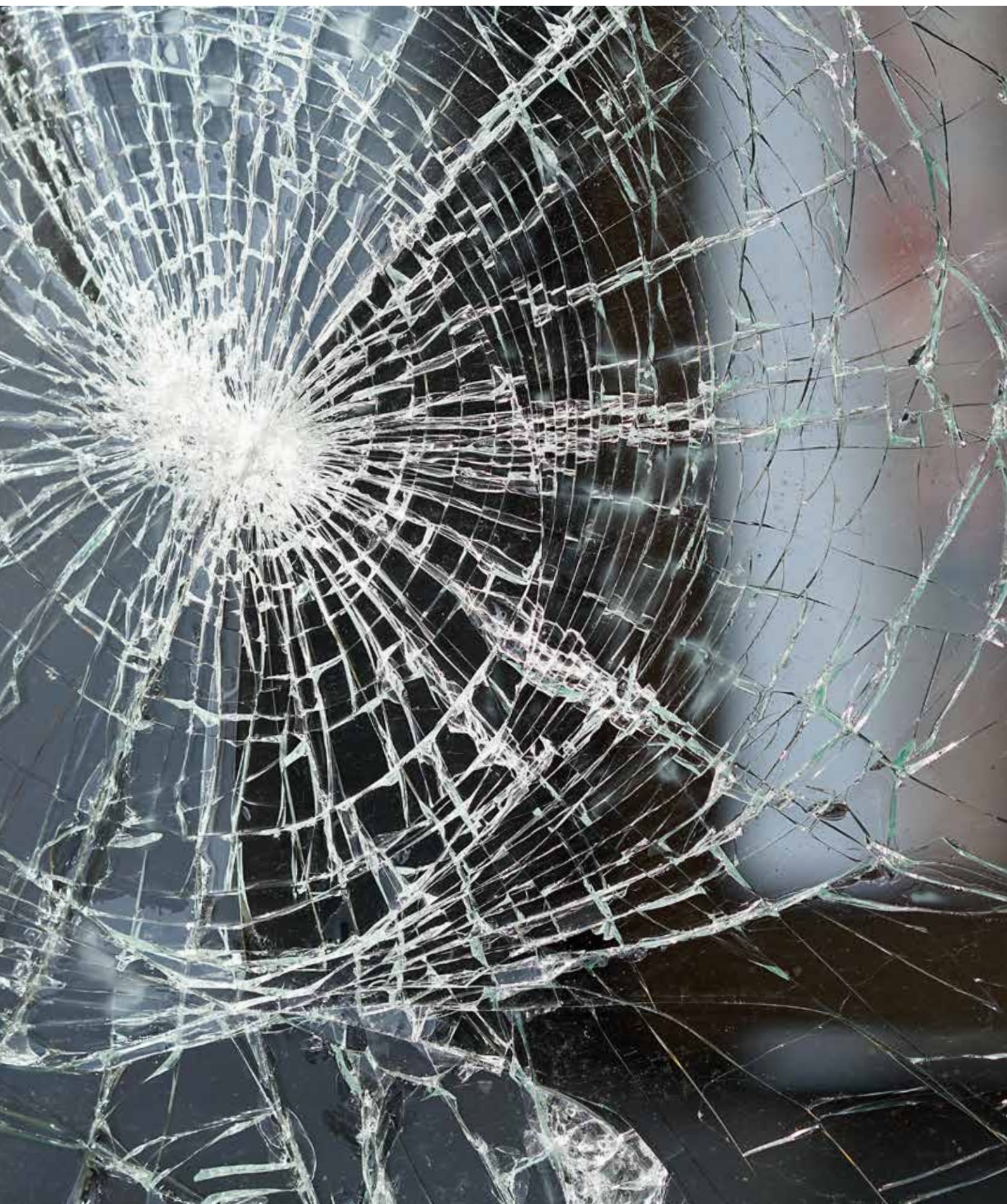


GLASS BREAKAGE

Consumer Guide



Introduction to glass breakages

By its very nature the glass used in buildings is subject to breakage from time to time, it could be the result of accidental or deliberate actions and can also sometimes be for seemingly no obvious reason. This guidance note is intended to provide information for the consumer of glass products in buildings, whether domestic or commercial, about the nature of breakage of commonly used types of glass, possible causes of glass breakage and post-breakage considerations in the event of encountering a glass breakage.

