

## **SPONTANEOUS BREAKAGE**

### **Description:**

Tempered glass is four times stronger than annealed glass, however the edges are very fragile. Under certain circumstances, glass can burst spontaneously. In this case, the glass breaks into small fragments that will more than likely fall out of their frame. The cause can be explained in different ways.

### **Damage to the edge of the glass:**

If the glass perimeter is damaged during handling or installation, it will be weakened and spontaneous breakage may occur thereafter. Also, the edges of the glass that are in contact with metal, may be damaged by friction, either by movements caused by temperature variations or by the wind, in the case of a curtain wall, or by improper hardware installation. The friction can eventually cause the glass to break spontaneously.

### **Glass inclusions:**

During the glass manufacturing process, impurities such as nickel sulphide are difficult to detect in the raw material. These impurities will expand during the tempering process and may cause spontaneous breakage of tempered glass.

During the glass manufacturing process, certain imperfections such as bubbles, eyes and small agglomerates can form in the glass. These are easily detectable since they cause optical distortion. It is different from the nickel sulphide inclusions that can appear, and which size is generally less than 0.2mm. These small inclusions are unfortunately not detectable. During extreme temperature variations, these inclusions can expand and cause an increase in the glass tension which may burst without apparent cause, called "spontaneous breakage". This type of breakage occurs rarely but may occur up to 10 years after the glass production. Since it is impossible to produce float glass without any nickel inclusions, Heat Soak Test may be suitable for glass installed in high elevations, locations and areas that are difficult to reach. This test consists in heating the tempered glass, in a specially designed oven which in turn would attempt to cause the glass containing nickel sulphide inclusions to burst prior to sending it to the customer. The HST is performed to reduce to a minimum security and financial risks inherent to spontaneous breakage.