

# ICC-ES Evaluation Report

**ESR-2136**

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**DIVISION: 07 00 00—THERMAL AND MOISTURE  
PROTECTION**
**Section: 07 21 00—Thermal Insulation**
**Section: 07 25 00—Water-Resistive Barriers/Weather  
Barriers**
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**EVALUATION SUBJECT:**
**GREENGUARD® FANFOLD AND INSULATIVE FOAM  
BOARDS AND ALSIDE PLATINUM SERIES™  
INSULATION**
**1.0 EVALUATION SCOPE**
**Compliance with the following codes:**

- 2009 *International Building Code*® (IBC)
- 2009 *International Residential Code*® (IRC)
- 2009 *International Energy Conservation Code*® (IECC)
- Other Codes (see Section 8.0)

**Properties evaluated:**

- Surface-burning characteristics
- Thermal resistance (R-value)
- Attic and crawl space installation
- Water-resistive barrier

**2.0 USES**

The GreenGuard® products recognized in this report, described in Table 1, are nonstructural foam plastic insulative boards used in interior applications, exterior walls and as components of nonclassified (nonrated) roof covering systems.

Additionally, the products are used as alternatives to the water-resistive barrier requirements of IBC Sections 1404.2 and 2510.6, and IRC Section R703, when installed on exterior walls as described in Section 4.4 of this report.

The Greenguard® insulation boards listed in Table 1 of this report are also sold under the Alside Platinum Series™ Insulation name.

**3.0 DESCRIPTION**
**3.1 General:**

The GreenGuard® insulations consist of an extruded polystyrene foam plastic core, with or without various combinations of facers, and are available in semirigid boards or “fanfolded” bundles. They range from 1/4 to

3/4 inch (6.4 to 19.1 mm) thick. Table 1 contains detailed product descriptions for the various GreenGuard® products recognized in this report. GreenGuard® products are available in 4-foot-wide (1.2 m) boards in lengths up to 50 feet (15.2 m).

**3.2 Joint-sealing Tapes:**

**3.2.1 General:** Joint-sealing tapes are used in conjunction with the insulation boards to seal joints between edges of the boards, when installation is as an alternative water-resistive barrier. The installation of the tape is described in Section 4.4.

**3.2.2 GreenGuard® Flashing Tape:** The tape is a polyester-faced self-adhering flashing tape with a butyl adhesive. The tape is nominally 0.020 inch thick (0.51 mm) and is produced in minimum 2-inch-wide (51 mm) rolls.

**3.2.3 GreenGuard® SuperStretch™ Tape:** The tape is an EPDM rubber-faced, self-adhering flashing tape with a butyl adhesive. The tape is nominally 0.052 inch thick (1.32 mm) and is produced in minimum 7-inch-wide (178 mm) rolls.

**3.2.4 GreenGuard® Contractor Sheathing/Housewrap Custom Tape:** The tape is a polypropylene-faced self-adhering flashing tape with an acrylic adhesive. The tape is nominally 0.002 inch thick (0.051 mm) and is produced in 2 1/2-inch-wide (64 mm) rolls.

**3.2.5 GreenGuard® Housewrap:** A polyolefin water-resistive barrier, as described in ICC-ES report [ESR-2906](#).

**3.2.6 Surface-burning Characteristics:** The extruded polystyrene core of the GreenGuard® products described in Table 1 has a flame-spread index of less than 25 and a smoke-developed index of less than 450 when tested in accordance with ASTM E 84 (UBC Standard 8-1) at a maximum thickness of 3/4 inch.

**3.2.7 Thermal Resistance (R-value):** Table 1 lists the R-values reported for each product.

**4.0 INSTALLATION**
**4.1 General:**

The GreenGuard® products recognized in this report must be installed in accordance with the manufacturer’s published installation instructions and this report. When used on exterior wall applications where the exterior and interior wall coverings are fastened through the insulation boards to structural supports, the maximum insulation board thickness is 3/4 inch (19.1 mm).

**4.2 Thermal Barrier:**

Except as noted in Section 4.3, The GreenGuard® products must be protected from the interior of the building by an approved 15-minute thermal barrier in accordance with IBC Section 2603.4 or IRC Section R316.4.

