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# Code Compliance Research Report CCRR-1033

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## DIVISION: 07 00 00 – THERMAL AND MOISTURE PROTECTION

### Section: 07 21 00 – Thermal Insulation

#### REPORT HOLDER:

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#### REPORT SUBJECT:

EnerSpan® Insulation

### 1.0 SCOPE OF EVALUATION

This Research Report addresses compliance with the following Codes:

- 2015, 2012, and 2009 *International Code Building®* (IBC)
- 2015, 2012, and 2009 *International Residential Code®* (IRC)
- 2015 and 2010 *National Building Code of Canada* (NBC) – See Section 8.1
- 2012 *International Green Construction Code®* (IgCC) – See Section 8.2

EnerSpan® Insulation has been evaluated for the following properties:

- Physical properties
- Surface-burning characteristics
- Thermal resistance
- Attic and crawl space installation
- Exterior walls in Types I – IV construction
- Use in Type V construction

See Table 1 for applicable Code sections related to these properties.

NOTE: This report references 2015 Code sections with [2012 and 2009] Code sections shown in brackets where they differ. This report references 2015 NBC sections with [2010] NBC code sections in brackets where they differ.

### 2.0 USES

EnerSpan Insulation is used for non-structural thermal insulation in wall assemblies, ceiling or floor assemblies, and door cavities. The foam boards may also be used in attic and crawl spaces without a code-prescribed ignition barrier when installed as per Section 4.2.

The insulation boards may be used as a sandwich panel core where EPS insulation complying with ASTM C578 or CAN/ULC S701 is specified in the Code Evaluation Report for the sandwich panel.

The insulation boards may be used on the interior face or under interior or exterior foundation walls or slab foundations as described in Section 4.2. .

### 3.0 DESCRIPTION

#### 3.1 General:

EnerSpan Insulation is expanded polystyrene (EPS) complying with ASTM C578 Types I, VIII, II, II (high density), and IX, with minimum densities of 0.90 pcf, 1.15 pcf, 1.35 pcf, 1.45 pcf, and 1.80 pcf respectively; and complying with CAN/ULC-S701 Types 1, 2, 2 (high density) and 3.

#### 3.2 Performance Characteristics:

**3.2.1 Surface Burning Characteristics:** EnerSpan Insulation has a flame spread index not exceeding 25 and a smoke developed index not exceeding 450 for thicknesses up to 6 inches, when tested in accordance with UL 723 (ASTM E84) as required by Section 2603.3 of the IBC or Section R316.3 of the IRC, as applicable. EnerSpan Insulation has a flame spread index of 230 and a smoke developed index of over 500 when tested in accordance with CAN/ULC-S102.2.

**3.2.2 Thermal Resistance:** EnerSpan Insulation has thermal resistance values as listed in Table 4.



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## 4.0 INSTALLATION

### 4.1 General:

EnerSpan Insulation must be installed in accordance with the manufacturer's published installation instructions, the applicable Code, and this Research Report. The manufacturer's published installation instructions and this Research Report must be strictly adhered to, and a copy of the instructions must be available on the jobsite during installation.

The insulation boards must be separated from the interior of the building by a thermal barrier complying with IBC Section 2603.4 or IRC Section R316.4, as applicable. See Table 2 for minimum thickness of the thermal barrier required. When using insulation boards thicker than 1-1/2 inches (38 mm) with cementitious exterior wall coatings, fasteners must be considered for lateral resistance to ensure support of the exterior wall covering.

### 4.2 Protection Against Termites:

The insulation boards may be used on the interior face, or under interior or exterior foundation walls, or slab foundations, except where the probability of termite infestation is "very heavy" as described in IBC Section 2603.8 [2603.9]. The clearance between foam plastics installed above grade and exposed earth shall be not less than 6 inches.

