### Uncompromised Protection, Enhanced Security



Custom solutions for blast hazard protection and electronic eavesdropping



**DESIGNED PROTECTION**<sup>®</sup>



# Quality, Integrity and Expertise

GlassLock has earned a reputation, across the United States and abroad, for its product integrity, quality installation practices and in-depth knowledge of security mitigation technology.



### **GLASS LOCK** DESIGNED PROTECTION<sup>TM</sup>

Every installation starts with a detailed preparation plan, overseen and executed by a GlassLock Project Manager, and includes these steps:

#### Complete Customer Service

- Review and understand the customer's technical requirements.
- Complete detailed site survey to determine scope of the project.
- Determine glass condition and preparation
- Evaluate physical access, need for scaffolding, lifts, etc.
- Identify logistic concerns and problems.
- Determine customer's scheduling priorities.
- Establish crew size to best meet client's schedule.
- Develop plan of action with milestones.
- Determine work hours allowed in affected buildings.

• Arrange supply of materials and consumables for project.

• Meet insurance requirements.

• Establish quality assurance and safety plans to minimize risks.

• Obtain client approval for overall installation schedule.





#### **Designed Solutions**

Successful custom installations for (clockwise): EPA, Inter-American Development Bank, Buildings at Federal Triangle, Washington DC

- Conduct site inspections with client weekly.
- Conduct scheduling and safety briefings with all crew daily.
- Send reports as required by client to show work completed and adherence to schedule.

Contact us to discuss your site requirements and your designed protection options

GLASS LOCK Designed Protection

866-980-0858



# Uncompromised Security, Enhanced Protection

Protecting people and information is GlassLock's mission— a mission we undertake every day for government and commercial customers. At GlassLock we combine many years of technical expertise and project experience to provide the best in customized protective glazing.

GlassLock is the industry leader in providing both hazard protection and eavesdropping countermeasures for window systems. We are the leader because we provide innovative, customized solutions rather than off-the-self products with limited benefits. Whether we're securing a new building under construction or retro-fitting an existing structure. GlassLock offers complete turnkey service, includ-

ing site surveys and installation procedures tailored for each facility.

The challenge in protecting people and information never has been greater. Windows face both natural threats, such as hurricanes and windstorms, earthquakes, as-well-as manmade threats, including forced entry and bomb blasts. Similarly, as new technologies—proliferates in the workplace and other settings, transmitted information is increasingly vulnerable to remote eavesdropping.

Whether a government agency, military installation, commercial business or public venue, everyone faces growing safety

and security needs. GlassLock meets these needs with its highquality products and services. Our ForceDefender<sup>TM</sup> protective glazing systems are protecting millions of people around the world daily.

ForceDefender<sup>™</sup> protective glazing systems include primary and secondary window systems, doors, BlastBlinds<sup>™</sup>, store fronts, catch bar systems, ballistic resistant glazing, mullion and lobby reinforcement, masonry anchors, FRF and architectural glazing anchors.

To address eavesdropping threats, GlassLock offers a complete product line of window solutions and architectural coatings called SpyGuard<sup>™</sup>. Tested at the highest government levels and proven to mitigate all forms of electronic eavesdropping. SpyGuard<sup>™</sup> products provide Tempest and Wireless (802.11) security requirements mitigation. Also available in fragment retention film and ballistic lay-ups, SpyGuard<sup>™</sup> can provide total physical protection.

GlassLock products are backed by exceptional service, from assessment and design to project planning and execution, including installation and maintenance. "Architectural glass has been used in buildings for centuries, but the recent use of larger areas of glass and the desire to minimize or remove the supporting structure, has placed greater demand on the glass a structural material."

GLASS LOCK

DESIGNED PROTECTION<sup>TM</sup>

Glass Failure, Glass Hazard <sup>Uni-</sup>



versity of BATH Center of Structural and Architectural Engineering "...the building is almost completely made to resem-

ble a glass house, which could be devastating in an emergency scenario...that is to say, that when shattered, each piece of glass becomes a potential flying piece of cutthroat shrapnel!!" - excerpt from an Al Qaeda operative's potential target assessment report.

By enhancing the aesthetics of buildings with glass, they are made more susceptible to glass failure and terrorist attacks.

Protecting the Homeland one building at a time.



# Quality, Integrity and Expertise

Engineered and tested products are just part of the GlassLock customer solution. Expert installation ensures proper performance. Offering total turnkey solutions, GlassLock addresses the uniqueness of each client's site requirements.