In cold storage room applications, both the interior surface and the room side surface of walls and ceilings must be covered with a thermal barrier complying with the applicable code. The length of the fasteners for the thermal barrier must be increased to accommodate the thickness of the insulation board.

#### 4.3 Attics and Crawl Spaces:

The GreenGuard® products, whether installed as an alternate water-resistive barrier or with a separate code-complying water-resistive barrier on the exterior face of the wall, may be installed on vertical (wall) surfaces in attics and crawl spaces with no covering applied to the interior side of the foam plastic, provided all of the following conditions are met:

- Entry to the attic or crawl space is only to service utilities, and no storage is permitted.
- There are no interconnected attic or crawl space areas.
- Air in the attic or crawl space is not circulated to other parts of the building.
- The total thickness of GreenGuard® does not exceed  $\frac{3}{4}$  inch (19.1 mm).
- Attic ventilation is provided when required by IBC Section 1203.2, or IRC Section R806, as applicable. Under-floor (crawl space) ventilation is provided when required by IBC Section 1203.3 or IRC Section R408.1, as applicable.
- Combustion air is provided in accordance with IMC Sections 701, as applicable.

#### 4.4 Water-resistive Barrier (New Construction Application):

**4.4.1 General:** The GreenGuard® products described in this report may be used as alternatives to the water-resistive barrier for exterior walls prescribed in the applicable code, when installed in accordance with one of the methods described in Section 4.4.2, 4.4.3 or 4.4.4. Windows are installed in accordance with the window manufacturer's installation instructions. Prior to installation of the exterior cladding, the insulation is inspected and any damaged insulation repaired using GreenGuard® Contractor Sheathing/Housewrap Custom Tape. During the installation of a window, GreenGuard® Flashing or GreenGuard® SuperStretch with a minimum width of 4 inches (102 mm) is installed in water-shedding fashion (shingle fashion) in accordance with the Pactiv GreenGuard® Flashing Installation Guide.

**4.4.2 GreenGuard® PLYGOOD Ultra and GreenGuard®:** The insulation board is aligned with the bottom edge of the wall, with the length dimension running vertically. The vertical joints must occur over framing members or are backed. Horizontal seams or joints may be unbacked. The framing members must be spaced a maximum of 16 inches (406 mm) on center. The insulation is attached using 1 $\frac{1}{2}$ -inch-long (38 mm) ring shank nails with 1-inch-diameter (25.4 mm) plastic caps, spaced 16 inches (406 mm) on center around the perimeter and at all vertical framing members. At pipe or other small penetrations, gaps are sealed using a silicone sealant complying with ASTM C 920, Type S, Grade NS, Class 25, or an expanding spray foam sealant complying with AAMA 812. All horizontal and vertical insulation board seams are sealed with GreenGuard® Contractor Sheathing/Housewrap Custom Tape.

**4.4.3 GreenGuard® Fanfold Siding Underlayments Installed Using Flanged Windows:** Several feet of the GreenGuard® Fanfold bundle are unfolded and aligned with the bottom edge of the wall sheathing, with the length

dimension running horizontally. The GreenGuard® fanfold is attached using common roofing nails spaced 24 inches (610 mm) on center around the perimeter and at all vertical framing members. At pipe or other small penetrations, gaps are sealed using a silicone sealant or an expanding spray foam sealant. All horizontal and vertical insulation board seams are sealed using GreenGuard® Contractor Sheathing/Housewrap Custom Tape or GreenGuard® Flashing Tape, or by using strips of 16-inch-wide (406 mm) GreenGuard® Housewrap and GreenGuard® Flashing Tape to create a z-furring joint treatment in accordance with the manufacturer's published installation instructions.

