



Product Evaluation

SHU122 | 1214

Engineering Services Program

The following product has been evaluated for compliance with the wind loads specified in the International Residential Code (IRC) and the International Building Code (IBC).

This product evaluation is not an endorsement of this product or a recommendation that this product be used. The Texas Department of Insurance has not authorized the use of any information contained in the product evaluation for advertising, or other commercial or promotional purpose.

This product evaluation is intended for use by those individuals who are following the design wind load criteria in Chapter 3 of the IRC and Section 1609 of the IBC. The design loads determined for the building or structure shall not exceed the design load rating specified for the products shown in the limitations section of this product evaluation. This product evaluation does not relieve a Texas licensed engineer of his responsibilities as outlined in the Texas Insurance Code, the Texas Administrative Code, and the Texas Engineering Practice Act.

For more information, contact TDI Engineering Services Program at (800) 248-6032.

Evaluation ID: SHU-122

Effective Date: December 1, 2014

Re-evaluation Date: December 2018

Product Name: Plylox Clips Based Wood Structural Panel Shutter Systems

Manufacturer: Plylox
P.O. Box 1749
Friendswood, TX 77549-1749
(800) 583-4289

Product Description:

Plylox™ clips are used for the attachment of wood structural panels (plywood) to recessed window openings for protection from windborne debris.

Plylox designed the Plylox™ clips to work with wood structural panels (plywood) with 15/32" thickness. Use the Plylox™ clips to attach the plywood panels to recessed openings constructed with a wood, stucco, or brick exterior finish. Install the Plylox™ based wood structural panel shutter systems on the exterior side of the building.

The shape of the Plylox™ clip is designed to provide resistance to forces that tend to pull the wood structural panels from the recessed openings due to wind pressures acting on the wood structural panels. Install the Plylox™ clips with a modest amount of force into a recessed opening. The toothed leg of the clip embedding into the exterior finish material of the recessed opening (wood, stucco, or brick) causes the initial gripping action of the clip. As outward acting wind pressure is applied to the wood structural panels, the resulting compressive forces on the clips cause the toothed legs of the clips to further embed into the finish material of the recessed opening. This action resists the outward movement of the wood structural panels. Inward acting wind pressures are resisted by the wood structural panels bearing on the perimeter frame of the recessed opening product.

Consider the Plylox™ based wood structural panel shutter system specified in this report as temporary. They are intended to be mounted only prior to a windstorm event and should be removed from the building following the windstorm event. To permit a quick and efficient installation, label the shutters to

indicate the locations of the openings on the building they are protecting. Store the pre-cut plywood panels, Plylox™ clips, and installation instructions in a permanent dry location.

Plylox™ Clips:

The Plylox™ clip is cold-formed from strapping steel by Signode. The clips are nominal 1.25" in width and have a nominal thickness of 0.029". The standard clip has a long leg, with the toothed edge, of 1.88". A shorter clip (with a long, toothed edged, leg of 1.63") is available. Use the shorter clip to resist higher wind pressures.

The clips must be corrosion resistant as required by the Texas Revisions.

Impact Resistance:

Impact Resistant	Requirement
Yes	These products satisfy TDI's criteria for protection from windborne debris in the Inland and Seaward zone. Install the assemblies at a height on the structure that does not exceed the design pressure rating for the assemblies and the building height specified in this evaluation report.

Limitations:

- **Product Identification:** The Plylox™ clips must have the word "Plylox" etched into the surface of the long, toothed edged, leg of the clip.
- **Shutter Panels:** Wood structural panels must be 15/32" plywood complying with the provisions of either U.S. Department of Commerce Voluntary Product Standard 1 (PS 1) *Construction and Industrial Plywood*, U.S. Department of Commerce Voluntary Product Standard 2 (PS 2) *Performance Standard for Wood-Based Structural- Use Panels*, or APA PRP-108, *Performance Standards and Policies for Structural-Use Panels*.
- Do not use oriented strand board (OSB) for shutter panels.
- Do not use a plywood panel thinner or thicker than 15/32".
- **Building Height:** Install the shutters on one- or two-story buildings only. For building on piles, only install the shutters if the building has a perimeter deck which permits safe installation.
- **Allowable Shutter Span:** The allowable shutter span (distance between vertical lines of Plylox™ clips) must not exceed 4'-0".
- **Allowable Shutter Length:** No limit. Place two or more plywood panels next to each other to form a longer shutter. When placing panels next to each other, reinforce the horizontal seams (butt ends of panels). Reinforce the panels with minimum 2x4 Spruce-Pine-Fir wood stiffeners secured to the shutter panels with fasteners. Orient the 2x4 wood stiffeners parallel to the long dimension of the shutter and extend the length of the shutter. Attach the 2x4 stiffeners to the outside surface of the shutter with the small dimension (1-1/2" dimension) bearing against the shutter. Use a minimum of one 2x4 stiffener for shutter spans 24" or less (located at the midspan of the shutter) and use a minimum of two 2x4 stiffeners for shutter spans up to 48" (equally spaced across the shutter span). Secure the stiffeners to the shutter panels with minimum 12d smooth shank corrosion resistant box nails (minimum shank diameter of 0.128") spaced a maximum of 1" from each end of the shutter and a maximum of 6" on center along the length of the stiffener.
- **Design Pressure Ratings:** Table 1 summarizes the design pressure ratings, maximum panel spans, clip types, and maximum clip spacing. Refer to the Installation Instructions section of this report for complete installation instructions.