The material properties of glass, and the raw materials it is manufactured from result in a product that we can often take for granted, especially as in most cases it is designed to be an invisible barrier to the elements. Unexpected glass breakage can be a shock but thankfully it is rarely seriously dangerous when the glass used has been supplied and installed in accordance with safety conscious legislation and best practice design principles.

How did it break?

The manner in which the glass breaks will be determined by the type of glass used, its thickness and dimensions, the situation that it's been installed into, and of course the ultimate reason for its untimely fracture. Understanding this ultimate cause usually requires some detective work, but there are some common causes for the different glass types which we can look at in relative ease.

Firstly, it's important to understand the glass type, since different glass types have different characteristics and can be more prone to breakage for different reasons. In areas where safety glass is used the panes must be stamped to identify what type of safety glass it is, or where the product standard requires it to be marked. The following list gives examples of the most common:

- **EN 12150** for toughened glass
- **EN 14449** for laminated glass
- **EN 14179** for heat soaked toughened glass (also referred to as heat soak tested)
- **EN 1863** for heat strengthened glass (not a safety glass)

For more information on glass markings please refer to "GGF Consumer Guide - Glass Marking"

If these stamps are not available and the glass type is unknown, then we can look at the breakage characteristics to understand what glass was used, this is known as the mode of breakage.



Note that with insulating glass sealed units formed from two or more panes with cavities between them, the glass types used for each pane may be different and hence have different modes of breakage.

Mode of Breakage



Annealed (Float) glass

The glass has broken with numerous cracks into a range of sharp shards some of which are large. The pattern of cracks is generally not consistent and this type of breakage should be considered as not stable.



Toughened glass / Heat soaked toughened glass

The glass has shattered into a large number of small particles not forming large shards. The pattern of cracks is normally consistent across the entire surface of the panel and this type of breakage should be considered as not stable.



Laminated glass

The glass has shattered or cracked but may have sagged and stayed in-situ, the fragments hold together and do not separate or detach. The pattern of cracks could be that of either annealed or toughened glass described above, but should remain intact.



Heat strengthened glass

The glass has broken with numerous cracks into several larger shards. The pattern of the crack is generally radial from the origin point. This type of breakage is more often than not stable.

Why did it break?

We can then look at the most common possible causes for breakage of each glass type. In general, all glass types can break for the following reasons however this list is not exhaustive:

Reason for breakage	Cause examples
Impact damage to the glass surface	• Glass struck by sharp object or projectile such as a stone or pebble kicked up by a lawnmower • Glass struck by a hard pointed surface of larger object hence the design of emergency 'break glass' hammers • Glass struck by soft or blunt object with sufficient force such as a football
Impact / Pressure damage to the glass edge	• Glass edge in direct contact with a hard material such as metal framing or a protruding nail/screw head • Glass edgework of poor quality or damaged in handling and unable to withstand pressure from adjacent framing
Load bearing capability / stress capability exceeded	• Significantly high wind loads • Significantly high snow loads (more typical for inclined glazing)
Thermal stress capability exceeded	• Large variation in glass temperature within the same pane, for example: • Glass partially covered by curtains / blinds / structure in close proximity to the glass surface • Glass partially or fully obscured by applied poster / graphic / signage / paint <i>NB: toughened glass is not susceptible to this.</i>

Is my breakage covered by the warranty?

Ultimately this would depend upon the terms & conditions of sale and warranty that were provided when your glazing product was purchased, relative to the type & cause of breakage experienced. It is also worth remembering that unless you purchased your glass directly from the glass supplier, the warranty for the glass remains with the party that purchased it which could be your window supplier or installer for example. In these instances it is best to report any breakages to the intermediate party for them to discuss with the glass supplier. As a general rule, the following are not covered by a glass processor warranty:

- Breakage as a result of impact
- Breakage as a result of nickel sulphide and other inclusions
- Breakage as a result of incorrect installation
- Breakage as a result of other materials applied to the glass, unless specified as part of supply agreement.

As the circumstances around breakages will be varied and may result from a number of changing factors, climatic and load conditions and combinations of glass types and different framing systems, then each should be considered individually using the guidelines detailed.

