

Security Glazing Specification

1 General

This glazing specification outlines the general considerations for glazing as used in security glazing applications (ballistic, bomb blast and burglary resistance).

2 Materials Minimum requirements

Glass shall meet minimum requirements as specified in American Society of Testing and Materials (ASTM) Standards: ASTM C1036, C1048, C1376 and C1172 with insulating glass units meeting ASTM E 773 and 774 as applicable.

Plastic glazing materials shall meet the minimum requirements as specified in _____.

Security Window Film materials shall meet the minimum requirements as specified in _____.

Accessory protective materials shall meet the minimum requirements as specified in _____.

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3.1 Dimensions

Lites of overall dimensions ($\frac{x}{\text{Width} \quad \text{Height}}$) inches / mm.

3.2 Unit Type

- W** Monolithic lite
- W** Insulating Glass Unit (two or more monolithic lites separated by an air space)
- W** Single laminated lite (glass plies with adhesive interlayer)
- W** Laminated insulating unit (monolithic glass/air space/ Laminate with adhesive interlayer)
- W** Double laminated insulating unit (laminate with adhesive interlayer/air space/ Laminate with adhesive interlayer)
- W** Security Window Film (PET film with adhesive applied to inboard glass)
- W** Blast Shields/Curtains (interior mounted product that catches broken glass fragments)
- W** Laminated Plastic Glazing (Polycarbonate, Acrylic or other plastic laminated with an adhesive to another sheet of plastic or glass)

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3.3 Glazing Configuration:

	Thickness	Material Type	Color/Coating/Product ID
Layer #1:	(<input type="text"/>) <small>inch/mm</small>	(AN, HS, CT, FT, PC); <small>Type</small>	(<input type="text"/>) <small>code number</small>
Adhesive Layer:	(<input type="text"/>) <small>inch/mm</small>	(PVB, PU, EVA, Resin) <small>interlayer type</small>	(<input type="text"/>) <small>code number</small>
Layer #2*:	(<input type="text"/>) <small>inch/mm</small>	(AN, HS, CT, FT, PC); <small>Type</small>	(<input type="text"/>) <small>code number</small>
Adhesive Layer:	(<input type="text"/>) <small>inch/mm</small>	(PVB, PU, EVA, Resin) <small>interlayer type</small>	(<input type="text"/>) <small>code number</small>
Layer #3*:	(<input type="text"/>) <small>inch/mm</small>	(AN, HS, CT, FT, PC); <small>Type</small>	(<input type="text"/>) <small>code number</small>
Insulating Space: (<input type="text"/>) <small>inch/mm</small> ; (air, argon, krypton, SF ₆) <small>Gas Type</small>			
Layer #1:	(<input type="text"/>) <small>inch/mm</small>	(AN, HS, CT, FT, PC); <small>Type</small>	(<input type="text"/>) <small>code number</small>
Adhesive Layer:	(<input type="text"/>) <small>inch/mm</small>	(PVB, PU, EVA, Resin) <small>interlayer type</small>	(<input type="text"/>) <small>code number</small>
Layer #2*:	(<input type="text"/>) <small>inch/mm</small>	(AN, HS, CT, FT, PC); <small>Type</small>	(<input type="text"/>) <small>code number</small>
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Layer #3*:	(<input type="text"/>) <small>inch/mm</small>	(AN, HS, CT, FT, PC); <small>Type</small>	(<input type="text"/>) <small>code number</small>

** for multi-ply lites add adhesive layer and glass or plastic layers as necessary.*

4 Security Window Film

4.1 Dimensions

Thickness () inches/mm
 Width () inches/mm

4.2 Application type

- w Daylight
- w Edge to Edge
- w Anchored (1, 2, 3, or 4 Sides) with ()
Anchoring Mechanism

5 Accessories

5.1 Dimensions

Height () inches/mm
 Width () inches/mm

5.2 Product type

- W** Blast Curtains
- W** Blast Shields

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6 Security Glass Performance Criteria:

6.1 Burglary resistant glass:

Glass shall be capable at a minimum of meeting:

- ▀ ASTM F1233 class (_____) with (no body passage/ no contraband passage).
- ▀ UL 972

6.2 Bullet resistant glass:

Glass shall be capable at a minimum of meeting:

- ▀ ASTM F 1233 class (_____) with (no bullet penetration / no spall)
- ▀ UL 752 level (_____)

6.3 Blast resistant glass:

Glass shall be capable at a minimum of meeting:

- ▀ ASTM F 1642
- ▀ Glass Fragmentation Condition (_____) while withstanding
Figure 1 below
(_____) psi peak overpressure at
enter value
(_____) psi*msec impulse.
enter value

6.4 Electronic Security Glazing:

Glass shall be capable at a minimum of meeting:

- ▀ Radio frequency attenuation of (_____) dB over the frequency range from
enter value
(_____) MHz to (_____) MHz.
enter value enter value

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6 Additional Performance Specifications

6.1 Safety Glass:

Glass shall be capable at a minimum of meeting:

- CPSC 16 CFR 1201 Cat II
- ANSI Z97.1

6.2 Sound Control Glass:

Glass shall be capable of achieving an single number sound control rating of:

- STC ()
enter value
- OITC ()
enter value
- Rw ()
enter value

6.3 Solar/Thermal Control Glass:

Glass shall be capable of achieving:

- Visible Light Transmittance () %.
enter value
- Solar Heat Gain Coefficient ()
enter value
- Shading Coefficient ()
enter value
- Maximum UV radiation transmittance of <0.1% below 380 nm.
- Damage Weighted Transmission (Tdw from LBL Window 4.1) of < 0.36
- Laminating Insulating glass units shall have the laminate installed inboard

