

UL Evaluation Report

UL ER13418-01

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UL Category Code: ULEX

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DIVISION: 07 00 00 – THERMAL AND MOISTURE PROTECTION

Sub-level 2: 07 20 00 – Thermal Protection

Sub-level 3: 07 21 00 – Thermal Insulation

Sub-level 4: 07 21 13 – Board Insulation

Sub-level 3: 07 22 00 – Roof and Deck Insulation

Sub-level 4: 07 22 16 – Roof Board Insulation

DIVISION: 31 00 00 - Earthworks

Sub-level 3: 31 23 00 - Excavation and Fill

Sub-level 4: 31 23 23 - Fill

COMPANY:

Styrotech, Inc.
8800 Wyoming Avenue North
Brooklyn Park, MN 55445
www.styrotech.com

ADDITIONAL LISTEE:

Iowa EPS Products, Inc.
5554 NE 16th St
Des Moines, IA 50313

1. SUBJECT:

STYRO-STOP ROOF INSULATION
STYRO-FLEX BUILDING INSULATION
STYRO-FLEX EIFS INSULATION



2. SCOPE OF EVALUATION

- 2018, 2015, and 2012 *International Building Code*® (IBC)
- 2018, 2015, and 2012 *International Residential Code*® (IRC)
- 2018, 2015, and 2012 *International Energy Conservation Code*® (IECC)
- ICC-ES Acceptance Criteria for Foam Plastic Insulation (AC12)
- ICC-ES Acceptance Criteria for Quality Documentation (AC10)

The products were evaluated for the following properties:

- Surface-burning Characteristics (ANSI/UL 723, ASTM E84)
- Physical Properties (ASTM C578)
- Physical Properties (ASTM D6817)
- Roofing Systems for Exterior Fire Exposure (ANSI/UL 790, ASTM E108)
- Roof Deck Construction Material With Resistance to Internal Fire Exposure (ANSI/UL1256)

3. REFERENCED DOCUMENTS

- ANSI/UL723, 10th Ed. (ASTM E84), Test for Surface Burning Characteristics of Building Materials
- ANSI/UL790, 8th Ed. (ASTM E108), Standard Test Methods for Fire Tests of Roof Coverings
- ANSI/UL 1256, 4th Ed., Fire Test of Roof Deck Constructions
- ASTM C578-15, Standard Specification for Rigid, Cellular Polystyrene Thermal Insulation
- ASTM D6817/D6817M-17, Standard Specification for Rigid Cellular Polystyrene Geofoam
- ICC-ES Acceptance Criteria for Foam Plastic Insulation (AC12), Approved June 2015 with revisions through October 2017
- ICC-ES Acceptance Criteria for Quality Documentation (AC10), January 2019

4. USES

Styro-Flex and Styro-Stop EPS Insulation boards are used as nonstructural insulation in wall cavities, behind exterior wall coverings on exterior walls where permitted by the code and in roofing applications as described in this report.

The insulation boards may be used as exterior perimeter insulation around concrete slab edges, on foundation walls, or under flat concrete slabs on grade construction, except in areas where the probability of termite activity is “very heavy” as noted in this report.

Styro-Flex EIFS EPS Insulation is for use as a nonstructural insulation on the outside faces of exterior walls as a component in Exterior Insulation and Finish Systems (EIFS), when installed in accordance with this report.

Styro-Flex Geofoam Blocks are used as lightweight structural fill in floor cavities. Installation shall be in accordance with Section 6.6 of this report.

Installation shall be in accordance with Section 6 of this report.

5. PRODUCT DESCRIPTION

The EPS Insulation boards covered in this report are molded, closed-cell expanded polystyrene boards with 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 the 2012 IBC [Section 2603.3](#) or 2012 IRC [Section R316.3](#).

The Styro-Stop Roof Insulation and Styro-Flex Building Insulation boards comply with ASTM C578 and are manufactured at minimum densities of 0.90, 1.15, 1.35, and 1.80 lb/ft³ with ASTM C578 designations of Type I, Type VIII, Type II, and Type IX, respectively.

Styro-Flex EIFS Insulation board also complies with ASTM C578 and is designated as Type I insulation.

