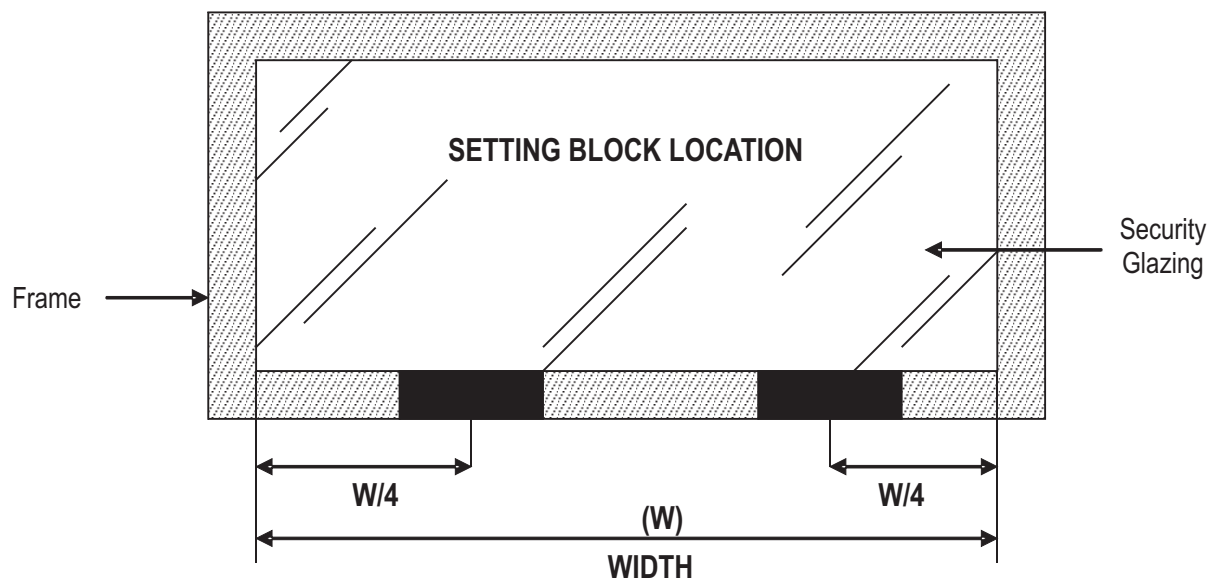


General Glazing Installation Guidelines For Security Products

All Security products are to be installed in accordance with acceptable industry glazing standards as published in the Glass Association of North America (GANA) Glazing Manual. Normal installation should follow trade-glazing guidelines using skilled, professional techniques. Special care must be employed in the design and selection of the type of security glass used and its location. The frame and installation should be equivalent to the ballistics, blast and/or attack rating of the glass. Frames and gaskets should be designed for support and to allow expansion without any mechanical stress on the glass. The following information has been prepared to aid in the design and installation of these products.

Figure 1
Front View of Glazing in Frame



SETTING BLOCKS

All security products made from glass plies must be supported by two setting blocks.

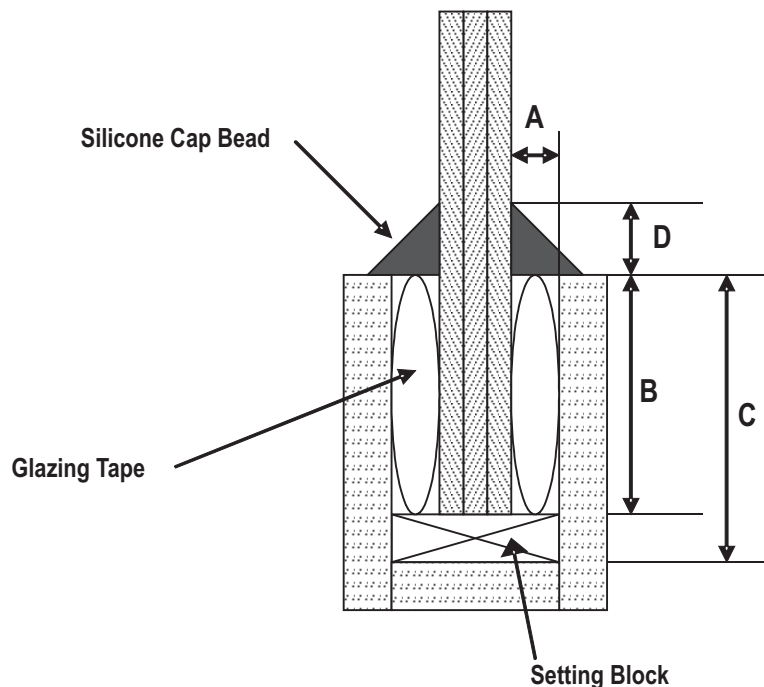
- Setting blocks should be placed at the quarter points. (See Figure 1) For glass widths of 32" or greater, edge of block should be no less than 6" from corner of glass.
- Setting blocks should have a shore A durometer of 85 ± 5 .
- Setting blocks must be of a material compatible to glass / polycarbonate / polyurethane laminates. Santoprene, Silicone and EPDM are recommended. Neoprene should be avoided, as it is incompatible with polycarbonates.
- Setting block length = 0.1 inch per square foot of glass area (4" minimum for glass widths of 32" or greater).
- Setting block width = channel $-1/16"$.
- Setting block height = $1/4"$ Minimum

General Glazing Installation Guidelines For Security Products (cont.)

