

ICC-ES Evaluation Report

ESR-1587

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DIVISION: 07 00 00—THERMAL AND MOISTURE PROTECTION

Section: 07 21 00—Thermal Insulation

DIVISION: 31 00 00—EARTHWORK

Section: 31 31 16—Termite Control

REPORT HOLDER:

PLASTI-FAB LTD.

EVALUATION SUBJECT:

PLASTISPAN, PLASTISPAN TB AND ENERSPAN EXPANDED POLYSTYRENE (EPS) INSULATION BOARDS AND GEOSPEC EPS GEOFOAM BLOCKS

1.0 EVALUATION SCOPE

Compliance with the following codes:

- 2018, 2015, 2012 and 2009 *International Building Code*® (IBC)
- 2018, 2015, 2012 and 2009 *International Residential Code*® (IRC)
- 2018, 2015, 2012 and 2009 *International Energy Conservation Code*® (IECC)

Properties evaluated:

PlastiSpan, PlastiSpan TB and EnerSpan EPS insulation boards

- Surface-burning characteristics
- Physical properties
- Thermal resistance (*R*-values)
- Attics and crawl spaces
- Termite resistance

GeoSpec EPS geofoam blocks

- Surface-burning characteristics
- Physical properties/compressive resistance

2.0 USES

2.1 PlastiSpan, PlastiSpan TB and EnerSpan Boards:

PlastiSpan, PlastiSpan TB and EnerSpan EPS insulation are expanded polystyrene foam plastic boards for use as nonstructural thermal insulation sheathing in wall cavities, ceiling assemblies and roof covering assemblies, or on the outside faces of exterior walls of Type V-B (IBC) construction or structures constructed in accordance with the IRC. PlastiSpan, PlastiSpan TB and EnerSpan EPS

insulation boards may also be used on walls in attics and crawl spaces without the ignition barrier required by the applicable code, when installation is as noted in Section 4.2 of this report. PlastiSpan, PlastiSpan TB and EnerSpan (EPS) insulation boards may also be used as the core of structural insulated panels (SIPs) when specifically recognized in an ICC-ES evaluation report for the SIP showing compliance with the ICC-ES Acceptance Criteria for Sandwich Panels (AC04).

2.2 PlastiSpan EPS insulation boards treated with Lanxess Preventol TM-EPS Preservative Insecticide and PlastiSpan TB EPS insulation boards:

PlastiSpan EPS insulation boards factory-treated with Lanxess Preventol TM-EPS Preservative Insecticide and PlastiSpan TB EPS insulation boards used as nonstructural insulation are for installation below grade in areas subject to termites in accordance with Section 4.6 of this report.

2.3 GeoSpec EPS Geofoam Blocks:

GeoSpec EPS Geofoam blocks are used as lightweight structural fill in floor cavities when installation is in accordance with Section 4.4 of this report.

3.0 DESCRIPTION

PlastiSpan, PlastiSpan TB and EnerSpan EPS insulation boards are Type I, II, VIII or IX boards, complying with ASTM C578, and have minimum densities of 0.90 pcf (14.4 kg/m³), 1.35 pcf (22.6 kg/m³), 1.15 pcf (18.4 kg/m³) or 1.8 pcf (28.8 kg/m³), respectively. The EPS insulation boards have a flame-spread index not exceeding 25 and a smoke-developed index not exceeding 450 when tested at a thickness of 6 inches (152 mm) in accordance with ASTM E84. See Table 1 for manufacturing locations.

PlastiSpan, PlastiSpan TB and EnerSpan EPS Insulation boards are available with flat faces and square edges in various lengths and widths and in thicknesses up to 6 inches (150 mm). PlastiSpan, PlastiSpan TB and EnerSpan EPS insulation boards have the minimum density and maximum thickness and thermal resistance (*R*-values) specified in Table 1.

GeoSpec EPS15, EPS19, EPS22, EPS29, EPS39 and EPS46 geofoam blocks have minimum densities of 0.90, 1.15, 1.35, 1.80, 2.40 and 2.85 pcf (14.4, 18.4, 21.6, 28.8, 38.4 and 45.7 kg/m³), and comply with ASTM D6817 Type EPS15, EPS19, EPS 22, EPS29, EPS39 and EPS46, respectively. The geofoam blocks have a flame-spread index not exceeding 25 and a smoke-developed index not exceeding 450 when tested at a thickness of 6 inches (152 mm) in accordance with ASTM E84. See Table 3 for the GeoSpec geofoam block manufacturing locations, minimum densities and compressive resistances.

