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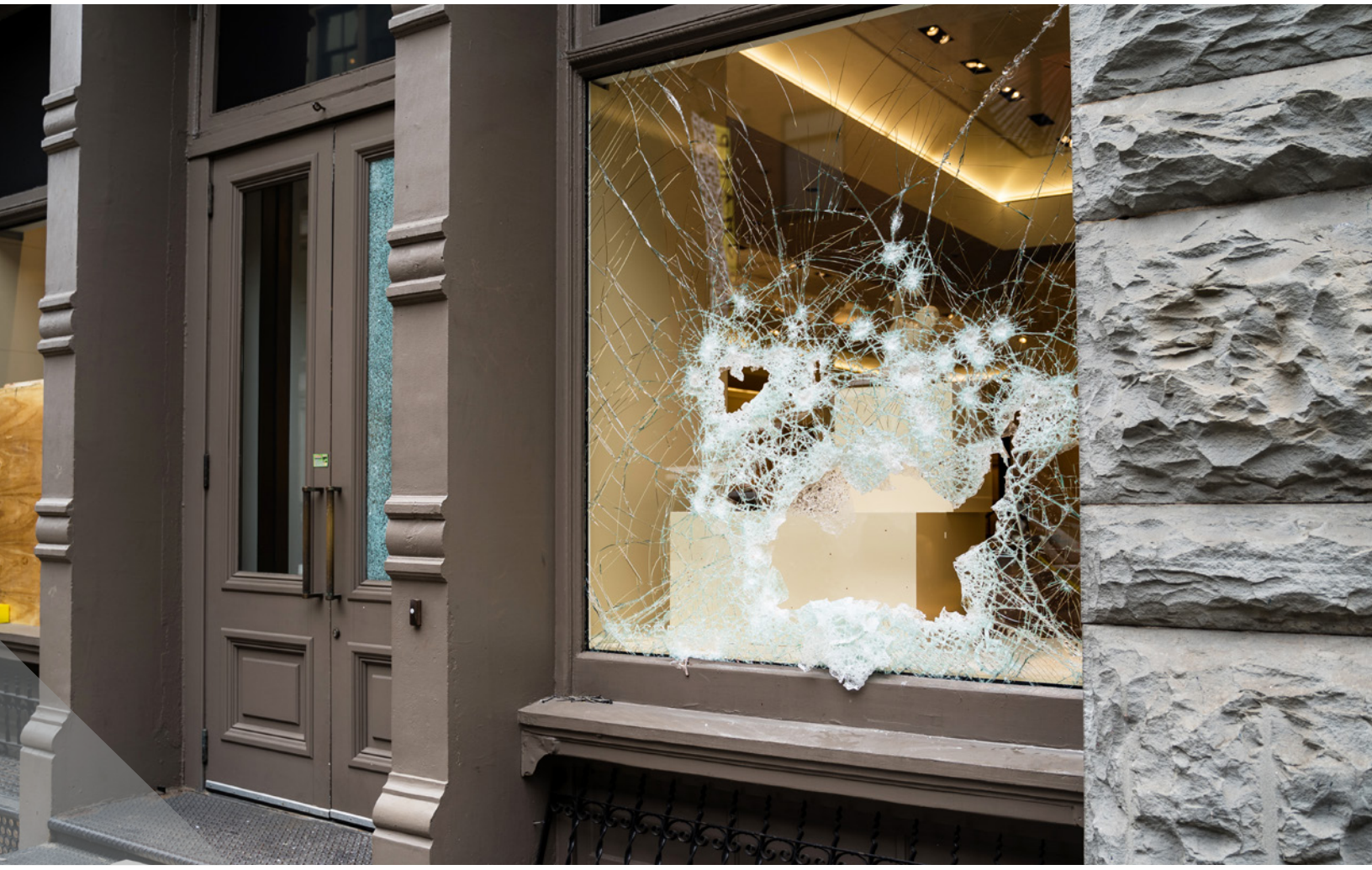

HOW TO PROTECT YOUR WINDOWS & HARDEN THE BUILDING PERIMETER IN THE PROCESS

NGS

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Windows and other glass openings are the most vulnerable areas of a building. Window security and safety products can reduce the risk.

