

5 reasons why the tempered glass self explosion and 7 effective ways to avoid tempered glass spontaneous breakage(2022) .



It is often seen in the news reports that the tempered glass shower door or the tempered glass tabletop is exploding for no reason. For example, last week, the tempered railing glass in my friend's house suddenly broke after 13 years of usage(As the picture is shown below). For many people, tempered glass is already considered as safety glass, and has higher strength can endure a strong impact.

But why does tempered glass self explosion without any signs? Are there any methods to avoid it? Here in this article, we are going to discuss this issue and provide professional suggestions!



Staircase railing tempered glass spontaneous breakage

Reasons for tempered glass self explosion:

1. The impurities in the raw float glass material.

There are stones, chips, and bubbles in the raw float glass: **the impurities** in the flat glass are the weak points of the tempered glass as well as the stress concentration points. Especially if the weak point is in the tensile stress zone of the tempered glass will cause the tempered glass self explosion.

2. Nickel sulfide phase changing from α -

NiS to β -NiS.

Nickel sulfide is the main cause of tempered glass spontaneous breakage. As NiS transfer from α -NiS to β -NiS, the volume will increase dramatically which eventually causes the tempered glass stress releases and final tempered glass spontaneous breakage.

3. Tempered glass surface has defects.

The tempered glass **surface has defects** such as scratches, chips, etc due to improper processing or operation, which may cause stress concentration and later cause the spontaneous breakage of tempered glass with no signs.

4. Ambient temperature changes dramatically.

When the glass is heated or cooled, the temperature gradient along the thickness direction of the glass is uneven and asymmetric, causing a tendency of tempered glass exploding. If the tensile stress area shifts to one side of the product or shifts to the surface due to temperature stress, will cause the tempered glass self explosion as well.

5. Tempering stress too high.

The influence of the **degree of tempering**. Experiments have shown that when the degree of toughening increases by 5%, the tempered glass self explosions rate will increase by 20%~25%. It is obvious that the greater the tempering stress, the higher risk of tempered glass self explosion.

Solutions for reducing tempered

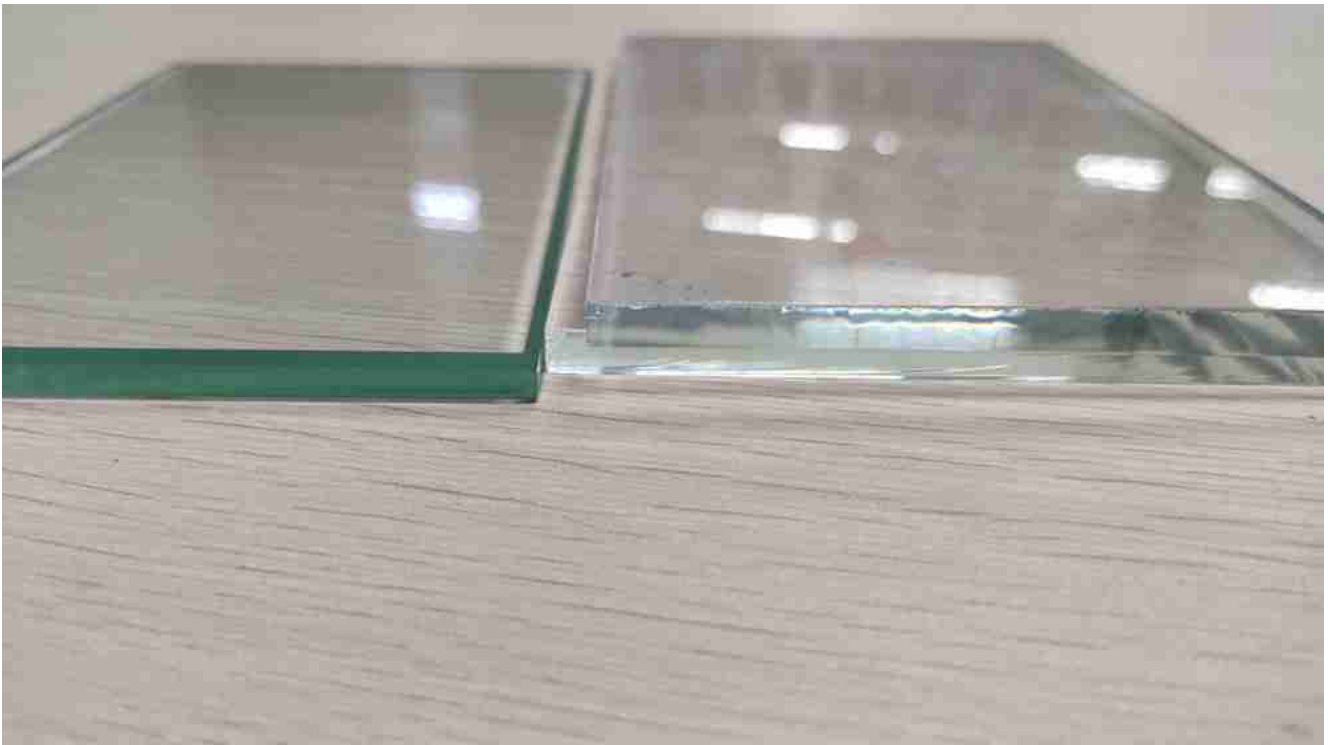
glass self explosion rate.