Table 1. Design Pressure Ratings and Installation Requirements

Maximum Panel Span ¹	Plylox™ Clip Type	Maximum Allowable Plylox™ Clip Spacing (Along vertical panel edges) ^{2, 3}	Design Pressure Rating (psf)
48"	Standard Clip (1.88" leg length)	6" from corners 12" on center	+34; -45
48"	Short Clip (1.63" leg length)	6" from corners 12" on center	+40; -52.8

Note:

- ¹ Panel span is the horizontal distance between vertical lines of Plylox™ clips.
- ² A minimum of two clips per vertical panel edge is required.
- ³ When panels are joined at the horizontal seams, a Plylox™ clip must be located close to the seam along both vertical edges.

Installation Instructions:

- **Shutter Panel Attachment:** Provide installation instructions.
 - Attach the wood structural panels to the exterior finish materials of the recessed opening using the Plylox™ clips according to the manufacturer's installation instructions and this product evaluation report.
 - The exterior finishes may be wood, stucco, or brick.
 - Cut the wood structural panels to fit within the recessed opening. Cut the panel dimensions a maximum of 1/4" less than the size of the rough opening to leave a 1/8" gap between the recessed wall opening and the shutter panel along all sides.
 - Pre-cut and label or mark the panels to identify the proper installation location on the building.
- **Allowable Shutter Span:** See Limitations Section.
- **Allowable Shutter Length:** See Limitations Section.
- **Plylox™ Clip Spacing:** See Table 1 in Limitations Section.
 - Apply the Plylox™ clips to the vertical edges of the panels. Space the clips a maximum of 6" from the panel corners and a maximum of 12" on center. If panels are joined together, then locate a Plylox™ clip within 2" from the horizontal seam.
 - You must place a minimum of two clips along each vertical panel edge.
 - Prior to installing the wood structural panel within the recessed opening, position the Plylox™ clips along the vertical edges of the panel.
 - With the Plylox™ clips in place, insert the wood structural panel into the recessed opening. Insert the panel within the recessed opening until the panel is seated firmly against the perimeter frame of the opening product.
- **Minimum Edge Distance:** The Plylox™ clips must have sufficient edge distance from the outer edge of the recessed opening to prevent breakout. There must be a minimum 3" recess from the outer edge of the wall to the outer edge of the exterior opening product that the shutter panels will bear against.

Installation Instructions (continued):

- **Brick Installations:** Provide corrosion resistant brick ties on the wall framing adjacent to the exterior opening. Space the brick ties a maximum of 16" on center vertically along the wall studs. For construction located Seaward of the Intracoastal Waterway or in an Exposure C condition, secure the brick ties to minimum Southern Yellow Pine wall framing with a fastener with a minimum length of 2-1/2" and a minimum smooth shank diameter of 0.113". For construction located in the Inland I zone and in an Exposure B condition, secure the brick ties to either minimum Spruce-Pine-Fir wall framing with a fastener with a minimum length of 3" and a minimum smooth shank diameter of 0.120" or minimum Southern Yellow Pine wall framing with a fastener with a minimum length of 2-1/2" and a minimum smooth shank diameter of 0.113".
- **Non-Rectangular Window Geometries:** Use the following installation instructions for non-rectangular window geometries. The Limitations section of this report specifies design pressure limitations.
- **Circular Windows:** The window diameter must not exceed 48". Space the Plylox™ clips a maximum of 12" on center along the circumference (perimeter) of the panels.
- **Arch top/Round top Windows:** The horizontal dimension of the window must not exceed 48". Place the Plylox™ clips in the same manner as for rectangular openings with the following additions: (1) Along each vertical edge, locate a clip at the point where the arch (curve) begins. (2) Locate a single Plylox™ clip at the apex of the arch (round top).
- **Half Moon Windows:** The horizontal dimension of the window must not exceed 48". Space the Plylox™ clips a maximum of 6" from each corner and a maximum 12" on center along the perimeter of the panels.

Note: The manufacturer's installation instructions must be available on the job site during installation. Use corrosion resistant fasteners as specified in the IRC, the IBC, and the Texas Revisions.