ICC-ES Evaluation Report

ESR-1498

Reissued December 2023

Revised August 2024

Subject to renewal December 2024

This report also contains:

- FBC Supplement

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DIVISION: 07 00 00 — THERMAL AND MOISTURE PROTECTION Section: 07 21 00 — Thermal Insulation	REPORT HOLDER: STYROPEK USA, INC.	EVALUATION SUBJECT: EXPANDABLE POLYSTYRENE BEADS: STYROPEK® TYPES (F95)BF, (F95)BFM AND (F95)BFL	

1.0 EVALUATION SCOPE

Compliance with the following codes:

- 2024, 2021, 2018, 2015, 2012, 2009 and 2006 *International Building Code*® (IBC)
- 2024, 2021, 2018, 2015, 2012, 2009 and 2006 *International Residential Code*® (IRC)
- 2024, 2021, 2018, 2015, 2012, 2009 and 2006 *International Fire Code*® (IFC)
- 2024, 2021, 2018, 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, (F95)BFM and(F95)BFL, are used by independent manufacturers to produce expanded polystyrene (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 EPS insulation product, or as otherwise permitted by the code official under Section 2603 of the IBC or Section R316 of the IRC, as applicable.

4.2 Installation in Attics or Crawl Spaces:

Insulation boards produced from STYROPEK® Types (F95)BF, (F95)BFM and (F95)BFL beads can be used in attics or crawl spaces without a code-prescribed ignition barrier 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 2024, 2021 and 2018 IBC Section 1202.2 (2015, 2012, 2009 and 2006 IBC Section 1203.2) or IRC Section R806, as applicable. Under-floor (crawl space) ventilation is provided when required by 2024, 2021 and 2018 IBC Section 1202.4 (2015, 2012, 2009 and 2006 IBC Section 1203.3) or IRC Section R408.1, as applicable.
5. Combustion air is provided in accordance with 2024, 2021, 2018, 2015, 2012 and 2009 Section 701 of the *International Mechanical Code*® (IMC) (Sections 701 and 703 of the 2006 IMC), as applicable.
6. The boards are produced from STYROPEK® Types (F95)BF, (F95)BFM and (F95)BFL, beads, and have a maximum thickness of 6.0 inches (152.4 mm) at 1.0 pcf (16.0 kg/m^3), a maximum thickness of 3^1/$_4$ inches (82.6 mm) at 2.0 pcf (32.0 kg/m^3), or intermediate density and thickness combinations not to exceed the equivalent mass of 3^1/$_4$ inches (82.6 mm) at 2.0 pcf (32.0 kg/m^3) density boards.

5.0 CONDITIONS OF USE

The STYROPEK® Types (F95)BF, (F95)BFM 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 of this report.

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 2024, 2021 and 2018 IFC Section 803.11.2 [2015 IFC Section 803.8.2 (2012, 2009 and 2006 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, (F95)BFM and (F95)BFL beads are produced under a quality control program with 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 June 2024), including data in accordance with Appendix B (NFPA 286).

7.0 IDENTIFICATION

7.1 The ICC-ES mark of conformity, electronic labeling, or the evaluation report number (ICC-ES ESR-1498) along with the name, registered trademark, or registered logo of the report holder (STYROPEK USA, INC.) must be included in the product label.

7.2 In addition, each bead container must bear a label noting the component designation and the lot number.

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

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

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, (F95)BFM 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, 495A	1.25 2.0	6 5
(F95)BFM	I, II, VIII, IX	295, 395, 397, and 495,	1.25 2.0	6 5
(F95)BFL	I, II, VIII, IX	295, 395, 397, 397S, 495	1.25 2.0	6 5

For **SI:** 1 inch = 25.4 mm, 1 pcf = 16.02 kg/m^3.

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/m^3, 1°F·ft^2·hr/Btu = 0.176 m^2·K/W, 1°F = 1.8°C+32.

DIVISION: 07 00 00—THERMAL AND MOISTURE PROTECTION
Section: 07 21 00—Thermal Insulation

REPORT HOLDER:

STYROPEK USA, INC.

EVALUATION SUBJECT:

EXPANDABLE POLYSTYRENE BEADS: STYROPEK® TYPES (F95)BF, (F95)BFM 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, (F95)BFM and (F95)BFL expandable polystyrene beads, described in ICC-ES evaluation report ESR-1498, have also been evaluated for compliance with the codes noted below.

Applicable code editions:

- 2023 *Florida Building Code—Building*
- 2023 *Florida Building Code—Residential*

2.0 CONCLULSIONS

The STYROPEK® Types (F95)BF, (F95)BFM and (F95)BFL expandable polystyrene beads described in Sections 2.0 through 7.0 of the evaluation report, ESR-1498, comply with the *Florida Building Code—Building* and the *Florida Building Code—Residential*, as applicable. The design requirements must be determined in accordance with the *Florida Building Code—Building* and the *Florida Building Code—Residential*, as applicable. The installation requirements noted in the ICC-ES evaluation report ESR-1498 for the 2021 *International Building Code®* (IBC) meet the requirements of the *Florida Building Code—Building* and the *Florida Building Code—Residential*, as applicable, with the following condition:

The products manufactured from the beads must be described in a current ICC-ES evaluation report that has a current Florida Building Code Supplement.

Use of STYROPEK® Types (F95)BF, (F95)BFM and (F95)BFL expandable polystyrene beads have 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 61G20-3, 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 evaluation report, reissued December 2023 and revised August 2024.