


# LLUMAR® GLASS RETENTION FILM

A smart solution for reducing spontaneous breakage hazards



The presence of small impurities known as nickel sulfide inclusions can expand and cause tempered glass to spontaneously break.

## Alleviate concerns about spontaneous breakage

Tempered glass is often preferred to standard annealed glass, because it's understood to be stronger and safer. This is true – but use of tempered glass creates a unique hazard many people are surprised to learn about. It can spontaneously explode into a shower of glass without warning.

This phenomenon is known as spontaneous glass breakage. In the past few years, it has struck high-rise buildings around the globe. In some of these cases, tempered glass windows or balconies suddenly burst into thousands of jagged pebbles and rained down, causing harm to people and property below.

Tempered glass fragments do tend to be less sharp than standard glass fragments. Still, the danger posed by broken tempered glass is great enough that building code writers, architects, government officials, and other industry professionals are reconsidering applications.

Take a powerful, protective step with professional installation of LLumar glass retention film and silicone attachment system. It's an affordable upgrade for existing tempered glass that's ideal for retrofit projects as well as new construction.

## Spontaneous breakage: What we know

- **Timeline:** When tempered glass spontaneously breaks, it's typically in the first 2 to 7 years after installation. The probability of breakage decreases with time.\*
- **Repetition:** Buildings with multiple spontaneous breakage instances often have huge expanses of glass, which automatically increases the probability of breakage.\*
- **Nickel sulfide** can be present in annealed and heat-strengthened glass, but are not subject to spontaneous breakage because the slower cooling cycle in these glass types either halts the stones' phase change or traps them before they can expand.



LLumar glass retention films have been tested to withstand up to 175 mph winds (280 km/hr).\*\*

## Dependable protection with lasting benefits

LLumar glass retention film and (attachment system, when applicable), creates an optically clear, scratch-resistant and UV-resistant barrier to help prevent damage and harm. In the event of breakage, the film and (attachment system, if applicable) helps hold glass fragments in place until they can be safely removed and replaced.\*\*

This minimizes the risk from spontaneous breakage in several ways:

- Help protect occupants from potentially hazardous situations involving broken tempered glass on interior doors, panels and balconies\*\*\*
- Helps protect property and passers-by from showers of falling glass on building exteriors
- Help shelter your building's interior from the elements should exterior-facing windows break
- Gain time to manage safe glass removal and replacement
- Avoid temporarily replacing broken exterior-facing glass with unsightly plywood

## Recommended solutions:

### *Exterior-facing windows:*

Windows with 1/4" (6mm) panes and up to 24 ft<sup>2</sup> (2.25 m<sup>2</sup>):

LLumar SHE/SXA exterior 4mil glass retention film and silicone attachment (see LLumar TBF-44)

Windows with glass thicker than 1/4" (6mm) or over 24 ft<sup>2</sup> (2.25 m<sup>2</sup>):

LLumar SHE/SXA exterior 7mil glass retention film and silicone attachment (see LLumar TBF-44)

### *Interior tempered glass panels, balconies or glass:*

Windows with 1/4" (6mm) panes and up to 24 ft<sup>2</sup> (2.25 m<sup>2</sup>):

LLumar SCL SR PS4 safety film (attachment system only if falling glass poses a hazard)

Windows with glass thicker than 1/4" (6mm) panes or over 24 ft<sup>2</sup> (2.25 m<sup>2</sup>):

LLumar SCL SR PS7 safety film (attachment system only if falling glass poses a hazard)

**EASTMAN**

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\*[www.wfm.co.in/post/spontaneous-breakages-in-tempered-glass/](http://www.wfm.co.in/post/spontaneous-breakages-in-tempered-glass/) \*\*LLumar glass retention films with attachment systems have been independently tested on dual-pane tempered glass that was intentionally broken and subjected to ASTM E1886/E1996 windstorm testing and withstood over 9,000 cycles and up to 80 pounds per sqft (3830 Pa) of pressure - approximately equal to 175 mph wind (280 km/hr). Test reports available upon request. \*\*\*[www.usglassmag.com/2016/03/ongoing-lawsuit-involves-spontaneous-breakage-of-tempered-glass/](http://www.usglassmag.com/2016/03/ongoing-lawsuit-involves-spontaneous-breakage-of-tempered-glass/) © 2019 Eastman Chemical Company. LLumar® and the LLumar® logo are trademarks of Eastman Chemical Company or one of its wholly owned subsidiaries. As used herein, ® denotes registered trademark status in the U.S. only. Visual renderings are for illustrative purposes only; actual appearance of windows treated with film may vary. (3/19) L2378