



Useful information on

Spontaneous breakage of thermally toughened (FT) safety glass

When producing glass, whether working with float glass or drawn glass, it is possible for minute nickel and sulphur crystals, known as nickel sulphide or NiS inclusions, to form.

Though bubbles, blisters and small stones may be extremely rare, they are generally clearly visible due to their size and the associated optical change (blemish).

This is not the case with the smallest NiS. The size of these inclusions is usually somewhere below 0.2 mm, making them nigh on invisible to the naked eye. Exposing the NiS inclusions to varying temperatures can cause them to change their state (allotropic transformation), thus growing considerably in size – provided they are located in the tensile stress zone of the thermally toughened safety glass. This can cause the stress in the glass to rise considerably and, in extreme cases, even cause the glass to shatter for no apparent reason. This breakage is known as ‘spontaneous glass breakage’, which, however, only occurs in toughened safety glass. It happens extremely rarely and may occur up to ten years after manufacture.

The heat soak test (HST) is a very successful method of protecting against spontaneous breakage. That being said, producing float glass that is completely nickel sulphide-free is not yet possible.

Heat soak test (HST)

To avoid spontaneous breakage, thermally toughened safety glass is subjected to a heat soak test in accordance with DIN 14179 after manufacture. This is mandatory for rear-ventilated façade panels used as exterior wall cladding.

During this process, the panes are stored in an oven maintained at an average temperature of 290°C ($\pm 10^\circ\text{C}$). This method destroys and thus identifies prior to delivery 95% of thermally toughened safety panes with nickel-sulphide inclusions with an inherent associated increased risk of breakage. However, one can never be 100% sure.

Breakage due to spontaneous glass breakage does not constitute a warranty claim.