

Product Evaluation

RWA01 | 0621

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: RWA-01

Effective Date: June 1, 2021

Re-evaluation Date: June 2025

Product Name: Guardian 275® Translucent Daylighting Panels, Impact Resistant

Manufacturer: Major Industries, Inc.
7120 Stewart Avenue
Wausau, WI 54401
(715) 842-4616

General Description:

The Guardian 275® translucent daylighting panels may be flat or curved 2-3/4" or 4" thick translucent daylighting panels which feature a sandwich-type panel construction. The system consists of a perimeter aluminum frame with an aluminum grid core. The aluminum grid core is composed of extruded aluminum I-beams. The extruded aluminum I-beams are covered on both sides with two high performance flat fiberglass reinforced polymer (FRP) face sheets. The translucent daylighting panels may be thermally broken or non-thermally broken. The translucent daylighting panels are impact resistant.

Product Uses:

The Guardian 275® translucent daylighting panels may be used for canopies, walkways, skylights, roof coverings, windows, and as curtain walls.

Panel Construction:

Perimeter Frame: The perimeter frame of the panel is comprised of extruded aluminum I-beams. The I-beams have a double web and a 1" flange. The I-beams have a height of 2.49". Each I-beam corner is mitered and secured together with two internal corner clips.

Internal Grid: An internal grid is comprised of extruded aluminum I-beams. The I-beams have a single web and a 0.46" flange. The I-beams have a height of 2.49". Each I-beam has a notch at each end that allows for the continuous members to lock into place where each intersects the perimeter frame I-beams and allows for the intermediate members to lock into place where they intersect intermediate members. There are no mechanical connections for the internal grid I-beams. The maximum internal grid dimensions are 12" x 24". Smaller grid dimensions are available (8" x 20", 12" x 12", and 8" x 8").

Glazing Construction: The glazing material consists of a 0.070" STCWW Ultimate Series high impact translucent fiberglass sheet on the exterior surface (face to the weather) and a 0.045" FRCW standard fire rated translucent fiberglass sheet on interior surface. Both fiberglass sheets are bonded to opposite sides of the aluminum I-beams with a proprietary rubber-phenolic adhesive.

Frame Construction: The perimeter frame of the daylighting panel assembly is comprised of extruded aluminum members. The perimeter frame is secured to the building or supporting structure and is used to provide support for the translucent panels.

Mullion or Rafter Construction: Mullions are used for intermediate framing members. The mullions or rafters are comprised of extruded aluminum members. The mullions or rafters are used to provide support for the daylighting panels.

Product Identification: A label is affixed to the perimeter of the daylighting panels. The label includes the manufacturer's name and telephone number; the product name (Guardian 275®); and the name of the inspection agency (Intertek Testing Services).

Limitations:

Design Pressure Rating: +60 psf/-60 psf

Maximum Dimensions:

Maximum Allowable Panel Span: The maximum panel span of the assembly must not exceed 120".

Maximum Allowable Panel Width: The panel width must be considered either the smaller dimension for assemblies without intermediate supports (mullions or rafters) or the distance between intermediate supports (mullions or rafters). The maximum panel width must not exceed 60". NOTE: For assemblies supported with intermediate supports (mullions or rafters), the overall width of the assembly has no limitation; however, the panel span between intermediate supports (mullions or rafters) must not exceed 60".

Maximum Allowable Grid Dimensions: The largest grid size must not exceed 12" x 24". The maximum span (distance between supporting members) for the continuous I-beams that comprise the grid must not exceed 60". The maximum on center spacing of the continuous I-beams that comprise the grid must not exceed 24".

Impact Resistance: The daylighting panel assembly satisfies the TDI's criteria for protection from windborne debris. The assembly passed Missile Level D specified in ASTM E 1996-14a. The daylighting panel assembly may be installed at any height on the structure as long as the design pressure rating for the daylighting panel assembly is not exceeded. On essential facilities as defined in the IBC, the assemblies may only be installed at a height greater than 30 feet above the ground.

Acceptance of Smaller Assemblies: Assemblies with dimensions equal to or smaller than those specified above are acceptable within the limitations specified in this report.

Wall or Roof Bracing: The daylighting panels must not be used as lateral bracing for walls or as a diaphragm for a roof. A separate wall bracing system must be provided in the plane of the assembly to resist lateral loads.

Minimum Roof Slope: The daylighting panels must not be installed on roofs with a slope less than 2:12.

Installation:

General: The daylighting panel assembly must be installed in accordance with the manufacturer's installation instructions and detailed design drawings that have been prepared for the installation. Detailed design drawings and installation instructions are available from the manufacturer.