**4.4.4 GreenGuard® Fanfold Siding Underlayments Installed Using Nonflanged Windows:** Several feet of the GreenGuard® Fanfold bundle are unfolded and aligned with the bottom edge of the wall sheathing, with the length dimension running horizontally. The GreenGuard® fanfold is attached using common roofing nails spaced 24 inches (610 mm) on center around the perimeter and at all vertical framing members. Framing members must be spaced a maximum of 16 inches (406 mm) on center. At pipe or other small penetrations, gaps are sealed using a silicone sealant complying with ASTM C 920, Type S, Grade NS, Class 25, or an expanding spray foam sealant complying with AAMA 812. All horizontal and vertical insulation board seams are sealed using GreenGuard® Contractor Sheathing/Housewrap Custom Tape or GreenGuard® Flashing Tape, or by using strips of 16-inch-wide (406 mm) GreenGuard® Housewrap and GreenGuard® Flashing Tape to create a z-furring joint treatment. Aluminum brickmold caps are formed for windows. Sill, jamb and head sections are formed with a minimum 2-inch-wide (51 mm) flange. All brickmold sections are installed in water-shedding fashion (shingle-fashion) and all joints are sealed with silicone sealant complying with ASTM C 920, Type S, Grade NS, Class 25. GreenGuard® Flashing or GreenGuard® SuperStretch is installed with a minimum 4-inch (102 mm) width in water-shedding fashion (shingle fashion) so that it overlaps the brickmold sections. Windows are installed in accordance with the window manufacturer's installation instructions. Prior to installation of the exterior cladding, the insulation is inspected and any damaged insulation is repaired using GreenGuard® Contractor Sheathing/Housewrap Custom Tape.

#### 5.0 CONDITIONS OF USE

The Pactiv GreenGuard® and Alside Platinum Series™ insulation products described in this report comply with, or are suitable alternatives to what is specified in, those codes listed in Section 1.0 of this report, subject to the following conditions:

- The insulation products must be installed in accordance with the manufacturer's published installation instructions, subject to the conditions of this report and the applicable code. In the event of a conflict, this report governs.
- The insulation boards, when installed on the exterior face of exterior walls, must be covered with an approved exterior wall cladding that is structurally adequate to resist the prescribed wind pressures set forth in the applicable code. Where the boards are not installed as an alternative water-resistive barrier as described in Section 4.4 of this report, the boards must be covered by a water-resistive barrier complying with the requirements of the applicable code.
- Use of the insulation boards to structurally resist transverse, racking-shear or vertical loadings is outside the scope of this report. The walls must be braced in accordance with the requirements of the applicable code.

- 5.4 The insulation boards must not be used as a nailing base for exterior siding materials. All nailing must be made into the wall framing as required by the siding manufacturer’s instructions or the applicable code.
- 5.5 In areas where the probability of termite infestation is “very heavy” and the insulation boards are installed on buildings containing wood frame construction, the installation must meet the requirements of IBC Section 2603.8 or IRC Section R318.4, as applicable.
- 5.6 The insulation boards must be separated from the interior of the building by an approved thermal barrier of 1/2-inch-thick (12.7 mm) gypsum wallboard or equivalent 15-minute thermal barrier in accordance with the applicable code, except when installed in attics and crawl spaces in accordance with Section 4.3 of this report.
- 5.7 The use of insulation boards in roof covering systems is limited to use where nonclassified (non-rated) roof covering systems are permitted by the applicable code and where the insulation is separated from the interior of the building by an approved 15-minute thermal barrier.
- 5.8 When use is in the construction of walls, a vapor retarder must be installed in accordance with IBC Section 1405.3 or IRC Section R601.3.
- 5.9 The GreenGuard® insulation boards are manufactured at the Pactiv plants located in Winchester, Virginia, and Chippewa Falls, Wisconsin, under a quality control program with inspections provided by Underwriters Laboratories Inc. (AA-668).

**6.0 EVIDENCE SUBMITTED**

- 6.1 Data in accordance with the ICC-ES Acceptance Criteria for Foam Plastic Insulation (AC12), dated June 2009.
- 6.2 Data in accordance with the ICC-ES Acceptance Criteria for Foam Plastic Panels Used as Weather-resistant Barriers (AC71), dated February 2003 (editorially revised June 2008).
- 6.3 Reports of room corner testing in accordance with UBC Standard 26-3 for use in attic and crawl space applications.

**7.0 IDENTIFICATION**

Each GreenGuard® or Alside Platinum Series™ product, or the product packaging must bear the Pactiv Building Products name and address, the product name, the flame-spread and smoke-developed indices, the R-value, the name of the inspection agency (Underwriters Laboratories Inc.) and the evaluation report number (ESR-2136). Additionally, joint sheathing tape must bear the Pactiv Building Products name, the product name and the evaluation report number (ESR-2136).

