SPECIFICATION GUIDE

Security Glazing Systems

A Technical Reference for Architects Specifying Protective Glass and Film Solutions

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Applicable Standards:

ASTM F3561 | UL 752 | ASTM F588 | GSA-TS01

Executive Summary

Glass is one of the most exploitable vulnerabilities in any building envelope. Yet for architects, specifying the right glazing security solution — security window film, engineered polycarbonate overlay, or bullet-rated glass — requires navigating a landscape filled with misleading product claims, inconsistent testing standards, and significant consequences for misjudgment.

This guide distills the essential technical knowledge architects need to specify security glazing products correctly. It clarifies what security window film can and cannot do, defines the testing standards that matter, explains when engineered solutions are required, and outlines installation requirements that determine real-world system performance.

> **Core Principle for Specifiers**
> Security window film is a delay mechanism — it buys time for occupant response. It is not a ballistic barrier. For true bullet resistance, architects must specify engineered systems tested to UL 752 or ASTM F3561. Specifying the wrong product tier for the threat environment creates false security and potential liability.

1. Understanding the Glass Vulnerability

Standard architectural glass — annealed, tempered, or insulated — offers minimal resistance to forced entry, ballistic impact, or blast overpressure. Understanding glass failure modes is the foundation of informed specification:

- **Annealed glass:** Annealed glass shatters into large, laceration-causing shards on impact.
- **Tempered glass:** Tempered glass fragments into small pieces — faster and more completely than annealed — making film-based delayed entry harder to achieve.
- **Laminated glass:** Laminated glass (PVB or SGP interlayer) holds fragments together and forms the structural basis of true bullet-rated glazing units.

The critical insight for architects: film-based security products perform very differently depending on the glass substrate to which they are applied. A film system specified for tempered glass will not perform identically to the same film on annealed glass. Substrate type must be documented in the specification.

> **Specifier Note**
> Always identify existing glass type before specifying security film as a retrofit. Request glass compatibility testing from the installer. Film warranties are typically void if applied to incompatible substrates, and performance testing conducted on non-representative substrates is not valid for specification purposes.

2. Security Window Film — Capabilities and Limitations

2.1 What Security Film Does

Security window film is a multi-layer polyester (PET) film bonded to the interior glass surface using aggressive pressure-sensitive adhesives. When glass is struck and fractures, the film holds fragments in place, preventing dangerous glass spall and slowing attacker ingress.

Properly specified and installed, security film provides:

- Fragment retention — holds glass shards to prevent injury from spalling
- Forced entry delay — under sustained attack with blunt instruments, well-anchored film systems can delay breach by several minutes
- Blast spall mitigation — film systems meeting GSA-TS01 hold glass against blast overpressure, reducing interior hazard
- Solar control — tinted film options simultaneously reduce HVAC load, offsetting installed cost

2.2 Critical Limitations for Specification

Architects must understand and document these limitations when specifying security film:

- **Not ballistic:** Security film is NOT a ballistic barrier. No security window film product — regardless of thickness — is rated to stop bullets when applied to standard architectural glass. The IWFA, 3M, Madico, and other major manufacturers explicitly state this. Bullet appears to stop in some demonstrations because of specific glass types or ammunition used — not film performance.
- **System dependency:** Film alone does not constitute a 'system.' Performance depends on glass type, film thickness, anchoring caulk specification, edge integrity, and frame condition.
- **No field stacking:** 'Stacking' multiple film layers in the field to increase protection voids most manufacturer warranties and introduces optical and adhesion problems.
- **Substrate matters:** Film on tempered glass offers substantially less forced-entry resistance than film on annealed glass, due to tempered glass's rapid and complete fracture pattern.