Design Drawings: The daylighting panel assembly is custom designed for each installation. A set of detailed design drawings, prepared by Major Industries, Inc., will be developed for each installation. The daylighting panel assembly must be installed as specified on the design drawings. The design drawings must be provided with the daylighting panel assembly. Each page of the design drawings must be signed and dated by a Texas licensed professional engineer. The following minimum information must be specified on the design drawings:

- The design pressure rating for the assembly: +60 psf / -60 psf;
- The design complies with the International Building Code (IBC) and the Texas Revisions to the IBC (Note: Indicate the Edition of the IBC currently adopted by the TDI);
- The design complies with ASTM E 1886-13a and ASTM E 1996-14a, Missile Level D;
- The design complies with ASTM E 283-04(2012), ASTM E 331-00(2009), and ASTM E 330-14;
- The species of lumber required for wood support framing;
- The minimum compressive strength for concrete or concrete masonry unit support framing; and
- The yield strength required for steel support framing.

- The deflection limitation used (NOTE: the deflection limitation must be as permitted by the IBC).

The design drawings must include the fully dimensioned daylighting panel assembly. The dimensions of the daylighting panel assembly must not exceed the allowable dimensions specified in the Limitations Section of this evaluation report. The design drawings must include details for the attachment of the perimeter frame to the support structure, the attachment of the intermediate supports (mullions or rafters) to the support structure, the construction of the grid core, the dimensions of the grid core, and the attachment of the grid core to the perimeter framing and intermediate framing. All details must be fully labeled and must include all components, material specifications, part numbers, and required fasteners. Fasteners required to secure the perimeter framing of the daylighting panel assembly to wood support framing and to other types of support framing are specified below.

Installation:

Frame Installation to Supporting Structure:

General: The structure support framing must be designed to support the loads from the daylighting panel assembly down to the foundation.

Wood Framing: The structure support framing must be minimum Spruce-Pine-Fir (SPF) dimension lumber. The perimeter frame of the assembly must be secured to the structure support framing with minimum No. 14 x 1-1/2" washer head HEX HD SS lag screws spaced approximately 12" on center along the perimeter of the framing. One 1-1/2" x 1-1/2" x 1/8" x 1-1/2" long aluminum angle (part P-1108) is utilized at each corner to facilitate squareness of the unit. The corner angle is friction fit to the support frame. The intermediate framing (mullions or rafters) is secured to the structure support framing at each end with two 4" x 3" x 1/8" x 1-1/8" wide aluminum angles (part P-1002), one on each side of the intermediate framing. The angles are secured to the intermediate framing with two 1/4"-20 x 5/8" SSMS with 1/4" sealing washers that extend through each angle and through the intermediate member. The angles are secured to the structure support framing with three No. 14 x 1-1/2" washer head HEX HD SS lag screws per angle. All interior framing joints are sealed with a construction grade silicone sealant. All screw penetrations into the structure support framing must be sealed with silicone sealant.

Pre-Cast Concrete, Cast-In-Place Concrete, Concrete Masonry Units, or Steel Framing: For the type of support framing used, the perimeter frame of the assembly must be secured to the support structure with fasteners that have a design capacity (shear, withdrawal, pull thru, etc.) equal to or greater than the design capacity of No. 14 x 1-1/2" washer head HEX HD SS lag screws into SPF dimension lumber. The fasteners must be spaced approximately 12" on center along the perimeter of the framing. One 1-1/2" x 1-1/2" x 1/8" x 1-1/2" long aluminum angle (part P-1108) is utilized at each corner to facilitate squareness of the unit. The corner angle is friction fit to the support frame. The intermediate framing (mullions or rafters) is secured to the structure support framing at each end with two 4" x 3" x 1/8" x 1-1/8" wide aluminum angles (part P-1002), one on each side of the intermediate framing. The angles are secured to the intermediate framing with

two 1/4"-20 x 5/8" SSMS with 1/4" sealing washers that extend through each angle and through the intermediate member. The angles are secured to the structure support framing with fasteners that have a design capacity (shear, withdrawal, pull thru, etc.) equal to or greater than No. 14 x 1-1/2" washer head HEX HD SS lag screws into SPF lumber. Three fasteners are required per angle. All interior framing joints are sealed with a construction grade silicone sealant. All screw penetrations into the structure support framing must be sealed with silicone sealant.

Panel Installation: EPDM gasket material is factory installed in an extruded groove of both the interior and the exterior sections of the perimeter frame of the daylighting panel assembly and in the interior and exterior sections of the mullions or rafters. Refer to the label applied on the perimeter of the panel to verify that the exterior face sheet is installed on the outside. Apply a layer of sealant to the back of U-shaped aluminum setting blocks (part P-1001) and attach them to the interior surface of the sill framing, locating them at the quarter points of the panel. Install exterior perimeter glazing caps by snapping into place. Install the intermediate framing (mullion) covers with 1/4"-20 x 1" HEX HD SS MS with 1/4" SS sealing washers 8" on center.

Note: Keep the manufacturer's installation instructions and the design drawings available on the job site during installation. Use corrosion resistant fasteners as specified in the IRC and the IBC.