GlassLock provides a complete range of protective glazing services from assessment and design to project planning and execution. We have an outstanding history of project performance and satisfied clients. GlassLock has designed and deployed solutions for government and commercial customers around the world. Our highly qualified team understands how to work with a client's facilities and their personnel to achieve project success with minimal mission impact. Our



comprehensive approach is the result of in-depth knowledge and experience with the most advanced blast and information security mitigation technology available.

Maintenance support is offered to ensure the continued, highest level of performance of each protective glazing system installation and allows for quick response to emergent requirements.



**The Situation:** A major federal agency needed to provide glass hazard blast mitigation to a large research and administrative facility in an urban downtown locations, with multiple floors and a three story lobby front, independent blast engineering reports indicated that the required Performance Criteria could not be met by

#### Complete Designed Protection

treating just the glass. The frames and anchoring substrate were of significant concern, especially in the lobby curtain wall with new primary systems would be a budget breaker.

**The Solution:** Glasslock engineered, designed, and installed a custom solution that provided glass fragment protection, reinforced window mullions and anchored frames to meet the government's required ISC/GSA blast performance specification. For the lobby curtain wall, GlassLock de-

GlassLock's professional staff has an extensive background in assessing risks and designing solutions for existing facilities, new construction or major renovation projects, including buildings with architectural or historical significance.

Design-Build Retrofit Assembly of curtainwall cable system and finished installation





signed a structural cable system that was anchored to the building's foundation and third floor deck infrastructure, then installed it keeping the architectural aesthetics and preexisting sight lines. This solution was completed within the existing Agency budget and with little to no effect on the occupants.



### Standing Up to the Test

#### GlassLock is the first company to conduct large-scale blast tests of retrofit safety film -to-glass products to Project Performance Worldwide the GSA/ISC Performance Criteria.

In 1996 our initial test were conducted in accordance with the first draft of the GSA/ISC Glazing Hazard Criteria guideline. Before these tests, there was no empirical data, just anecdotal information based on the past use of FRF by both the Department of State and the British government. GlassLock's experience and performance data were instrumental in the development of the current GSA/ISC Glazing Hazard Rating Criteria.

### A Note on "Balanced Design

Many people, including some engineers and architects, think of windows as just glass. Antiterrorism/Force Protection and Blast windows must be thought of as SYSTEMS. Window systems. Generally consist of:

- Glazing (glass or polycar-• bonate)
- Gaskets and Seals •
- Framing •
- Anchorages •
- Supporting Structures •

A "Balanced Design" is essential for window systems so that an Anti-terrorism/Force Protection

or Blast window is not attached to supporting structure that is significantly weaker than the glazing,

framing and anchorage of the whole. This approach is critical to ensure that the glazing is

the weakest link in the design and that it achieves the required level of performance



when combined with framing, anchorage and supporting structure. The entire premise of "Balanced Design" is to equalize the capacities of the window systems with the rest of the structure (walls building frame, roof, etc.). In this way the windows will achieve the required level of protection without

"Balanced Design" is recommended by blast engineering experts.

premature failure or without being negatively affected by the other structural components that are

significantly different in their behavior under load.

### GLASS LOCK DESIGNED PROTECTION TM

Since 1989, GlassLock has been providing designed solutions to clients nationwide and abroad

**Federal Government:** Bureau of Alcohol, Tobacco, Firearms and Explosives (ATF)

Department of State (DOS) Department of Housing and Urban De-

velopment

DOD-All components

Drug Enforcement Agency (DEA) Environmental Protection Agency (EPA) Federal Bureau of Investigation (FBI) Food and Drug Administration (FDA) General Services Administration (GSA) Inter-American Development Bank (IADB) Washington DC

Internal Revenue Service (IRS) National Gallery of Art, Washington DC National Park Service Office of Management and Budget Smithsonian Museums, Washington DC United States Court House, Washington DC

#### International:

American Consulate General, Florence American Embassy, Rome American Embassy, Stockholm American Embassy, Vatican City AmerikaHaus, Cologne United Kingdom Home Office United Kingdom Ministry of Defense

#### Major Corporate/Commercial:

Apple Computer, Inc. AOL BAE Hewlett-Packard IBM State of California State of Hawaii





Protecting the Homeland

#### GlassLock has the technical expertise and project

experience to provide custom protective glazing options to its customers seeking to improve physical security of existing window systems.