4.0 INSTALLATION

4.1 General:

Except as noted in Sections 4.2 and 4.4 of this report, the interior of the building must be separated from the insulation boards with an approved thermal barrier as required in IBC Section 2603.4 or IRC Section R316.4, as applicable. If required, a vapor retarder must be installed in accordance with IBC Section 1405.3, 2015 and 2012 IBC Section 1405.3, 2018, 2015 and 2012 IRC Sections R702.7 and N1102.2.10 or 2009 IRC Section R601.3 or N1102.2.9, as applicable. Protection against condensation in exterior wall assemblies must be provided in accordance with IBC Section 1403.2 or IRC Section R703. The insulation boards must not be used as a nailing base for exterior finish materials. Fasteners used to attach exterior finish material over insulation boards must comply with a current ICC-ES evaluation report for proprietary wall covering materials, IBC Section 1404 or Section 1405, IRC Table R703.4, and the finish manufacturer's installation instructions. For cementitious exterior wall coating applications, fasteners for insulation boards thicker than 1½ inches (38 mm) must be considered for lateral resistance to ensure support for the exterior wall coatings. The attachment of finish materials over the insulation board must allow for a minimum 1-inch (25.4 mm) penetration of the fasteners into wood framing. Sheathing or a wall covering over the insulation must be structurally adequate to resist horizontal forces perpendicular to the wall. The insulation boards must not be used as exterior stud wall bracing. All walls must be braced in accordance with 2018 and 2015 IBC Section 2308.6, 2012 IBC Sections 2308.9.3 and 2308.12.4, or IRC Section R602.10, as applicable.

Insulation boards for use as roof insulation must be installed as specified in a current ICC-ES evaluation report for the roof covering system.

4.2 Special Uses: Attics and Crawl Spaces

PlastiSpan, PlastiSpan TB and EnerSpan EPS insulation boards can be used on walls in attics and crawl spaces with no covering applied to the attic or crawl space 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.
- Attic ventilation is provided when required by 2018 IBC Section 1202.2, 2015, 2012 and 2009 IBC Section 1203.2 or IRC Section R806, as applicable. Under-floor (crawl space) ventilation is provided when required by 2018 IBC Section 1202.4, 2015 IBC Section 1203.4, 2012 and 2009 IBC Section 1203.3 or IRC Section R408.1, as applicable.
- Boards are produced from BASF Neopor, Styropek, NOVA, Styrochem or Plasti-Fab EPR beads; having a nominal density of 1 pcf (16 kg/m³) and a maximum thickness of 4 inches (102 mm); or a nominal density of 2 pcf (32 kg/m³) and a maximum thickness of 2 inches (51 mm).
- Combustion air is provided in accordance with Section 701 of the *International Mechanical Code*®.

4.3 Termite Resistance:

PlastiSpan EPS insulation boards treated with Lanxess Preventol TM-EPS Preservative Insecticide are for installation in areas subject to termites as noted in Table 2.

PlastiSpan TB EPS insulation boards treated with insecticide are for installation in areas subject to termites.

4.4 GeoSpec EPS geofoam blocks:

GeoSpec EPS geofoam blocks must be in accordance with the manufacturer's installation instructions and as noted in Section 5.7. The insulation blocks must not be used structurally to resist loads except as provided for in Sections 5.7.2 and 5.7.3.

The interior of the building must be separated from the geofoam blocks with a thermal barrier as required by IBC Section 2603.4, except when installation is in accordance with Section 5.7.1.

5.0 CONDITIONS OF USE

The PlastiSpan, PlastiSpan TB and EnerSpan EPS insulation boards and GeoSpec EPS geofoam blocks described in this report comply with, or are acceptable alternatives to what is specified in, those codes listed in Section 1.0 of this report, subject to the following conditions:

- Installation must comply with this report, the report holder's published installation instructions and the applicable code. In the event of a conflict between this report and the report holder's published installation instructions, this report governs.
- The insulation board must be covered with an approved exterior wall covering, including a water-resistive barrier complying with 2018 IBC Section 1402.4, 2015, 2012 and 2009 IBC Section 1404.2 or IRC Section R703.2, as applicable.
- The exterior wall covering spanning between wall framing members must provide the necessary structural resistance to wind and seismic forces.
- Insulation boards must not be used as a nailing base for exterior siding materials. All nailing must be made through the insulation into the wall framing or structural sheathing as required by the siding manufacturer's instructions or the applicable code.
- Except as noted in Sections 4.2 or 4.4 of this report, the insulation boards must be separated from the interior of the building with a thermal barrier complying with IBC Section 2603.4 or IRC Section R316.4, as applicable.
- For structures required to comply with the IBC or IRC, use of the foam plastic insulation in areas where the probability of termite infestation is "very heavy" must be in accordance with 2018 and 2015 IBC Section 2603.8, 2012 IBC Section 2603.9, 2009 IBC Section 2603.8 or IRC Sections R316.7 and R318.4, respectively, except as permitted for PlastiSpan EPS insulation boards factory-treated with Lanxess Preventol TM-EPS Preservative Insecticide and PlastiSpan TB EPS insulation boards in Section 4.3.
- When GeoSpec EPS geofoam blocks are installed, the following conditions of use apply:

5.7.1 The geofoam blocks must be separated from the building interior with a minimum 1-inch-thick (25.4 mm) layer of concrete or masonry on all faces as required by IBC Section 2603.4.1.1, except in buildings of Type V construction where separation may be by a minimum nominally ½-inch-thick wood structural panel when installation is in accordance with IBC Section 2603.4.1.14. Where the thermal barrier consists of a minimum 1-inch-thick (25.4 mm)

layer of concrete or masonry, the thickness of the geofoam blocks in the floor assembly may exceed 4 inches (102 mm). The design of the concrete or masonry covering is outside the scope of this report and must comply with all applicable code requirements for the occupancy and type of construction for the specific project.

5.7.2 The design loads to be resisted by the geofoam blocks must be determined in accordance with the IBC. The compressive resistance of the geofoam blocks at 1 percent strain is listed in Table 3 as determined in accordance with ASTM D6817. The use of the geofoam blocks is limited to floor applications where the uniform and localized loading does not exceed the compressive resistance of the geofoam blocks at 1 percent strain.

5.7.3 Design calculations and details for the specific applications, verifying compliance with this report and applicable codes, must be furnished to the code official. The documents must be prepared by a registered design professional where required by the statutes of the jurisdiction in which the project is to be constructed.

5.7.4 Use of the geofoam blocks is limited to applications where the geofoam will not be subject to direct exposure to hydrocarbons.

5.7.5 Penetrations through the thermal barrier described in Section 5.7.1 must be subject to approval by the code official. When the geofoam blocks are used in a fire-resistance-rated floor assembly, penetrations through the assembly must be protected in accordance with 2018 IBC Section 714.5 or 2015 and 2012 IBC Section 714.4. If used, through-penetration firestop systems must be tested in accordance with ASTM E814 or UL 1479, as required by 2018 IBC Section 714.5.1.2, 2015 IBC Section 714.4.1.2 or 2012 IBC Section 714.4.1.1.2.

5.8 Jobsite certification and labeling must comply with 2012 IECC Sections C303.1.1 and R303.1.1 (2009 IECC Section 303.1.1).

5.9 The foam plastic boards and geofoam blocks are produced under a quality control program with inspections by ICC-ES, at Crossfield, Alberta, Canada; Saskatoon, Saskatchewan, Canada; Winnipeg, Manitoba, Canada; Ajax, Ontario, Canada; Delta, British Columbia, Canada; Kitchener, Ontario, Canada; Lebanon, Ohio; and Lester Prairie, Minnesota.

6.0 EVIDENCE SUBMITTED

6.1 Data in accordance with the ICC-ES Acceptance Criteria for Foam Plastic Insulation (AC12), dated June 2015 (editorially revised October 2017).

6.2 Data in accordance with the ICC-ES Acceptance Criteria for Termite-resistant Foam Plastics (AC239), dated October 2008 (editorially revised February 2018).

6.3 Reports of tests in accordance with NFPA 286.

6.4 Data in accordance with the ICC-ES Acceptance Criteria for Rigid Cellular Polystyrene (RCPS) Geofoam Used in Interior Floor Applications (AC452), dated October 2013 (editorially revised February 2018).

7.0 IDENTIFICATION

7.1 The insulation boards are packaged in bundles bearing a label with the Plasti-Fab Ltd. name; the manufacturing facility location; the date of manufacture; the density; the flame-spread index; the smoke-developed index; and the thermal resistance (R-value); and the evaluation report number (ESR-1587).

Additionally, the labels for insulation boards used for attic and crawl space installations, in accordance with Section 4.2 of this report, must be identified as being produced from "NOVA," "BASF Neopor," "Styropek," "StyroChem" or "Plasti-Fab EPR" beads.

