

Window Safety Film for Spontaneous Breakage

Spontaneous breakage is a very real issue with tempered, thermally treated glass (TTG). The most common cause for this spontaneous breakage in TTG is nickel sulfide (NiS) inclusions. Nickel sulfide inclusions are small, pencil point sized pieces that may be found within a sheet of glass. These inclusions are not an issue in more common annealed glass. However, in tempered glass they can expand due to thermal cycles, breaking the outer plane of compression and causing the entire sheet of glass to basically explode.

Although TTG breaks into small fragments, these pieces can still cause injury if they were to fall out of a building above pedestrians. Through our extensive testing, we have also witnessed portions of the panes of TTG, once broken, holding together until they reach impact. These large fragments of glass can strike with considerable weight and force.



Overhead sloped glazing testing

Madico's SafetyShield window film is a tested solution and will hold a broken sheet of tempered glass in place once NiS failure occurs. Depending on the size and weight of the glass, a 4, 7, or 8 mil safety film is used.

Due to the break pattern of tempered glass, we do not recommend a simple daylight installation of safety film. Daylight installations have the film installed on the visible portion of the glass. In this installation, once spontaneous breakage occurs the entire sheet of filmed glass may potentially fall from the opening. An anchoring restraint system (ARS) is always recommended for TTG installations. Mechanical anchoring systems such as FrameGard® hold the film in place through a combination of screws and tape with an aluminum extrusion. This is by far the safest attachment system, tested to hold from 500 to 800 pounds per linear foot of attachment.

Because many situations do not allow for screws to be used, the Wet Glaze attachment system is another option. Wet Glaze attachment systems have been thoroughly tested to blast mitigation standards. As such, they are a very viable option for NiS failure mitigation. In a Wet Glaze installation the safety film is installed in a daylight configuration and then a sizeable bead of structural silicone is used with a minimum of a 3/8 inch contact with the film and the frame. Heavier pieces of glass may require a blast bead which uses 1/2" contact on both the film and frame. In smaller glass applications such as balusters, a single bead along the top of the glass, effectively attaching the glass to the hand rail is sufficient. For larger glass areas it is recommended that all 4 sides have the structural silicone applied.

Other attachment systems installed with VHB tape are also available. Choosing the best system for your glass is based on the weight of the glass and the type of framing system that is in place. A trained safety film professional should be consulted to help with this decision.