6.4 Hurricane Mitigation

Glass shall be capable of at a minimum meeting:

- ASTM E 1996 () missile at () psf.
missile size: Large or Small +/- pressure
- SFBC PA 201/203 for () missile at () psf.
missile size: Large or Small +/- pressure
- SSTD-12 for () missile at () psf.
missile size: Large or Small +/- pressure
- TDI – 1-98 for () missile at () psf.
missile size: Large or Small +/- pressure

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7 Specification Appendix:

A.1 Fenestration Performance Criteria – Bomb Blast

Fenestration systems (glazing, frames, anchorage to supporting walls, etc.) on the exterior facade shall be designed to mitigate the potentially lethal effects of flying glass following an explosive event. This design shall balance the features of the glazing, framing, and attachments with the capacity of the supporting structural walls. That is, the supporting walls, anchorage, and window framing shall be designed to fully develop the capacity of the glazing material selected.

Performance levels shall be based on the design criteria and risk assessment of the building in accordance with the minimum protection conditions presented in Table 1 and graphically depicted in Figure 1.

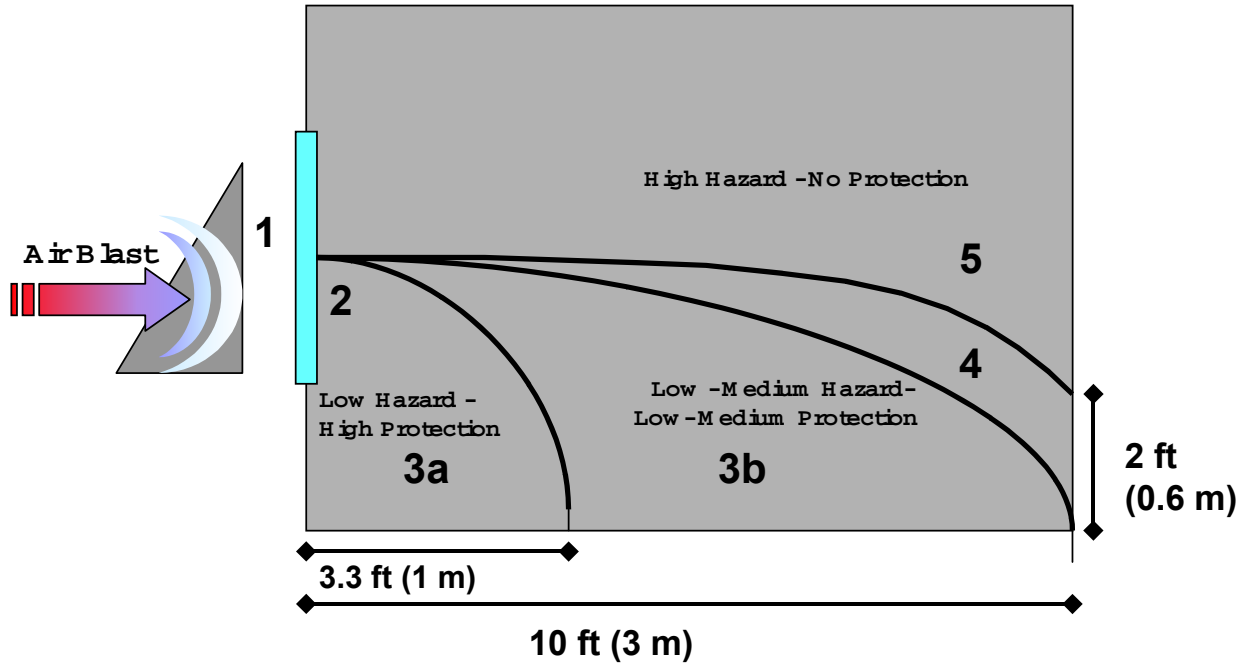
In special areas of certain buildings, there may be requirements for protection for pedestrians outside the building during a blast event or protection from forced entry and/or ballistic assault. In these cases, these specially designed glazings are acceptable provided that they also meet or exceed the minimum protection levels specified in Table 1.

Table 1: Glazing protection levels based on fragment impact locations.

Condition	Description	Glass Fragments		Hazard Level	Protection Level
		Exterior to Structure	Interior to Structure		
1	Glazing not cracked, fully survived and/or fully retained by frame and no glass fragments either inside or outside structure.	None	None	NA	Very high
2	Glazing may be cracked but is retained within the same plane of the frame.	Yes	No significant fragments. Dusting or very small fragments near sill or on floor acceptable.	Very Low	Very High
3	Glazing cracked and not completely retained in frame.	Yes	Yes – Pieces of glazing land on floor no more than 10 ft from window	Low	High
4	Glazing cracked and not retained in frame.	Yes	Yes – Pieces of glazing land on floor more than 10 ft from glazed opening. A vertical surface located not more than 10 ft behind the glazed opening is impacted by fragments no higher than 2 ft above floor level.	Medium	Medium
5	Glazing fails catastrophically.	Yes	Yes – pieces of glazing land on floor more than 10 ft from glazed opening and impact a vertical surface not more than 10 ft behind glazed opening above a height of 2 ft.	High	None

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Figure 1 – Graphical depiction of glass fragment impact locations.



A.3 Delivery, Storage, Handling and installation -
Glazing products shall be delivered, stored and handled in accordance with manufacturer's instructions. Standard industry practice for proper installation including weeping of systems according to manufacturer instructions.