See ASTM C578 thermal resistance requirements in Table 1 below:

Table 1. ASTM C578 Thermal Resistance Requirements

ASTM Type	Minimum Density (lb/ft ³)	Minimum Thermal Resistance ¹ (F-ft ² -h/Btu)
Type I	0.90	3.6
Type VIII	1.15	3.8
Type II	1.35	4.0
Type IX	1.80	4.2

¹Thermal resistance values are based on tested values at 1 inch thickness and 75°F mean temperature and must be multiplied by the installed thickness for thicknesses greater than 1 inch.

6. INSTALLATION

6.1 General:

The Insulation boards described in this report must be installed in accordance with the manufacturer's published installation instructions and this evaluation report. The manufacturer's published installation instructions and this report must be strictly adhered to, and a copy of the instructions shall be available on the jobsite during installation.

6.2 Styro-Stop and Styro-Flex Roof Insulation

Styro-Stop and Styro-Flex Roof Insulation are used as follows:

- As part of a UL Classified Class A, B, or C roof-covering assembly in accordance with UL 790

As part of a UL Classified Roof Deck Construction in accordance with UL 1256.**6.3 Styro-Flex Building Insulation**

Styro-Flex Building Insulation boards must be attached to the structure in a manner that will hold the insulation securely in place and must not be used structurally to resist transverse, axial, or shear loads.

The interior of the building must be separated from Styro-Flex Building Insulation boards with an approved thermal barrier, as required by the 2012 IBC [Section 2603.4](#) or the 2012 IRC [Section R316.4](#).

Styro-Flex Building Insulation boards may be used as a vapor retarder based on perm values described in Table 2 below, when required in accordance with the applicable sections of the 2018, 2015, and 2012 IBC, IRC, and IECC.

Table 2. ASTM C578 Water Vapor Permeance Requirements

ASTM Type	Minimum Density (lb/ft ³)	Maximum Water Vapor Permeance ¹ (ng/Pa-s-m ²)
Type I	0.90	5.0
Type VIII	1.15	3.5
Type II	1.35	3.5
Type IX	1.80	2.5

¹Water vapor permeance values are based on tested values at 1 inch thickness when tested in accordance with ASTM C578 and ASTM E96. Actual water vapor permeance values may be calculated based on insulation thickness, by dividing the perm value shown by the installed thickness in inches.

6.4 Styro-Flex EIFS Insulation:

Styro-Flex EIFS Insulation may be installed as part of an EIFS system in accordance with this evaluation report when data is shown that it has been evaluated for this application.

6.5 EPS Insulation Boards used on the exterior of above grade walls:

Styro-Flex Building Insulation is used on the exterior of above grade walls as follows:

- Exterior walls of one- and two- family dwellings in accordance with the 2018, 2015, and 2012 IRC.
- Exterior walls of one story buildings of Type I, II, III, or IV constructions in accordance with 2012 IBC [Section 2603.4.1.4](#).
- Exterior walls of Type V construction in accordance with 2012 IBC Sections [2603.2](#), [2603.3](#), and [2603.4](#).

6.6 Styro-Flex EPS geofoam insulation:

Styro-Flex EPS geofoam insulation blocks are placed loosely on a level surface or existing structural slab. The blocks may be installed in a single layer or in multiple layers.

Structural loads on the Styro-Flex EPS geofoam blocks shall not exceed the compressive resistance at 1% strain in accordance with ASTM D6817. Additional design considerations are included in ASTM D7180, "Standard Guide for Use of Expanded Polystyrene (EPS) Geofoam" and ASTM D7557, "Standard Practice for Sampling of Expanded Polystyrene Geofoam Specimens". When Styro-Flex EPS geofoam blocks are less than 4 inches in thickness, the interior of the building must be separated from the geofoam blocks with a thermal barrier as required by Section [2603.4](#) of the IBC or Section [R316.4](#) of the IRC, as applicable.

When Styro-Flex EPS geofoam insulation blocks are greater than 4 inches in thickness, a minimum 1 inch concrete or masonry must cover the geofoam blocks on all faces.

