



SPONTANEOUS BREAKAGE OF TOUGHENED GLASS & MITIGATION MEASURES

Consumer Guide



Introduction

Your quoted glazing package includes one or more panes of toughened glass and so the following information is important to understand:

The benefits

- Toughened glass, as the name suggests, is exceptionally strong. In fact, around 5 times stronger than ordinary annealed glass. This means it is capable of withstanding higher forces before it breaks, which means that thinner panes can be used to provide the same load resistance as much thicker panes of ordinary annealed glass.
- The increased strength of toughened glass makes it far more resistant to impact, meaning it can withstand knocks and accidental impacts that might break ordinary glass.
- Toughened glass is also capable of withstanding large and rapid temperature changes which would cause ordinary annealed glass to crack due to thermal stress, making it ideal for use in areas where this may occur, for example where blackout blinds are installed in close proximity to the glazing.
- When it does break rather than forming dangerous sharp shards of glass, toughened glass disintegrates into small relatively harmless particles, sometimes referred to as 'dice'. This mode of breakage is what makes toughened glass a safety glass suitable for use in all safety critical locations.

The predicament

Unfortunately, the production process for toughened glass is such that its use carries a remote possibility of the pane fracturing unexpectedly at some point in the future. This is because of the potential for particles inside the body of the glass pane. These particles or inclusions are a natural part of glass manufacture and are so small that it is currently impossible to detect them in the production process.

There is also currently no method to calculate the likelihood of encountering this phenomenon, though it is fair to say that it is a small fraction of the many hundreds of thousands of toughened panes produced each year in the UK. These particles can exist in other glass types (for example standard annealed panes) without causing any issue. It is generally only in toughened glass that it has the potential to cause a fracture, which unfortunately is for the very same reasons that give toughened glass the performance characteristics of strength and safe breakage, which make it such a good product to use when safety glass is required.



The mitigation options

Option 1

You choose, on the balance of probability, to accept the toughened glass as it is, with no further action taken. You accept that there is a small risk, but you are happy that the likelihood of suffering a spontaneous fracture is very small.

Option 2

The industry has developed a method to mitigate the risk of spontaneous breakage in toughened glass panes: heat soaking. This process is an optional extra and as such will necessarily incur an additional cost and lead time.

Heat soaked toughened glass is toughened glass that has been subjected to an additional manufacturing process, the end result of which is a product with a known level of residual risk of spontaneous breakage due to the presence of these critical nickel sulphide particles. The heat soak process is carried out in accordance with a British and European Standard (BS EN 14179) and involves putting the toughened glass through a carefully controlled heating and cooling cycle which is designed to cause critical nickel sulphide inclusions to break the glass during the cycle rather than when it has been installed in your home. The end result of this additional process is heat soaked toughened glass which has a greatly reduced statistical risk of spontaneous breakage due to the presence of critical nickel sulphide inclusions.

Option 3

In some scenarios toughened glass is not the only solution, for example where a safety glass is required. An alternative safety glass could be, for example, a laminated pane, which can also provide enhanced security and acoustic performance. A further advantage of using a laminated glass is that on breakage, the interlayer will retain the fragments and the pane is likely to remain in position.

However, as laminated panes are often thicker than toughened panes this may come with a compromise of its own such as reducing the cavity width (and thus increasing the U Value) or increasing the overall unit width.



The Choice

Having been provided with the above information, the choice of which option to take is for you as the consumer to make. Your supplier should not make this decision for you, since the consequences of the decision may have a bearing in future. For example...

...if you choose to opt for your toughened glass to be heat soaked you must accept that this comes with an additional cost and extended lead time, but will still not offer a 100% guarantee that your toughened panes will not suffer from spontaneous breakage.

...if you choose to opt for a laminated glass you understand that this alternative is only applicable in some scenarios and will likely create a compromise in performance compared to a toughened pane, and potentially carry an additional cost and extended lead time.

...if you choose to accept the toughened glass as it is and you are unlucky enough to suffer from a spontaneous breakage in future, the cost of replacements will be borne by you.

! Further Information

It is important to note that whenever toughened glass fractures, regardless of the reason, it has the potential to fall from the pane to the ground below. This should be considered where toughened panes are used overhead or in high level glazing.

For further information on glass breakages please refer to GGF Consumer Guide 'Glass Breakages'

Speak to your local GGF member company to discuss further, search via ggf.org.uk/members/



Other GGF consumer guidance

This booklet is part of the GGF Consumer Guidance Suite, a collection of resources designed to equip you with essential information. These guides will help you stay informed about best practices, ensuring you make well-informed decisions as a consumer.



The following is a list of some other titles in the GGF Consumer Guidance library:

- Condensation
- Consumer Code of Practice
- Emergency Glazing
- Glass Repair
- Guide to Conservatories & Orangeries
- Guide to Trickle Ventilators
- Low Sight Line Insulated Glass Units (Heritage)
- Window Film
- Visual Quality Guidelines for Coated Glass including Low-E
- Visual Quality Guidelines for insulated glass units
- Visual Quality Guidelines for PVC-u Windows and Doors
- Visual Quality Guidelines for Aluminium Windows and Doors

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<https://www.ggf.org.uk/consumer-guides>



The Glass and Glazing Federation (GGF) is the leading trade association representing companies in the glass, glazing, and fenestration industries in the UK. Established to promote best practices and uphold high standards, the GGF offers guidance, support, and resources to its members, who range from manufacturers and installers to suppliers and contractors.

Why it makes sense to choose a GGF member

Be sure that the company you deal with is proficient, professional and promote best industry practice, by insisting on a member of the Glass and Glazing Federation.

- Ensure the company you choose is experienced, reliable, and meets industry standards by selecting a member of the Glass and Glazing Federation (GGF).
- GGF members undergo vetting before joining to ensure they are financially stable and prioritise safe practices.
- Members are required to adhere to British Standards and the GGF Code of Good Practice.
- If you encounter any issues with a GGF member, the Federation provides a complaints service and, if necessary, arbitration.
- Members are expected to display the GGF logo - always look for the logo as a mark of trust and quality.

Glass and Glazing Federation

40 Rushworth Street
Southwark
London
SE1 0RB

 www.ggf.org.uk

 technical@ggf.org.uk