Exploding Glass Panels – Building Defects

The problem of nickel sulphide particles causing toughened glass panels to spontaneously shatter or explode without any mechanical damage being caused to them has been known about in expert glass articles since at least the 1960's or 1970's.

Toughened or tempered glass is also known as "safety glass" and was originally developed for use in car windscreens to ensure that the risk of injury to those nearby from broken shards of glass was minimised when a glass panel was mechanically damaged by an external object such as a stone.

Rather than shattering into large shards the toughened safety glass shatters into small normally hexagonal pieces which are usually harmless when coming into contact with nearby people.

The nature and performance of toughened glass has led to it being used in large flat panels often in retail or commercial buildings, but also in the curtain wall of residential buildings where it is believed that the panels may come into contact with people.

Toughened glass panels can obviously also shatter when mechanically or physically damaged by outside factors like birds, rocks, windblown objects, vandalism and other physical damage during manufacture or installation but these are not regarded as spontaneous.

Toughened glass is made by a process of heat strengthening by subjecting each panel to a uniform temperature of up to 620 degrees celcius and then cooling it. Nickel sulphide inclusions are the product of the fusion between nickel and sulphur during the manufacture of the glass. The resulting nickel sulphide particle in the glass can cause the panel to crack particularly when subjected to extreme heat on very hot days when the panel has been installed in the curtain wall. The crack pattern is distinctive because it starts with a tiny butterfly shaped crack at the position of the nickel sulphide particle and quickly radiates out from that fracture.

The process of heat soaking of toughened glass was originally developed by the industry in the 1960's in an attempt to minimise the risk of spontaneous fractures in toughened glass. If the glass is not properly heat soaked then the fractures may occur without warning and usually within the first 5 years, tapering off with less failures for the years 5 to 10 of the life of the glass.

The best options where a building is experiencing such failures are to replace all the glass, but this is obviously very expensive. It is also possible to coat each glass panel with a high performance safety film, but this process is also expansive and only temporary. As the rate of failure is minimal it is also possible to obtain specialist services which can review each panel and determine which ones are likely to fracture.

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Given the knowledge of this issue for over 50 years it is possible that if your building is experiencing such a problem that a claim can be brought against the original builders , developers and designers who caused this particular glass to be used.

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