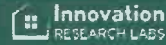




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ESR-1498

Reissued 12/2016

This report is subject to renewal 12/2018.

DIVISION: 07 00 00—THERMAL AND MOISTURE PROTECTION

SECTION: 07 21 00—THERMAL INSULATION

REPORT HOLDER:

STYROPEK USA, INC.

**16945 NORTHCHASE DRIVE, SUITE 1560
HOUSTON, TEXAS 77060**

EVALUATION SUBJECT:

EXPANDABLE POLYSTYRENE BEADS: STYROPEK® TYPES (F95)BF AND (F95)BFL



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DIVISION: 07 00 00—THERMAL AND MOISTURE PROTECTION

Section: 07 21 00—Thermal Insulation

REPORT HOLDER:

STYROPEK USA, INC.
 16945 NORTHCHASE DRIVE, SUITE 1560
 HOUSTON, TEXAS 77060
 (283) 876 3330

EVALUATION SUBJECT:

EXPANDABLE POLYSTYRENE BEADS: STYROPEK® TYPES (F95)BF AND (F95)BFL

1.0 EVALUATION SCOPE

Compliance with the following codes:

- 2015, 2012, 2009 and 2006 *International Building Code*® (IBC)
- 2015, 2012, 2009 and 2006 *International Residential Code*® (IRC)
- 2015, 2012, 2009 and 2006 *International Fire Code*® (IFC)
- 2015, 2012, 2009 and 2006 *International Energy Conservation Code*® (IECC)
- 2013 *Abu Dhabi International Building Code* (ADIBC)[†]

[†]The ADIBC is based on the 2009 IBC. 2009 IBC code sections referenced in this report are the same sections in the ADIBC.

- Other Code (see Section 8.0)

Properties evaluated:

- Physical properties
- Surface-burning characteristics
- Attic and crawl space evaluation

2.0 USES

STYROPEK polystyrene beads are used by independent manufacturers in the production of expanded polystyrene (EPS) insulation products.

3.0 DESCRIPTION

STYROPEK expandable polystyrene beads designated as STYROPEK® Types (F95)BF and (F95)BFL, are used by independent manufacturers to produce EPS insulation boards. Boards manufactured with the STYROPEK beads are produced through the introduction of heat. This process expands the beads which are then molded into

insulation boards with maximum densities and thicknesses no greater than those specified in Table 1. EPS boards formed from STYROPEK® beads have thermal resistance values as noted in Table 2. The end use of the polystyrene beads, including the manufacture of boards, is outside the scope of this report and must be addressed in a separate evaluation report. At densities and thicknesses no greater than those specified in Table 1, insulation boards produced from the STYROPEK® beads have a flame-spread index of 25 or less and a smoke-developed index of 450 or less when tested in accordance with ASTM E84.

The expandable beads have been qualified in accordance with Section 4.5.15.1 of the ICC-ES Acceptance Criteria for Foam Plastic Insulation (AC12). The boards can be used to produce expanded polystyrene products that comply with the ASTM C578 (with types as noted in Table 1), provided the final product is recognized in a current ICC-ES evaluation report and has been qualified in accordance with Section 4.5.15.1.2 of AC12.

4.0 INSTALLATION

4.1 General:

Installation must be as noted in the corresponding ICC-ES evaluation report on the foam plastic assembly, or as otherwise permitted in applicable codes noted in Section 1.0 of this report.

4.2 Installation in Attics or Crawl Spaces:

Insulation boards produced from STYROPEK® Types (F95)BF and (F95)BFL beads can be used in attics or 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:

1. Entry to the attic or crawl space is only to service utilities, and no storage is permitted.
2. There are no interconnected attic or crawl space areas.
3. Air in the attic or crawl space is not circulated to other parts of the building.
4. 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.
5. Combustion air is provided in accordance with Section 701 of the *International Mechanical Code* (IMC) or Sections 701 and 703 of the 2006 IMC, as applicable.

6. The boards are produced from STYROPEK® Types (F95)BF and (F95)BFL, beads, and have a maximum thickness of 6.0 inches (102 mm) at 1.0 pcf (16.0 kg/m³), a maximum thickness of 3.25 inches (50.8 mm) at 2.0 pcf (32.0 kg/m³), or intermediate density and thickness combinations not to exceed the equivalent mass of 3.25 inches (50.8 mm) at 2.0 pcf (32.0 kg/m³) density boards.