Security professionals have known for years that windows are inviting targets for criminals. This vulnerability was on full display during the January 6 insurrection when rioters broke through windows at the National Capitol. Only a few months earlier, looters who infiltrated last summer's racial justice protests caused millions of dollars of damage to urban businesses by breaking through glass storefronts.

Schools have also experienced tragedies because of their window vulnerabilities. The gunman responsible for the 2012 Sandy Hook Elementary School mass shooting was able to enter the school building by smashing the windows at the campus front entry. As a result, 20 school children and six adults lost their lives that terrible day. (It should also be noted that the Sandy Hook Advisory Commission final report recommended impact glass, laminated glass or safety film retrofitted glass to mitigate access and potentially prevent or reduce the loss of life.)

Custom printed glass graphics of tree/forest graphics for privacy (safety) and design.

However, windows that have been reinforced to mitigate impacts have saved lives. The gunman responsible for the 2018 Marjorie Stoneman Douglas High School mass shooting in Parkland, Florida, for example, was foiled from setting up a sniper position on the third floor of his school because hurricane-resistant windows were installed.

"The rounds fragment and splinter immediately, and they do not find targets." Detective Zack Scott, one of the lead investigators on the case, told the New York Times about the gunman's failed attempts to shoot through some of the school's windows.

Although the Parkland mass shooting still resulted in 17 fatalities, the death toll could have been much higher if the gunman had been able to accurately shoot at students through glass that wasn't hurricane resistant.

Another benefit of windows that are reinforced with some sort of security or safety solution is that they can mitigate damage caused by bomb blasts or other types of explosions. In fact, the move in America to install window security solutions in federal buildings came after the 1995 Oklahoma City bombing.

Despite these obvious benefits, window security and safety products often fly under the radar when school, college and healthcare protection professionals consider making upgrades. These and other organizations would be wise, however, to add these systems to their overall campus protection profiles.

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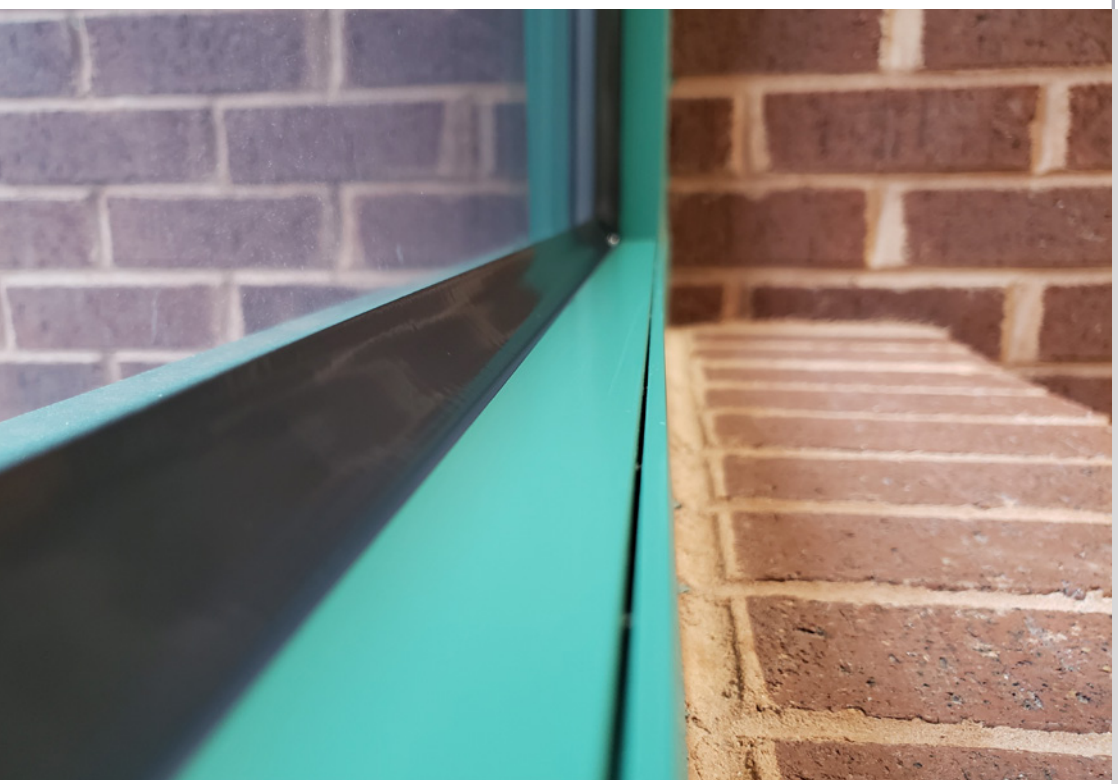
Window Security and Safety Solutions Have Many Benefits