PlastiSpan EPS boards treated with Preventol TM-EPS Preservative Insecticide are labeled as shown in Figures 1 through 3.

PlastiSpan TB EPS boards treated with insecticide are labeled as shown in Figure 4.

7.2 GeoSpec EPS geofoam blocks bear a label with the Plasti-Fab Ltd. name; manufacturing facility location; date of manufacture; ASTM D6817 type or product name; flame-spread index; smoke-developed index; compressive resistance; and the evaluation report number (ESR-1587).

7.3 The report holder's contact information is the following:

PLASTI-FAB LTD.
300, 2891 SUNRIDGE WAY NE
CALGARY, ALBERTA T1Y 7K7
CANADA
(403) 248-9306
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TABLE 1—PLASTISPAN, PLASTISPAN TB AND ENERSPAN EPS INSULATION BOARD PROPERTIES AND MANUFACTURING LOCATIONS

MANUFACTURING LOCATION	ASTM C578 TYPE	MINIMUM DENSITY (pcf)	MAXIMUM THICKNESS (inches)	R-VALUE PER INCH OF THICKNESS
Delta, British Columbia, Canada, Kitchener, Ontario, Canada, Crossfield, Alberta, Canada, Saskatoon, Saskatchewan, Canada, Winnipeg, Manitoba, Canada, Ajax, Ontario, Canada, Lebanon, Ohio, Lester Prairie, MN	I	0.90	6	3.6
	II	1.35	6	4.0
	VIII	1.15	6	3.8
	IX	1.80	6	4.2

For SI: 1 inch = 25.4 mm, 1 pcf = 16.02 kg/m³, 1°F·ft²·h/Btu = 0.176 m²·K/W, 1°F = 1.8°C+32.

TABLE 2—MINIMUM DOSAGE LEVELS OF PREVENTOL® TM BY END USE

END USE	MINIMUM ¹
EPS Foam Used Above Ground Contact Low Hazard “None to Moderate” Termite Zones Per IRC Figure R301.2(6), IBC Figure 2603.8	100 ppm
EPS Foam Used Above Ground Contact Medium Hazard “Heavy to Very Heavy” Termite Zones Per IRC Figure R301.2(6), IBC Figure 2603.8 Formosan Termites	200 ppm
EPS Foam Used in Ground Contact/Below Ground Contact High Hazard “None to Very Heavy” Termite Zones Per IRC Figure R301.2(6), IBC Figure 2603.8 Formosan Termites	500 ppm

¹The minimum dosage rate is expressed as ppm (parts per million) and is based on the final volume of molded EPS.

TABLE 3—GEOSPEC EPS GEOFOAM BLOCK COMPRESSIVE RESISTANCE VALUES^{1,2}

PRODUCT	ASTM D6817 TYPE	MINIMUM DENSITY (pcf)	COMPRESSIVE RESISTANCE AT 1% STRAIN (psi)
GeoSpec EPS15	Type EPS15	0.90	3.6
GeoSpec EPS19	Type EPS19	1.15	5.8
GeoSpec EPS22	Type EPS22	1.35	7.3
GeoSpec EPS29	Type EPS29	1.80	10.9
GeoSpec EPS39	Type EPS39	2.40	15.0
GeoSpec EPS46	Type EPS46	2.85	18.6

For SI: 1 pcf = 16.02 kg/m³, 1 psi = 6.894757 kPa.

¹The values listed are the minimum required by ASTM D6817.

²Manufacturing locations include Delta, British Columbia, Canada, Kitchener, Ontario, Canada, Crossfield, Alberta, Canada, Saskatoon, Saskatchewan, Canada, Winnipeg, Manitoba, Canada, Ajax, Ontario, Canada, Lebanon, Ohio, Lester Prairie, MN

	PREVENTOL® TM-EPS
ABOVE GROUND USE	Low Hazard Use
Termite Resistant EPS	Above Ground Contact
2009-2010	“None to Moderate” Termite Zone
PFB Manufacturing, LLC	IRC Fig. R301.2(6), IBC Fig. 2603.8
Lebanon, Ohio	ICC-ES ESR-1587
	100 ppm (w/v)
	Plasti-Fab Ltd.
	MONITORED BY:
	Intertek Testing Services
	AA-690