5.0 CONDITIONS OF USE

The STYROPEK® Types (F95)BF and (F95)BFL expandable polystyrene beads described in this report comply with, or are suitable alternatives to what is specified in, those codes listed in Section 1.0, subject to the following conditions:

- 5.1 The maximum density and thickness of the insulation boards produced from the expanded beads are as noted in Table 1.
- 5.2 Products manufactured from the polystyrene beads described in this report must be recognized in a current ICC-ES evaluation report.
- 5.3 Insulation boards produced from STYROPEK® beads must be separated from the building interior by a thermal barrier complying with IBC Section 2603.4, IRC Section R316.4 (Section R314.4 for the 2006 IRC), or IFC Section 803.7.2, as applicable.
- 5.4 Boards produced from the STYROPEK® beads can be used in attic and crawl spaces without an ignition barrier as described in Section 4.2.
- 5.5 The STYROPEK® Types (F95)BF and (F95)BFL beads are produced by STYROPEK’s Mexican branch, STYROPEK DE MEXICO SA DE CV at Altamira, Tamaulipas, Mexico, with quality control inspections by ICC-ES.

6.0 EVIDENCE SUBMITTED

Data in accordance with the ICC-ES Acceptance Criteria for Foam Plastic Insulation (AC12), dated June 2015 (editorially revised May 2016), including data in accordance with Appendix B.

7.0 IDENTIFICATION

The bead containers must bear a label noting the component designation; the name and address of STYROPEK; the evaluation report number (ESR-1498); and the lot number.

8.0 OTHER CODES

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 1997 *Uniform Building Code*® (UBC).

The STYROPEK® Types, (F95)BF and (F95)BFL expandable polystyrene beads comply with the UBC as described in Sections 2.0 to 7.0 of this report, with the revisions noted below:

- **Installation:** Same as Section 4.0, except replace item 4 in Section 4.2 with the following: Attic ventilation must be provided in accordance with UBC Section 1505, and under-floor (crawl space) ventilation must be provided that complies with UBC Section 2306.7.
- **Conditions of Use:** Same as Section 5.0, except replace the wording in Section 5.3 with the following: Insulation boards produced from STYROPEK® beads must be separated from the building interior by a thermal barrier complying with UBC Section 2602.4.

TABLE 1—MAXIMUM INSULATION BOARD DENSITY AND THICKNESS

BEAD TYPE	ASTM C578 Types	BEAD SIZE	MAXIMUM DENSITY (pcf)	MAXIMUM THICKNESS (inches)
(F95)BF	I, II, VIII, IX	195, 295, 295M, 395, 395S, 495	1.25	6
			2.0	5
(F95)BFL	I, II, VIII, IX	295, 395, 397, 397S, 495	1.25	6
			2.0	5

For SI: 1 inch = 25.4 mm, 1 pcf = 16.02 kg/m³.

TABLE 2—THERMAL RESISTANCE OF EPS FOAM PLASTIC INSULATION

EPS TYPE	MINIMUM DENSITY (pcf)	R-VALUE PER INCH OF THICKNESS (°F·ft ² ·h/Btu)
I	0.90	3.6
VIII	1.15	3.8
II	1.35	4.00
IX	1.80	4.20

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

ICC-ES Evaluation Report

ESR-1498 FBC Supplement

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(283) 876-3330

EVALUATION SUBJECT:

EXPANDABLE POLYSTYRENE BEADS: STYROPEK® TYPES (F95)BF AND (F95)BFL

1.0 REPORT PURPOSE AND SCOPE

Purpose:

The purpose of this evaluation report supplement is to indicate that STYROPEK® Types (F95)BF and (F95)BFL expandable polystyrene beads, recognized in ICC-ES master report ESR-1498, have also been evaluated for compliance with the codes noted below.

Applicable code editions:

- 2014 *Florida Building Code—Building*
- 2014 *Florida Building Code—Residential*

2.0 CONCLUSIONS

The STYROPEK® Types (F95)BF and (F95)BFL expandable polystyrene beads described in Sections 2.0 through 7.0 of the master evaluation report, ESR-1498, comply with the *Florida Building Code—Building* and the *Florida Building Code—Residential*, provided the installation is in accordance with the 2012 *International Building Code*® (IBC) provisions noted in the master report.

Use of STYROPEK® Types (F95)BF and (F95)BFL expandable polystyrene beads has also been found to be in compliance with the High-Velocity Hurricane Zone provisions of the *Florida Building Code—Building* and the *Florida Building Code—Residential*.

For products falling under Florida Rule 9N-3, verification that the report holder's quality-assurance program is audited by a quality-assurance entity approved by the Florida Building Commission for the type of inspections being conducted is the responsibility of an approved validation entity (or the code official, when the report holder does not possess an approval by the Commission).

This supplement expires concurrently with the master report, reissued December 2016.