FRAME CLEARANCE

Frame tolerances, for all glass and glass/polycarbonate laminates, should be designed to allow for the dimensional, bow and warp tolerance as set forth in ASTM C 1172 or ASTM C 1349 accordingly. Thickness tolerance will vary with each product and are available upon request. Dlubak Corporation recommends a minimum face clearance of 1/8" (1/4" for all products containing Polycarbonate), a minimum silicone bead of 1/4", a minimum glass bite of 1" (see Figure 2) and a minimum edge clearance of 1/4". It is important to note that all polycarbonate laminates will have a higher expansion rate than glass or glass/polycarbonate laminates. For this reason special care should be taken to ensure there is proper edge clearance in the framing system to allow for this expansion. As a general guideline, glazing systems for all polycarbonate laminates should be designed to allow an edge clearance of 1/16" per lineal foot of length and width or 1/4" minimum, whichever is greater. If the glazing system requires edge blocks or anti-walk blocks, a 1/8" clearance is recommended between the glass edge and the edge block. Security Systems such as Bullet Resistant, Blast Resistant or Forced Entry may require specified edge engagement other than 'typical' as shown. Follow Frame Manufacturer and/or Architectural specifications; ensure all materials are compatible.

Figure 2
Typical Edge Engagement



- A. Face Clearance: 1/8" to 1/4", Note: Minimum of 1/4" for all products containing Polycarbonate
- B. Edge Engagement "Bite": 1"
- C. Rabbet Depth: 1-1/4" Min. for all glass, glass/polycarbonate, and all polycarbonate laminates
- D. Silicone: 1/4" minimum depth. For maximum watershed add 1/16".

General Glazing Installation Guidelines For Security Products (cont.)

GLAZING TAPE

Use only Recommended Tapes and Gaskets. A pre-shimmed glazing tape is recommended to cushion laminate and seal the frame. Foam strips or backer rod can also be used. The glazing tape should be applied to both sides of the laminate in continuous strips around the edge. The laminate is then centered in the frame and the retention stops set in place. Care must be taken to avoid excessive clamping pressure against the edges of the laminate, as this could result in breakage.

It must also be noted that Dlubak warns against the use of PVC gasket material with any laminate that contains polycarbonate due to material incompatibilities.

Recommended Tapes and Gaskets

<u>Type</u>	<u>Product Name</u>	<u>Manufacture</u>
Gasket/Tape	Norrene® Foam V-2100 Urethane	Norton Company Granville, NY 518-642-2200
Gasket	EPDM 60D, 70D	Tremco Columbus, OH 800-321-6357
Tape	440 Tape	Tremco Beechwood, OH 800-321-7906
Butyl Tape	Isocryl 5600	Schnee-Moorehead Irving, TX 214-438-9111

Many other glazing materials are commercially available which are compatible with Polycarbonate Sheet. Please contact those manufacturers for their recommended products.

Trademate® is a registered trademark of Dow-Corning Corp. Silpruf® is a registered trademark of General Electric Company. Norrene® is a registered trademark of Norton Company.

SEALANT BEAD

Use only Recommended Silicones. A silicone sealant cap bead must be applied between the laminate surface and the frame. This acts as a weather seal for exterior applications, but is also necessary for interior applications to seal out any moisture from cleaning solutions or other sources.

- Ensure the entire glazing channel is clean. Clean the glass and frame surfaces per Dlubak Corporation "Cleaning instructions". Prep metal surfaces as recommended by sealant manufacture.
- The silicone cap bead is required around the entire glass/frame perimeter. The cap bead must be a minimum of 1/4"; 5/16" is recommended for maximum watershed.
- Sealant Manufacture should be contacted to verify compatibility of the sealant with laminated security glazing.

General Glazing Installation Guidelines For Security Products (cont.)

Recommended Silicones		
Type	Product Name	Manufacture
Silicone Sealant	Dow 795 Dow 999 Trademate®	Dow-Corning Corp Midland, MI 517-496-4000
Silicone Sealant	Silpruf® Sealant Construction 1200	General Electric Co. Waterford, NY 800-255-8886
Silicone Sealant	Spectrem	Tremco Columbus, OH 800-321-7906

WEEP SYSTEM

Exterior windows must be designed to use a proper weep system. The edges of security glass must not be exposed to standing water. This could cause premature failure in laminated and insulated units. It is recognized that these features are controlled by the glazing system manufacturer or designer, when it's obvious that the glazing system will not meet these requirements, the matter should be brought to the attention of the General Contractor.

GENERAL NOTES

The edges of laminates with PVB (Polyvinyl Butyral) Interlayers, must not be exposed to organic solvents, which can react with the plastic interlayer. This includes but is not limited to, Naphtha VM&P Grade, Isopropyl Alcohol, Kerosene, Petroleum Spirits, or any Aliphatic Hydrocarbons.

Laminates should remain masked until construction complete.

When installing security glass products, check each laminate for "threat" and "protected" side. Security glazing may be asymmetrical in construction and will offer the rated protection from the threat side only.

The enclosed constitutes general guidelines only. For more glazing details refer to the Glass Association of North America (GANA) Glazing Manual and the architectural specifications.

It is the installer's ultimate responsibility to insure that all glazing materials (including but not limited to; sealants, silicones, tapes, gaskets and setting blocks) are compatible. If delamination or damage occurs due to the use of incompatible materials our warranty will be null and void.

For more information please contact Dlubak Corporation at 724-459-9540, to speak our engineering staff.