### 4.3 Attic and Crawl Spaces:

The insulation boards may be used for walls and ceilings of attic or crawl spaces without an ignition barrier required by IBC Section 2603.4.1.6, or IRC Sections R316.5.3 or R316.5.4 when all of the following conditions are met:

- Entry to the attic or crawl space is only to service utilities, and no storage is permitted. Utilities include, but are not limited to, mechanical equipment, electrical wiring, fans, and gas or electric hot water heaters and furnaces.
- There are no interconnected attic or basement areas.
- Air in the attic or crawl space is not circulated to other parts of the building.
- Attic ventilation is provided when required by IBC Section 1203.2 or IRC Section R806, as applicable.

- Under-floor (crawl space) ventilation is provided that complies with IBC Sections 1203.4 [1203.3] or IRC Section R408.1, as applicable.
- Combustion air is provided in accordance with IMC (*International Mechanical Code*) Section 701.
- The insulation is limited to the Type and thickness specified in Table 3.

### 4.4 Exterior Walls in Buildings Required to be of Types I, II, III, and IV Construction:

The insulation boards may be used in exterior walls of one-story buildings complying with IBC Section 2603.4.1.4. The insulation may also be used on or in exterior walls in Types I, II, III, or IV construction, when it is part of an exterior wall assembly qualified in accordance with the requirements of IBC Section 2603.5.

## 5.0 CONDITIONS OF USE

The EnerSpan Insulation described in this Research Report complies with, or is a suitable alternative to, what is specified in those Codes listed in Sections 1.0 and 2.0 of this report, subject to the following conditions:

**5.1** Installation must comply with this Research Report, the manufacturer's published installation instructions, and the applicable Code. In the event of a conflict between the manufacturer's instructions and this report, this report governs.

**5.2** Exterior walls must be protected by a water-resistive barrier complying with IBC Section 1404.2 or IRC Section R703.2, and by wall coverings that provide the necessary structural wind and seismic resistance between the wall framing members.

**5.3** The insulation boards must not be used as a nailing base for siding materials. All fasteners must penetrate through the insulation into the existing wall framing or structural sheathing as required by the wall covering manufacturer's instructions or the applicable Code.

**5.4** EnerSpan Insulation is manufactured by Plasti-Fab Ltd., at locations listed in Table 6 of this report. Each manufacturing location is under a quality control program with inspections by Intertek Testing Services NA, Inc. (AA-647).

## 6.0 SUPPORTING EVIDENCE

**6.1** Reports of tests in accordance with: CAN/ULC-S701-11 and CAN/ULC-S102.2.

**6.2** Data in accordance with the ICC-ES Acceptance Criteria for Foam Plastic Insulation (AC12), dated June 2012 (revised January 2015).

**6.3** Intertek Listing Report [Plasti-Fab Ltd. EnerSpan® Insulation](#).

## 7.0 IDENTIFICATION

EnerSpan Insulation is identified on the packaging by a marking bearing the report holder's name (Plasti-Fab Ltd.), the product name, the product EPS type, density, the manufacturing location, the Intertek Mark, the Code Compliance Research Report number (CCRR-1033), and thermal resistance value.

## 8.0 OTHER CODES

### 8.1 National Building Code of Canada (2010 Edition):

EnerSpan Insulation, with properties described in Sections 3.0, 6.0, and 7.0 of this Research Report, complies with CAN/ULC-S701 as Type 1, 2, 2 (high density), and 3 EPS, and therefore complies with the requirements of the following NBC Articles: 3.1.4.2., 3.1.5.12. [3.1.5.14.], [3.1.5.15.], 5.10.1.1., 9.10.3.2., 9.10.17.10., 9.23.17.2., and 9.25.2.2.

### 8.2 International Green Construction Code:

EnerSpan Insulation has been evaluated under the UL GREENGUARD GOLD certification program. The properties referenced therein are intended to address requirements in IgCC Section 806.6 for material emissions and Section A108.5, total VOC limit project elective. The listing may be found at the following address: <http://productguide.ulenvironment.com>.

## 9.0 CODE COMPLIANCE RESEARCH REPORT USE

**9.1** Approval of building products and/or materials can only be granted by a building official having legal authority in the specific jurisdiction where approval is sought.