1, Use high quality raw float glass material.

There are generally several grades of float glass.

- **Grade A:** no bubbles, no chips, no scratches super smooth surface. Tempering rate up to 99% without explosion.
- **Grade B:** some bubbles, some stones, some chips, etc flaws allowance which are hardly seen by bare visual inspection.
- **Grade C:** has obviously flaws and color differences but is accepted by some projects for which quality is not required at all.

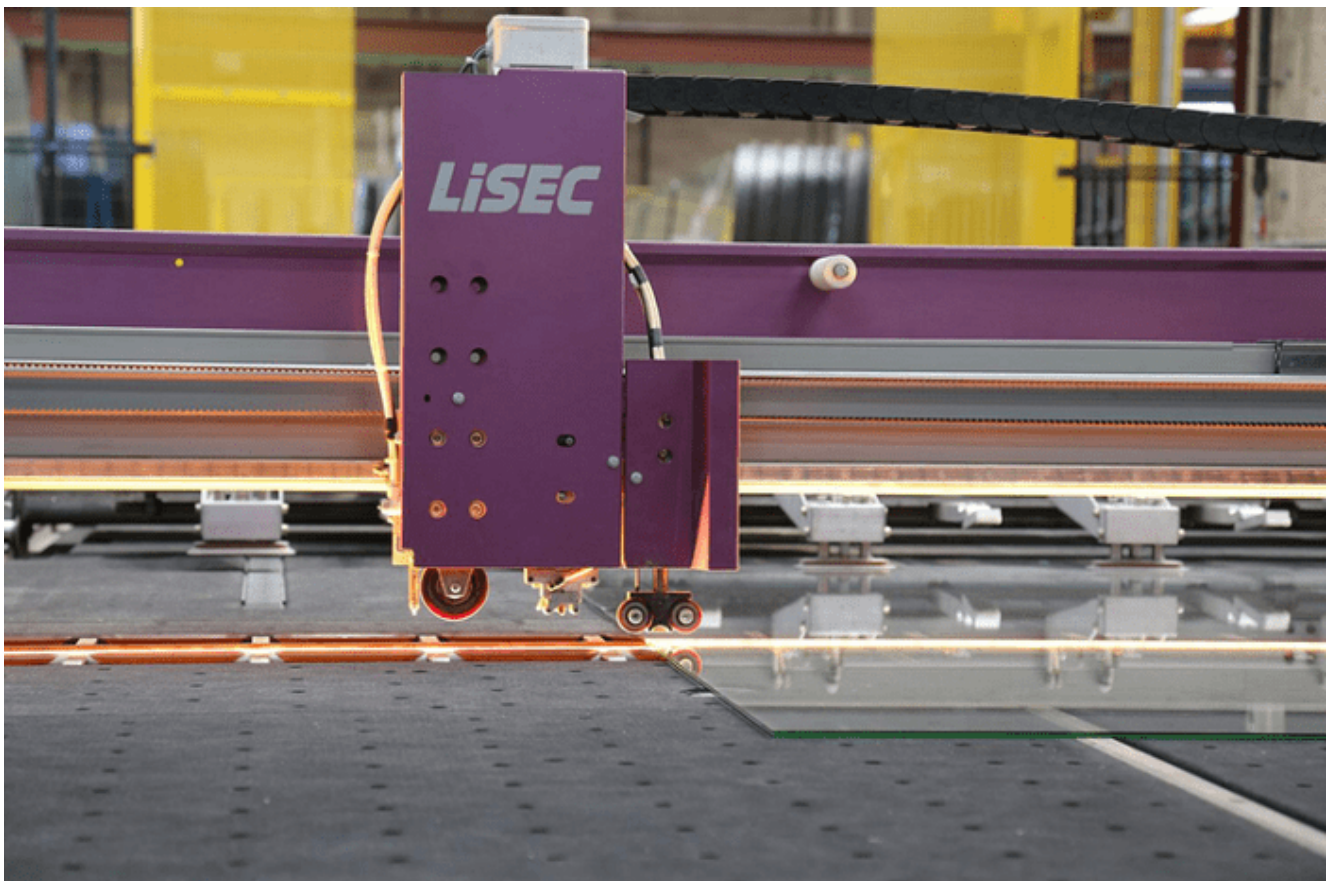
Using **grade A glass** will dramatically reduce the tempered glass spontaneous breakage rate, also ultra clear glass will be recommended if the budget allowed.