The beauty of window security and safety products is that they address several pain points often experienced by campuses. In addition to their security benefits, they can also protect building occupants from flying debris during high-wind events such as hurricanes, and even protect pedestrians from falling debris in seismic events.

In the Parkland example above, the school benefitted from the fact that Florida Building Code requires all windows and doors be impact-protected if the building is within one mile of the coast where wind speeds can exceed 110 MPH. The changes to the building code came after Hurricane Andrew's massive devastation in 1992.

Additionally, installing top-tier window film technology not only improves safety and security, it can help conserve energy and reduce energy costs. The U.S. Department of Energy estimates that nearly 75% of existing windows are not energy efficient, and 3M estimates window film can reduce heat gain with some dual function solar security films by up to 70% on single pane clear glass during the summer months. Window film can also reduce heat loss in the winter.



This is the 3M impact protection adhesive installed on the 3M S25 tinted (dual function solar and safety) ultra 800 safety film at Forsyth County Schools in Georgia as part of their building perimeter hardening.

Another benefit is cost. Window films are relatively inexpensive and offer a good return on investment (ROI), especially when they prevent or mitigate major security events (and even minor incidents such as vandalism, which happen frequently). Additionally, utility companies often provide fairly substantial rebates, which further reduce the costs of window security and safety solutions. Also, for campuses looking to reduce their environmental footprint, installing window film can help them qualify for LEED credits.

Aesthetics is another benefit. When window film is installed in places like cafeterias, libraries, student unions and the like, floor-to-ceiling graphics can be printed on them to create an environment that is more conducive to learning in educational facilities or more conducive to healing in healthcare centers.

"We've done some incredibly cool custom forest printed graphics on window films in libraries for elementary schools, so that the whole library looks like the inside of a forest," says James Beale, managing partner for National Glazing Solutions LLC dba NGS Films and Graphics (NGS), a company that installs window films, graphics and signage for commercial buildings and campuses. "The images of trees are printed on the glass and it's translucent, so the light still comes through. On a bright day, it pops and it's a nice, inspiring environment for the kids as opposed to them feeling like they are inside a brick box."

ADA signs, wayfinding graphics, logos and other images, like school mascots, can also be included to provide important information and support an organization's brand.

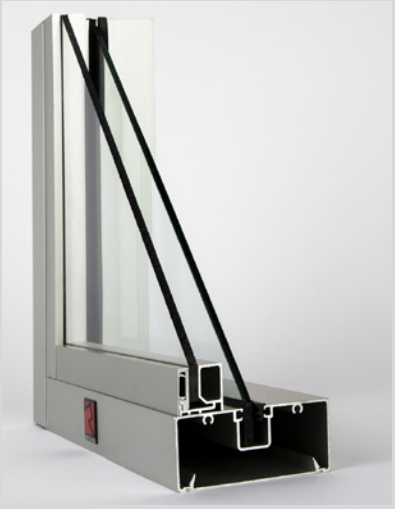
How Window Security and Safety Products Work

There are a wide variety of window security/safety solutions on the market today.