GlassLock is dedicated to continual investment in research, development, and live testing of its products. They have passed the rigorous ISC/GSA Security Criteria Blast Tests and can be tailored to meet required blast specifications. The Situation: The National Park Service at the Mount Rushmore National Monument was receiving threats from ecoterrorists on their newly constructed visitor's center and museum. The building had more than 35,000 square feet cladding that provided an expansive vista of the Monument.

The Solution: Working with the National Park

Service security department and the building architects, GlassLock fabricated and installed an attached Glass Fragment Retention System that secured the building and meeting the safety needs of its occupants.

**The Situation:** After 9/11 the Smithsonian institute needed to significantly upgrade the security of its many buildings that line the National Mall in Washington, DC. These major public venues host millions of visitors,



house priceless national treasures, and are architectural monuments in and of themselves.

**The Solution:** GlassLock worked closely with architects,

facility engineers, blast consultants and curators to custom design and install a unique protective glazing system solution for each of the Smithsonian buildings. This work was accomplished with minimal impact on public access to the museum collections.

#### **Blast Tests**

Unprotected (no FRF) and Protected (GlassLock Anchored FRF) Annealed glass exposed to 4psi, 28-30psi msec blast pressures.









Progression of Glass failure resulting in GSA Condition





# Custom Anchoring Systems for FRF

GlassLock offers two anchoring systems: a mechanical systems that uses an aluminum batten for anchoring the fragment retention film to the window frame, and a structural adhesive system.

Often fragment retention window film is applied directly to glass to reduce fragmentation hazards, but it also can be anchored to existing window frames to increase the overall performance of the glass. Anchoring to the frames helps keep the glass shards and the FRF within the window opening (depending on the size of the blast) and significantly reduces glass fragment hazards.

The mechanical anchoring system

#### Mechanical Anchoring

has been rigorously tested to IS-C/GSA Blast Security Criteria using various types of glass and window units. In this system the FRF is applied to the glass and wrapped onto the existing window frame. The film is anchored there with an aggressive transfer adhesive. The batten is bolted to the window frame, mechanically securing the film and glass in place.

A Cosmetic cap (anodized or painted to match the frame) is installed to cover the screws, batten and film, and a vinyl gasket is added to provide a clean, sharp appearance. The finished installation becomes part of the window system and is virtually invisible to building occupants.



#### Structural Adhesive

With the structural adhesive system the gaskets on the existing window unit are removed or cut to allow adhesive to extrude into the frame rebate (the gap between he glass and the frame). The FRF is applied to the glass and allowed to dry. Next, a black architectural structural hardening adhesive is applied over the film, over the existing window frame, and into the fame rebate. The adhesive is strictly applied following GSA standards to achieve the anchoring performance necessary to meet ISC/GSA Blast Security Criteria.

Typically, GlassLock clients specify the anchoring system and installation configuration preferred based on their needs. All clients are encouraged to have a qualified structural engineer with blast experience evaluate the existing frames, glazing unit assemblies, and the substrata of the existing windows before specifying an anchoring system.

*Every installation configuration is specific to the requirements of the site.* 





### Blast Protection and Physical Security

ForceDefender<sup>™</sup> windows and doors

offer the finest and most flexible ar-

chitectural solutions to your security

tested to meet an ISC/GSA Perfor-

mance Criteria Level 2 as-well-as

fenestration requirements. They

come in a primary and secondary

version, fixed or operable, with a customizable finish. They have been

provide Radio Frequen-(RF) attenuation

solution

countermeasures.

GlassLock's ForceDefender <sup>™</sup> window systems enhance security and offer blast protection to buildings, particularly those that place great emphasis on glass as an architectural element and design feature.

су

and

glazing

The ForceDefender<sup>™</sup> protective glazing systems included:

- Primary Windows
- Doors
- BlastBlinds<sup>™</sup>
- Store Fronts
- Catch Bar Systems
- Ballistic Resistant Glazing
- Mullion & Lobby Reinforcement
- Custom Masonry Anchors
- Fragment Retention Film

chitecturally significant requirements. These secondary windows are available in a fixed or operable configuration. The operable window is designed for easy access to the primary window for cleaning and maintenance.

GlassLock's architectural anchoring solutions provide a component to critical а "Balanced Design" solution that is often overlooked. The balanced design approach is to equalize the capacities of the glass, window frame and anchors with the rest of the structure (substrate, walls, structural frame, roof, etc.). GlassLock's systems can be design-built or retrofitted to meet architectural and structural requirements.



Protecting the Homeland one building at a time.