**9.2** Code Compliance Research Reports shall not be used in any manner that implies an endorsement of the product by Intertek.

**9.3** Reference to the <https://bpdirectory.intertek.com> is recommended to ascertain the current version and status of this report.

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TABLE 1A – PROPERTIES EVALUATED – INTERNATIONAL CODES

PROPERTY	IBC SECTION <sup>1</sup>	IRC SECTION <sup>1</sup>	IECC SECTION <sup>1</sup>
Physical properties	N/A	R404.1.3.3.6.1	Not required
Surface burning characteristics	2603.3	R316.3	N/A
Type I – IV construction	2603.5	N/A	N/A
Thermal resistance	1301	N1101.10 [N1101.12], N1102	C303.1.1, C303.1.4, R303.1.1, R303.1.4
Thermal barrier/ignition barrier	2603.4	R316.4	N/A

<sup>1</sup> Section numbers in parentheses refer to the 2012 Code if different

TABLE 1B – PROPERTIES EVALUATED – NATIONAL BUILDING CODE OF CANADA

PROPERTY	NBC REFERENCE
Physical properties	5.10.1.1. and 9.25.2.2.
Combustible insulation and its protection	3.1.4.2., 9.10.17.10.
Combustible insulation	3.1.5.12. [3.1.5.14.]
Foamed plastic insulation	3.1.5.15.
Surface burning characteristics	3.1.12.1., 9.10.3.2.
Thermal resistance	9.25.2.1. and 9.36.2.
Thermal barrier	3.1.4.2. and 9.10.17.10.

TABLE 2 – MINIMUM INSULATION BOARD PROPERTIES AND REQUIRED THERMAL BARRIER

EPS TYPE	THERMAL BARRIER	ALLOWABLE EPS THICKNESS
ASTM C578 - TYPE I, VIII, II, II (high density), IX	Thermal barrier material as permitted in IBC Section 2603.4 or IRC Section R316.4	Max. 5 inches (127 mm)
CAN/ULC-S701 - TYPE 1, 2, 2 (high density), 3	Thermal barrier material as permitted in NBC Article 3.1.4.2., 9.10.17.10.	Min. 12.7 mm (0.5 inches)

TABLE 3 – MAXIMUM INSULATION THICKNESS FOR USE IN ATTICS OR CRAWL SPACES

ASTM C578 EPS TYPE	MAXIMUM THICKNESS
Type I	4.0 inches (101.6 mm)
Type VIII	3.2 inches (81.3 mm)
Type II	2.7 inches (67.6 mm)
Type IX	2.0 inches (50.8 mm)

TABLE 4 – THERMAL RESISTANCE BY ASTM C578 TYPE

ASTM C578 EPS TYPE	MINIMUM DENSITY (pcf)	R-VALUE @ 75°F Mean Temperature ft <sup>2</sup> •h•°F/BTU per inch
Type I	0.90	4.7
Type VIII	1.15	4.7
Type II	1.35	4.7
Type II (high density)	1.45	4.7
Type IX	1.80	4.7

TABLE 5 – THERMAL RESISTANCE BY CAN/ULC-S701 TYPE

CAN/ULC-S701 EPS TYPE	Thermal Resistance (for 25 mm thickness) m <sup>2</sup> ·°C/W
Type 1	0.82
Type 2	0.82
Type 2 (high density)	0.82
Type 3	0.82

TABLE 6 – ENERSPAN MANUFACTURING LOCATIONS

MANUFACTURING LOCATION	ASTM C578 TYPE	CAN/ULC-S701 TYPE
Ajax, Ontario, Canada	I	1
Crossfield, Alberta, Canada	VIII	-
Delta, British Columbia, Canada	II	2
Kitchener, Ontario, Canada	II (1.45 pcf)	2 (1.45)
Saskatoon, Saskatchewan, Canada	IX	3
Winnipeg, Manitoba, Canada		
Lebanon, Ohio, USA		