Styro-Flex I Geofoam EPS15, EPS19, EPS22, and EPS29 blocks are manufactured at minimum densities of 0.90, 1.15, 1.35, and 1.80 lbs/ft³ and comply with ASTM D6817 designations of EPS12, EPS15, EPS19, EPS22, EPS29, EPS39, and EPS46 respectively. See Table 3.

Table 3 – Compressive Resistance of Styro-Flex geofoam Block

PRODUCT	ASTM D6817 Type	DENSITY, min., lb/ft ³	COMPRESSIVE RESISTANCE AT 1% STRAIN, min., psi
Styro-Flex Geofoam	EPS15	0.90	3.6
Styro-Flex Geofoam	EPS19	1.15	5.8
Styro-Flex Geofoam	EPS22	1.35	7.3
Styro-Flex Geofoam	EPS29	1.80	10.9

7. CONDITIONS OF USE**7.1 General:**

The Insulation boards described in this report comply with, or are suitable alternatives to what is specified in, those codes listed in Section 2 of this report, subject to the following conditions:

- 7.2** The Insulation boards described in this report must be produced, identified, and installed in accordance with the manufacturer's published installation instructions and the applicable code. If there is a conflict between this report and the manufacturer's instructions, this report shall govern.
- 7.3** In areas when the probability of termite infestation is defined as "very heavy", the Styro-Stop and Styro-Flex Insulation boards must be installed in accordance with 2012 IBC [Section 2603.9](#) or 2012 IRC [Section R318.4](#), as applicable.
- 7.4** The Styro-Flex Building Insulation boards described in this report must be separated from the building interior with a thermal barrier, such as ½ in. gypsum board, as required by 2012 IBC [Section 2603.4](#) or 2012 IRC [Section R316.4](#).
- 7.5** See UL Product iQ™ database for Foamed Plastic, UL Classified for Surface Burning Characteristics in accordance with UL 723 ([BRYX.R13418](#), [BRYX.R10355](#)).
- 7.6** See UL Product iQ™ database for Polystyrene, Thermal Insulation, Rigid Cellular, UL Classified in accordance with ASTM C578 and ASTM D6817 ([QORW.R13418](#), [QORW.R10355](#)).
- 7.7** See UL Product iQ™ database for Roofing Systems, UL Classified in accordance with UL 790 ([TGFU.R13418](#), [TGFU.R10355](#)).
- 7.8** See UL Product iQ™ database for Roof Deck Constructions (Nos. [292](#), [458](#), [631](#), [666](#), [667](#), [669](#), [681](#), [683](#)).
- 7.9** The products described in this report are manufactured at the location(s) named below, under the UL LLC Classification and Follow-Up Service Program, which includes inspections in accordance with the quality elements of ICC-ES Acceptance Criteria for Quality Documentation, AC 10.

Table 4 - Manufacturing Locations

Listee	Location
Styrotech Inc.	8800 Wyoming Ave N Brooklyn Park, MN 55445
Iowa EPS Products	5554 NE 16 th St Des Moines, IA 50313

8. SUPPORTING EVIDENCE

- 8.1 Data in accordance with ICC-ES Acceptance Criteria for Foam Plastic Insulation (AC12), dated June 2015.
- 8.2 UL Classification reports in accordance with UL 723, ASTM C578, ASTM D6817, and UL 790. See the UL Product Certification Categories BRYX, QORW, and TGFU, respectively.
- 8.3 Roof Deck Constructions (Nos. [292](#), [458](#), [631](#), [666](#), [667](#), [669](#), [681](#), [683](#)).

9. IDENTIFICATION

The Styro-Stop Roof Insulation, Styro-Flex Building Insulation, and Styro-Flex EIFS Insulation described in this evaluation report are identified by a marking bearing the report holder's name (Styrotech Inc. or Iowa EPS Products Inc.), the plant identification, the UL Classification Mark, and the evaluation report number ER13418-01. The validity of the evaluation report is contingent upon this identification appearing on the product or UL Classification Mark certificate.

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- 10.3 The status of this report, as well as a complete directory of UL Evaluation Reports may be found at UL.com via the [Product iQ™ database](#).

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