For example, NGS has multiple tiers. Its lowest recommended tier is a 3M Ultra 800 8mil thick micro-woven layer of film installed on the inside surface and attached with the 3M Impact protection adhesive that adheres to the inside of the glass. Tier one is designed to slow people down from unauthorized entry, meet small missile impact and stop window fragmentation. It is recommended to add another exterior weatherable 3M S70X 7mil on the exterior for maximum protection from an applied film application.

NGS' highest tier is the company's "Riot Glass," which is an access denial product that is virtually impenetrable and has been HP white tested (passed) and passed large missile impact testing for Miami Dade protocol.

Many of the window protection products installed, particularly in southern states such as Florida and Texas, are dual-purpose solar security films. In addition to the security and energy efficiency benefits described above, the dual-purpose film provides another security benefit: it's easy to see out of but not into. So, criminals can't see what or who is inside the building, while those on the inside can see what's going on outside their windows.



This is a cross section of Riot Glass that shows the framing and armorplast panel installed in front of the window.

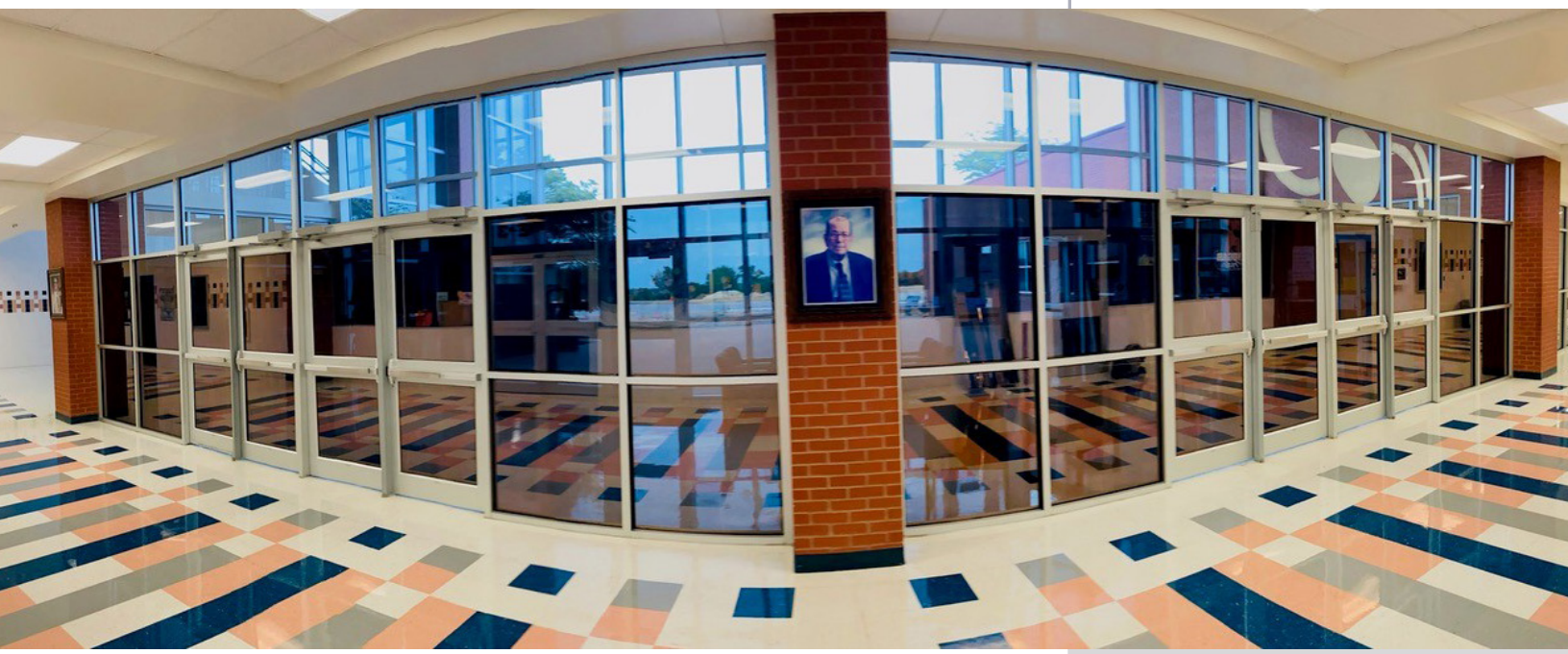
Where Products Should be Installed

NGS utilizes a "zoned" approach to application that mirrors the Federal Commission on School Safety's guidance. In essence, entrances are the highest risk and thus ZONE 1. Other exterior glazing for non-entrance areas are ZONE 2, and interior door windows are ZONE 3. This approach helps facilities and security professionals identify where the highest priority areas are and where to prioritize the budget. It should also be noted that the building and glass/window type should also be considered in the product selection. One size does not fit all. For example, a product installed in a secure front vestibule might not be appropriate for a classroom.

It's not just window and building design that needs to be considered, however. The level of local law enforcement response to emergencies needs to be part of the equation in the product selection process.

During the summer 2020 looting incidents as well as the January 2021 Capitol insurrection, many police departments were so overwhelmed with the level of violence and number of incidents that they couldn't respond effectively... or at all in some cases.

"In the absence of police response, the bad guys have all the time in the world and in a lot of cases they come prepared," says Beale. "They come with bags of tools, heavy objects, sledgehammers, picks, whatever, and they go to work for as long as they need to get through. In those types of events, security film is not the answer."



This is an inside view of 3M's one-way mirror film installed across the back of the vestibule entry so that people walking towards that entry from the outside cannot see in but people on the inside can see out clearly.