**8.0 OTHER CODES**

- 8.1 In addition to the codes referenced in Section 1.0, the products described in this report were evaluated for compliance with the requirements of the following codes:
  - 2006 *International Building Code*® (2006 IBC)
  - 2006 *International Residential Code*® (2006 IRC)
  - 2006 *International Energy Conservation Code*® (2006 IECC)

The products comply with the above-mentioned codes as described in Section 2.0 through 7.0 of this report, except as noted below:

- **Installation:** See Section 4.2, except the interior of the building must be separated from the insulation boards with a thermal barrier complying with Section R314.4 of the 2006 IRC.
- **Special Uses—Attics and Crawl Spaces:** See Section 4.3, except combustion air is provided in accordance with Section 701 and 703 of the 2006 *International Mechanical Code*®.
- **Conditions of Use:** See Section 5.0, except use of the insulation boards in areas of “very heavy” termite infestation must be in accordance with 2006 IRC Section R320.5. Also see Section 5.8, except a vapor retarder must be installed in accordance with Sections R318.1 and N1102.5 of the 2006 IRC and Sections 402.5 and 502.5 of the 2006 IECC.

**TABLE 1—PRODUCT TYPES**

PRODUCT NAME	THICKNESS (in.)	DENSITY (pcf)	R-VALUE	PRODUCT DESCRIPTION
GreenGuard N14	1/4	3.3	1.0	Perforated extruded polystyrene foam.
GreenGuard S14	1/4	3.3	1.0	Extruded polystyrene foam core with a clear, perforated, flexible plastic facer on one side.
GreenGuard NP14	1/4	3.3	1.0	Multilayered, perforated extruded polystyrene foam.
GreenGuard P14	1/4	3.3	1.0	Extruded polystyrene foam core with clear, perforated plastic facers on both sides.
GreenGuard XP14	1/4	3.3	1.0	Extruded polystyrene foam core with clear, perforated, flexible plastic facers on both sides and a “cut & fold” hinge design.
GreenGuard PLYFOLD Y250	1/4	3.3	1.0	Extruded polystyrene foam core with clear, perforated plastic facers on both sides.
GreenGuard FP14	1/4	3.7	1.0	Extruded polystyrene foam core with clear, perforated plastic facers on both sides with an additional perforated, metallized facer on one side.
GreenGuard XFP14	1/4	3.7	1.0	Extruded polystyrene foam core with clear, perforated, flexible plastic facers on both sides with an additional perforated, metallized facer on one side. Product has a “cut & fold” hinge design.
GreenGuard BACKER-PRO	1/4	4.7	1.0	Extruded polystyrene foam that is contoured.
GreenGuard DC14	1/4	4.7	1.0	Extruded polystyrene foam that is contoured.
GreenGuard PB4	1/4	3.7	1.0	Extruded polystyrene foam core with clear, nonperforated plastic facers on both sides.

TABLE 1—PRODUCT TYPES (Continued)