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### Blast Protection and Physical Security

Incorporated into new construction or as a retrofit solution, the ForceDefender<sup>™</sup> product line meets the challenging requirements demanded by today's security professionals and design engineers.







Interior Retrofit Blast Window



Operable Blast Window



Tilt and Turn Blast Window



**The Situation:** As part of a U.S. State Department initiative, officials at the U.S. Custom House in Philadelphia were required to increase security pro-

#### US Custom House Retrofit

tection for glass hazards. The building is on the National registrar of Historical Property. Its architectural integrity could no be compromised. There were twenty one original windows that could not be replaced or merely upgraded with standard glass fragment retention methods. Because GlassLock has experience installing protective window systems in architecturally significant and historic buildings, the GSA Regional Historic Officer was confident when choosing GlassLock to design and install the custom retrofit

window and anchoring system.

The Solution: GlassLock worked closely with the GSA Regional Historic Officer to design a custom solution using low profile secondary windows. This solution provided the desired level of glass hazard protection with no effect on the existing window system. The secondary windows did not interfere with the building's sight lines and they were unnoticeable to the building's occupants. From the outside there was no indication anything had changed. The historical character of the interior and exterior view had not been compromised. With Blast criteria met and original sight lines undisturbed, these unobtrusive window inserts also offered the added feature of energy efficiency and sound abatement to a historic building.

#### Windows and Doors

- Designed to project specifications
- New Replacement or insert
- Maintains historic façade
- Highest level of protection





# RF Attenuation and Wireless Security (802.11)

GlassLock's SpyGuard Technology provides customized film, glass and architectural surfaces for radio frequency (RF) Electromagnetic Interference (EMI) attenuation/eavesdropping countermeasures/wireless security and blast hazard reduction for physical security concerns.





Few people are fully aware of the threats of remote eavesdropping through window glass. Some of these methods are effective at distances up to or beyond a quarter mile. Proven eavesdropping methods are:

- Recording meetings and conversations using laser microphones
- Recording radio frequency emissions and the electromagnetic energy that leaks from computers, printers, facsimiles, cellular telephones, and other electronic devices.
- Capturing infra-red signals from wireless PDA's, laptops and IR communication systems.
- Capturing and translating optical bandwidth that emanates from computer displays to reconstruct the entire image on the monitor.

A recent (May 2005) GAO report concerning wireless security disclosed gaining access to over 1,000 wireless networks with in a 15 block area in Washington DC with just a common network scanner!

Significant "signal leakage" (wireless network signals traveling beyond an organization's perimeter) allowed for

#### Radio Frequency Attenuation



50dB attenuation to the wireless network signal.

By making wireless signals inaccessible, any miscues with respect to encryption, authentication, VPN and firewall rules are protected until they can be corrected. Example of multiple RF /EMI signals in an office environment below.



*In addition to providing wireless network protection, a significant extra benefit of the optically clear SpyGuard Technology is that it provides 50-75% total solar energy reduction (TSER). This equates to energy savings.* 

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GlassLock offers a complete product line of patented window solutions and architectural coatings called SpyGuard. Tested at highest government levels and proven to mitigate virtually all forms of electronic eavesdropping, SpyGuard products provide Tempest and Wireless (802.11) security requirements mitigation. Also available in fragment retention film and laminated glass, SpyGuard can provide total physical protection and information security in one installation.





**SpyGuard Architectural Coatings** — Brush it, roll it, or spray it on and dries within a few hours. When applied over a weekend, the only way one would know about it , is the lack of signal for your cell phone to work.

Initial tests involved the application of coatings to the perimeter of what are called Sensitive Compartmented Information Facilities (SCIF); wireless devices and other sensitive electronic gear in the structures were protected from unauthorized access. The coating has been tested over a 3-year period.

The tests utilizing the coating were ini-

#### Radio Frequency Attenuation

tially carried out to aid U.S. defense and intelligence agencies to safeguard mission critical information. The results showed that a one-time application of the coating creates an electromagnetic fortress by preventing airborne hackers from intercepting signals. Airborne hacking is usually undetectable and untraceable.

**SpyGuard** Glass and Architectural Surface Coatings have many uses in the private and/or commercial sector; areas where wireless LANS are deployed and areas where cell phone use is not wanted.

Electromagnetic signals which if properly intercepted and processed will allow certain amounts of information to be reconstructed base on these compromising emanations. Basically, anything with a microchip, diode, or transistor,



gives off these fields. Fax machines, computer monitors, external disc drives, CD-R drives, scanners, printers and other high bandwidth peripherals can be a very serious problem.

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