> **Warning: 'Bulletproof Film' Claims**
>
> A 2023 Wall Street Journal investigation documented school districts across the U.S. spending millions on film systems marketed as 'bulletproof.' These claims are not supported by any recognized ballistic testing standard. Architects who specify or approve such systems without verifying independent third-party testing to UL 752 or ASTM F3561 expose their clients — and potentially themselves — to significant liability. Demand test reports from accredited labs (e.g., Intertek, UL). Never accept YouTube demonstrations as performance validation.

3. Testing Standards Architects Must Know

Specifying security glazing by performance standard — not product name — is the correct approach. The following table summarizes the standards relevant to security glazing specification:

Standard	Scope	Application	Relevance to Architects
ASTM F3561	Ballistic + forced entry combined	School / public buildings	Highest priority for new spec
UL 752	Ballistic resistance levels 1–8	BRG, BulletShield	Required for true ballistic products
ASTM F588	Forced entry — window systems	Security film + film systems	Baseline forced-entry spec
GSA-TS01 / ASTM F1642	Blast mitigation	Gov't / critical infrastructure	Fed / municipal projects
ASTM F1233	Multi-threat: ballistic + FE	High-security facilities	Spec when combined threats exist

3.1 ASTM F3561 — The New Benchmark

ASTM F3561 (Standard Test Method for Forced-Entry Resistance of Fenestration Systems After Simulated Active Shooter Attack) is the most relevant standard for schools, houses of worship, and other active-shooter-risk environments. It combines ballistic impact with forced-entry testing — specifically evaluating whether an attacker can breach the assembly after shooting through it.

DefenseLite polycarbonate overlay systems have been tested and rated under ASTM F3561. Standard security film alone does not pass this test as a primary component.

3.2 UL 752 — Ballistic Protection

UL 752 defines eight protection levels based on weapon type and caliber, from Level 1 (9mm handgun, 3 rounds) through Level 8 (7.62mm NATO rifle). BulletShield is independently tested to UL 752 Level 7 (AR-15 / .223 caliber). Any product marketed for ballistic protection must have a UL 752 test report from an accredited third-party laboratory.

3.3 GSA-TS01 / ASTM F1642 — Blast

For federal buildings, courthouses, and high-profile infrastructure, the General Services Administration requires blast testing per GSA-TS01-2003 and ASTM F1642. High-quality film systems with anchoring caulk (Dow 995 or 3M IPA) can achieve GSA Level 3B. Architects specifying for federal occupancies should confirm GSA Acceptance levels with the AHJ.

4. System Components That Drive Performance

Security film performance is a function of the complete system, not film thickness alone. Architects specifying film systems must address all of the following in project documents:

4.1 Anchoring Caulk — Critical and Often Omitted

Structural silicone sealant (Dow 995 or 3M IPA) applied at the film-to-glazing-frame perimeter is not optional — it is the mechanism by which the film transfers impact load to the frame. Without proper anchoring caulk:

- The film-glass assembly can be pried away from the frame under sustained attack
- Blast overpressure will cause the filmed glass to bow outward and separate
- Edge delamination accelerates over time, reducing long-term performance

Specification language must require a minimum bite of caulk on both the film edge and the glazing frame, continuous application with no voids, and a 24–48 hour initial cure time (full structural cure takes 2–4 weeks depending on temperature and UV exposure).

4.2 Edge Integrity and CNC Cutting

Field-trimmed film creates micro-tears at the cut edge that propagate under stress. Precision CNC cutting to exact glass opening dimensions preserves the tear strength of the film at its most vulnerable location.

Architects specifying high-performance film systems (e.g., 14 mil or heavier) should require factory CNC cutting in specification language. Systems like RiotLite are specifically designed with factory-controlled edges for optimal performance.

4.3 Film Thickness Selection

Film ranges from 2 mil (light shatter resistance) to 27 mil (heavy-gauge forced entry delay). Thicker is not automatically better — flexibility, adhesion, and optical clarity all decrease with increasing thickness. Performance is determined by material composition and system design, not thickness alone.