How to Select a Provider

It's critical for a campus to select the right vendor to install its window security and safety solution. Due diligence is critical. School, hospital and university officials must verify the credentials of any window security/safety vendor. Do they have references? Have the products they are representing been tested, and are they appropriate for a particular application? Are they an authorized dealer/installer for the manufacturer's products they are selling? Have they been awarded and successfully completed government contracts or contracts for other school districts?

Beale warns about companies claiming their window films are bulletproof.

"There's not a single window film out there in the world that is bulletproof," he says. "It's such a tragedy that there are companies out there making these kinds of claims. Make sure that the product you're looking at has, in fact, been tested and is comparable to what you're trying to achieve. If it's storm mitigation, are you trying to meet large missile impact or small missile impact? There is no window film out there that will meet large missile impact, but a lot of them will and have been tested to meet small missile impact if they're on the right frame types. I say that because a lot of schools have wood doors. If you have a wood door, you can't anchor it. Therefore, you can't meet the test conditions."

Beale says that his company is currently working with many older schools with wooden doors, and that he tries to manage their expectations due to the limitations posed by those types of openings.

Other questions or topics that should be covered include:

- **How will the film anchor?**
  - › Film anchors to the frame using a structural adhesive that is applied to all 4 sides. A minimum profile of 3/8" on an aluminum or steel frame is required to meet test conditions.

- **What does the film need to be tested for?**
  - › Forced entry is essentially a moving target and thus most forced entry tests are insufficient to be good predicters of performance. A quality and proven 8 mil. or thicker film that has been blast tested is a good baseline.

- **What is the best glass type (single pane, dual pane, tempered, annealed, laminated)?**
  - › Laminated and annealed glass performs the best with an applied film and anchoring system.

- **What's the budget?**
  - › Budgets should range between $12- $20/sq. ft. installed, depending on the product applied.

In addition to checking references, a campus should consider calling the window security and safety product manufacturer and ask for a recommendation on who should install their product.

Window security and safety products are excellent ways to cost effectively protect any organization. Learning about the various products that are currently available and doing your homework on vendors will ensure you get the most effective solution for your campus.

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For a free assessment and consultation,
contact NGS at security@filmsandgraphics.com.