FIGURE 1—PREVENTOL® TM-EPS LOW HAZARD USE MARKING



FIGURE 2—PREVENTOL® TM-EPS MEDIUM HAZARD USE MARKING

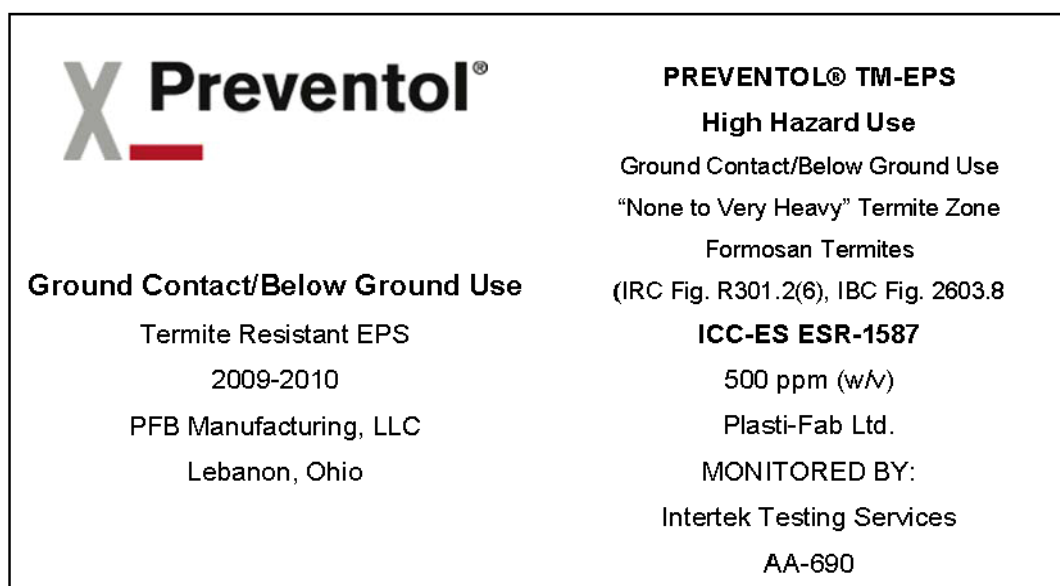


FIGURE 3—PREVENTOL® TM-EPS HIGH HAZARD USE MARKING

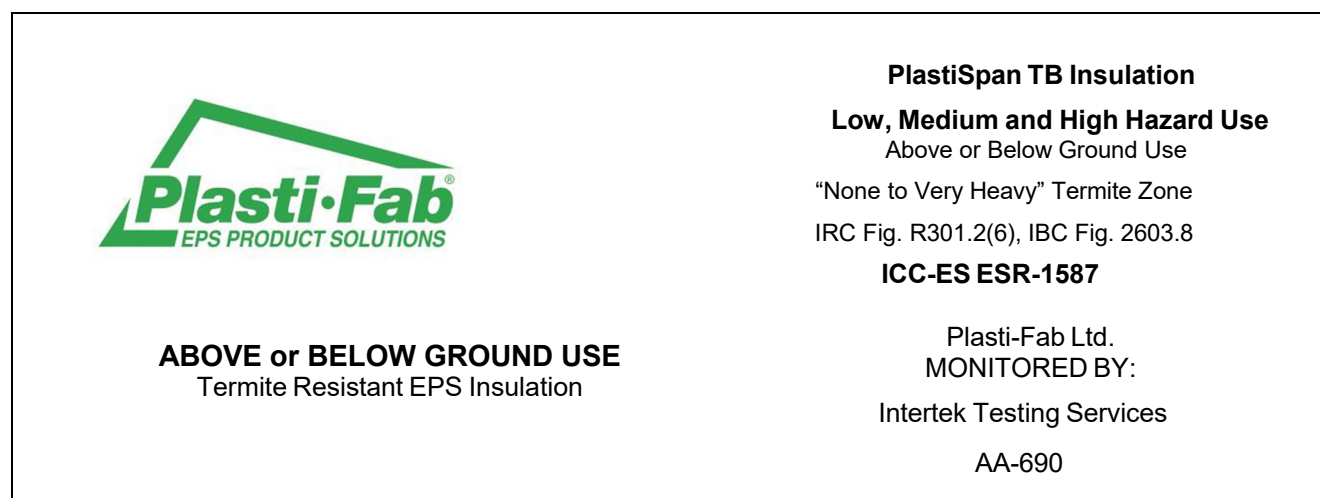


FIGURE 4—PLASTISPAN TB INSULATION FOR LOW, MEDIUM AND HIGH HAZARD USE MARKING