> **Specification Tip**
>
> Use a performance specification, not a prescriptive one. Specify 'security window film system achieving ASTM F588 Grade 40 (or higher) with anchoring caulk, CNC-cut edges, and minimum [X] mil film thickness' rather than a named product. This approach ensures competitive bidding while maintaining performance accountability.

5. Engineered Systems for Higher Threat Environments

When the design threat level exceeds the capability of security film — particularly when active shooter risk exists — architects must specify engineered glazing solutions. Two primary retrofit systems are relevant:

5.1 DefenseLite — Polycarbonate Overlay System

DefenseLite is an architectural-grade polycarbonate shield and aluminum framing system that mounts to existing window and door frames as a secondary glazing layer. Unlike security film, which is applied to the existing glass surface, DefenseLite creates a structurally independent protective layer.

Key specification data:

- Tested to ASTM F3561 (active shooter / forced entry combined) Level 8
- Tested to ASTM F588 Grade 40 forced entry resistance
- Mounts to existing frame — no glass replacement required
- Available in clear polycarbonate, maintaining daylight and outward views
- Integrates with existing security film for layered protection

5.2 BulletShield — Ballistic Glazing Retrofit

BulletShield is a custom-fabricated ballistic glazing system that replaces the vision glass in existing frames — the most vulnerable component of any glazing assembly. It is designed for environments where ballistic protection is non-negotiable: schools, courthouses, police stations, hospitals, and government buildings.

Key specification data:

- Independently tested to UL 752 Level 1-7 (AR-15, .223 caliber, 5 rounds)
- Meets HP White TP 0500.03 Level A-3 (.38 Special)
- Custom fabricated to existing frame dimensions — field replacement of vision lite only
- Available in transaction window configurations (counter barriers) for retail and financial applications
- Can be combined with security film on interior and exterior surfaces

> **Design Consideration**
> BulletShield and DefenseLite are not interchangeable. DefenseLite provides superior forced-entry resistance and meets ASTM F3561; BulletShield provides ballistic stop capability to UL 752. For the highest-threat environments (e.g., schools with vestibule security, police stations), a layered specification may include both.

6. Product Selection Matrix

Use the matrix below to align product selection with threat environment and project constraints:

Solution	Forced Entry	Blast	Ballistic	Retrofit?	Cost Tier
Security Film	Delays (minutes)	Spall control	None on own	Yes	$
DefenseLite	Stops (ASTM F3561 Gr.8)	Partial	Blunt force only	Yes	$$
BulletShield	Stops	Yes	UL 752 Lvl 7	Yes	$$$

Bullet-Rated Glass	Stops	Engineered	UL 752 Lvl 1–8	Replacement only	$$$$

Cost tier guide: $ = $15–35/SF installed | $$ = $35–80/SF | $$$ = $80–140/SF | $$$$ = $190–400/SF (includes labor)

7. Specification Language and Common Errors

7.1 What to Include in the Specification

- Glass substrate type and thickness (verified field measurement required)
- Film or Shield product: manufacturer, thickness (mil), and series designation
- Anchoring caulk: structural silicone (Dow 995 or approved equal), application width and bite
- Edge treatment: CNC pre-cut to opening dimensions required for films ≥ 8 mil
- Testing standard and performance level (e.g., ASTM F588 Grade 40)
- Installer certification: IWFA member, manufacturer-certified installer required
- Warranty: manufacturer warranty registered within 30 days of installation
- Cure time: no cleaning or disturbance for minimum 30 days post-installation

7.2 Top Specification Errors

The following errors are commonly observed in glazing security specifications and should be avoided:

- **Error 1:** Specifying film as 'ballistic protection' without a UL 752 test report. Film alone has no ballistic rating.
- **Error 2:** Omitting anchoring caulk from the specification. Without it, the film system will not perform as designed under sustained attack or blast.
- **Error 3:** Accepting YouTube demonstrations as performance evidence. Test data from accredited third-party labs is the only valid basis for specification.
- **Error 4:** Using the same spec for new and retrofit applications without confirming glass substrate and frame compatibility.
- **Error 5:** Specifying film thickness (e.g., '14 mil minimum') without a performance standard. Thickness is not a proxy for performance.
- **Error 6:** Failing to require installer certification. Even a correctly specified film system will underperform if installed by an uncertified applicator.