Clear glass vs low iron glass

2, Use advanced glass cutting machines & glass grinding machines.

Advanced glass cutting machines such as Bottero or Lisec etc heavy cutting machines to make sure glass is cut to size accurately. Advanced glass edging machines to reduce or avoid glass surface micro-cracks. Or choose soft belt grinding machines for edge processing.



Lisec glass cutting line



Bottero glass cutting line

3, Super advanced tempering machines & good control of glass tempering quality.

Super good tempering machine and experienced glass tempering operators to ensure tempered glass stress super uniform and smooth surface. This is a key process for controlling the tempered glass self explosion rate. [Shenzhen Dragon Glass](#) can guarantee to temper stress >90Mpa, in the meantime tempered stress uniformity <8Mpa. Providing super flat surface tempered glass.



Super advanced glass tempering machine can guarantee the tempering stress uniformity

4, Heat soak test.

Adopt [heat soak testing process](#) to make that tempered glass which has NiS impurity explode in advance before sending it to the installation site. This is a double guarantee for avoiding the tempered glass self explosion after the tempering process.



Shenzhen Dragon Glass heat soak test oven.

5, Use heat strengthened glass if possible.

Choose [heat strengthened glass](#) if strength can meet the architectural design requirement. Heat strengthened glass is 2 times stronger than normal annealed glass and has better glass flatness than tempering glass. It is not rated as safety glass but can be further processed as [laminated safety glass](#) to enhance its safety and strength, in the meantime avoiding the tempered glass self explosion.

6, Choose a reliable tempered glass manufacturer.

Choose an [experienced tempered glass manufacturer](#) to guarantee quality control for tempered glass. [Tempered glass manufacturer with a good reputation](#) is the fundamental warranty, it can help you assure using the best raw glass material and under strict glass quality control, which can greatly reduce or even erase the tempered glass exploding rate.

7, Avoid distortion in the tempered glass installation process.

Avoid installation distortion stress for the tempered glass, this requires an accurate on-site inspection for size specification. Accurate installation for tempered glass with consideration of temperature changes, structure allowance, etc can greatly reduce the tempered glass spontaneous breakage.

So what do you think of the above solutions? Do you have any other ideas?

[Welcome to share with us!](#)