GreenGuard PLYGOOD PG28	$\frac{1}{4}$	3.7	1.0	Extruded polystyrene foam core with clear, nonperforated plastic facers on both sides.
GreenGuard PLYGOOD PGF28	$\frac{1}{4}$	4.2	1.0	Extruded polystyrene foam core with clear, nonperforated plastic facers on both sides with an additional nonperforated metallized facer on one side.
GreenGuard CB4	$\frac{1}{4}$	3.7	1.0	Extruded polystyrene foam core with clear, nonperforated plastic facers on both sides with an additional white, nonperforated facer on the nonprinted side.
GreenGuard PLYGOOD NPG3075, NPG308	$\frac{5}{16}$	2.6	1.0	Multilayered, nonperforated extruded polystyrene foam.
GreenGuard PLYGOOD PG3075, PG308	$\frac{5}{16}$	3.6	1.0	Extruded polystyrene foam core with clear, nonperforated plastic facers on both sides.
GreenGuard PGWZ WZPG3075, WZPG308	$\frac{5}{16}$	3.6	1.0	Extruded polystyrene foam core with a clear, nonperforated plastic facer on one side and a reinforcing scrim on the printed side.
GreenGuard NP38	$\frac{3}{8}$	2.6	1.5	Multilayered, perforated extruded polystyrene foam.
GreenGuard NPG38	$\frac{3}{8}$	2.6	1.5	Multilayered, perforated extruded polystyrene foam.
GreenGuard P38	$\frac{3}{8}$	3.2	1.5	Extruded polystyrene foam core with clear, perforated, flexible plastic facers on both sides. Product has a “cut & fold” hinge design.
GreenGuard XP38	$\frac{3}{8}$	3.2	1.5	Extruded polystyrene foam core with clear, perforated, flexible plastic facers on both sides, printed with grid lines. Product has a “cut & fold” hinge design.
GreenGaurd Y375	$\frac{3}{8}$	3.2	1.5	Extruded polystyrene foam core with clear, perforated, flexible plastic facers on both sides. Product has a “cut & fold” hinge design.
GreenGuard FP38	$\frac{3}{8}$	3.4	1.5	Extruded polystyrene foam core with clear, perforated, flexible plastic facers on both sides with an additional perforated, metallized facer on one side. Product has a “cut & fold” hinge design.
GreenGuard XFP38	$\frac{3}{8}$	3.4	1.5	Extruded polystyrene foam core with clear, perforated, flexible plastic facers on both sides with an additional perforated, metallized facer on one side (nonreflective side is printed with grid lines. Product has a “cut & fold” hinge design.
GreenGuard PB6	$\frac{3}{8}$	3.6	1.5	Extruded polystyrene foam core with clear, nonperforated, flexible plastic facers on both sides. Product has a “cut & fold” hinge design.
GreenGuard PB6W	$\frac{3}{8}$	3.6	1.5	Extruded polystyrene foam core with clear, nonperforated, flexible plastic facers on both sides with an additional white, nonperforated facer on one side. Product has a “cut & fold” hinge design.
GreenGuard PB6 PLUS	$\frac{3}{8}$	3.6	1.5	Extruded polystyrene foam core with clear, nonperforated, flexible plastic facers on both sides with an additional clear, nonperforated facer on both sides. Product has a “cut & fold” hinge design.
GreenGuard PB6FA	$\frac{3}{8}$	3.6	1.5	Extruded polystyrene foam core with clear, nonperforated, flexible plastic facers on both sides with an additional white, nonperforated facer on one side. Product has a “creased” hinge design.
GreenGuard PB6FA 90/180	$\frac{3}{8}$	3.6	1.5	Extruded polystyrene foam core with clear, nonperforated, flexible plastic facers on both sides with an additional white, polyolefin scrim facer on one or both sides.
GreenGuard PLYGOOD PGF38	$\frac{3}{8}$	3.5	1.5	Extruded polystyrene foam core with clear, nonperforated, flexible plastic facers on both sides with an additional nonperforated, metallized facer on one side.
GreenGuard PLYGOOD Ultra PGU38, PGU39	$\frac{3}{8}$	3.6	1.5	Extruded polystyrene foam core with a clear, nonperforated plastic facer on one side and a reinforcing scrim on the printed side.
GreenGuard PLYGOOD Ultra PGU48, PGU49	$\frac{7}{16}$	3.2	1.8	Extruded polystyrene foam core with a clear, nonperforated plastic facer on one side and a reinforcing scrim on the printed side.
GreenGuard CM	$\frac{1}{2} - \frac{3}{4}$	2.0	3.0 - 3.8	Extruded polystyrene insulation board.
GreenGuard SL	$\frac{1}{2} - \frac{3}{4}$	2.0	3.0 - 3.8	Extruded polystyrene insulation board with shiplap edges.
GreenGuard CMX	$\frac{1}{2} - \frac{3}{4}$	2.0	3.0 - 3.8	Extruded polystyrene insulation board with a clear plastic facer on both side.
GreenGuard SLX	$\frac{1}{2} - \frac{3}{4}$	2.0	3.0 - 3.8	Extruded polystyrene insulation board with a clear plastic facer on both sides, and shiplap edges.

For **SI**: 1 inch = 25.4 mm, 1 pcf = 16.02 kg/m<sup>3</sup>, R-value: 1°F·ft<sup>2</sup>·hr/Btu = 0.176 m<sup>2</sup>·K/W.

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