8. Negligent Security and Design Liability

When a security assessment, prior incident, or code review identifies a glazing vulnerability, the architect's obligation does not end with documentation. U.S. premises liability law holds that once a hazard is foreseeable, failure to take reasonable corrective action — when cost-effective measures exist — creates legal exposure.

Courts evaluating negligent security claims examine four elements:

- Foreseeability: Was the risk known or knowable at the time of design?
- Reasonable standard of care: Did the specifier exercise the care expected of a qualified professional?
- Causation: Did the inadequate specification contribute to the harm?
- Damages: What measurable harm resulted?

For architects, the practical implication is this: specifying a film system marketed as 'bullet-resistant' without verifying independent ballistic test data is not defensible. Courts and expert witnesses in negligent security cases are well-versed in the distinction between marketing language and engineering performance.

> **Risk Management Guidance**
> When security glazing is in scope, document your specification process. Retain third-party test reports for specified products. Ensure the specification requires IWFA-certified installers and registered warranties. If a client declines a higher-performing specified solution for cost reasons, document the decision and the performance trade-off in writing.

9. Procurement and Funding Pathways

Security glazing projects are often eligible for grant funding, particularly in schools, houses of worship, and municipal buildings. Architects advising clients on project feasibility should be aware of the following sources:

- COPS School Violence Prevention Program (U.S. DOJ): Covers security upgrades including glazing systems at K–12 facilities. Contact: 800-421-6770 / askCopsRC@usdoj.gov
- FEMA Homeland Security Grant Program (HSGP): State and local infrastructure security — coordinate through State Administrative Agency (SAA) per FEMA preparedness guidelines.
- U.S. Department of Education Safe Schools Grants: Discretionary grants for physical security infrastructure at schools.
- Community Development Block Grants (CDBG): Federal funds administrated locally — can be allocated to public building security improvements.
- Private insurance rebates: Some carriers offer premium reductions or installation rebates for documented security upgrades. Recommend clients consult their broker.

The SchoolSafety.gov grants finder tool provides a searchable database of active funding opportunities specifically tailored to educational facilities.

10. Quick-Reference Checklist for Specifiers

Use this checklist when developing security glazing specifications:

☐	Identify and document glass substrate type (annealed / tempered / laminated) and thickness for each opening
☐	Define design threat level: forced entry only, blast, or active shooter / ballistic
☐	Select appropriate product tier based on threat (film / DefenseLite / BulletShield / BRG)
☐	Specify performance standard, not product name (ASTM F3561, UL 752, ASTM F588)
☐	Require independent third-party test reports (Intertek, UL, or equivalent accredited lab)
☐	Include anchoring caulk requirement: Dow 995 or 3M IPA, continuous bead, verified bite
☐	Require CNC pre-cut film for films ≥ 8 mil
☐	Require IWFA-certified installer and manufacturer certification
☐	Include warranty registration requirement (30 days post-installation)
☐	Review with AHJ if project is subject to GSA, IBC security provisions, or state school safety mandates
☐	Document client decisions to downgrade specified performance in writing
☐	Advise client on applicable grant funding pathways where relevant

Key Resources and Contacts

Industry Organizations

- International Window Film Association (IWFA): iwfa.com — installer certification, product position statements, industry standards
- ASTM International: astm.org — F3561, F588, F1233, F1642 test standards
- Underwriters Laboratories: ul.com — UL 752 ballistic resistance certification
- National Glass Association (NGA): glass.org — glazing industry standards and advocacy

Technical Contact

For technical specification assistance related to BulletShield and DefenseLite systems:

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