

# ICC-ES Evaluation Report

**ESR-1798\***

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This report is subject to re-examination in two years.

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**DIVISION: 07—THERMAL AND MOISTURE PROTECTION**  
**Section: 07210—Building Insulation**
**REPORT HOLDER:**
**NOVA CHEMICALS INC.**  
**400 FRANKFORT ROAD**  
**MONACA, PENNSYLVANIA 15061**  
**(724) 774-1000**  
[www.novachem.com](http://www.novachem.com)
**EVALUATION SUBJECT:**
**EXPANDABLE POLYSTYRENE (EPS) BEADS**
**1.0 EVALUATION SCOPE**
**Compliance with the following codes:**

- 2003 *International Building Code*® (IBC)
- 2003 *International Residential Code*® (IRC)
- BOCA® *National Building Code*/1999 (BNBC)
- 1999 *Standard Building Code*® (SBC)
- 1997 *Uniform Building Code*™ (UBC)

**Properties evaluated:**

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

**2.0 USES**

The NOVA Chemicals Inc. expandable polystyrene beads are used by independent manufacturers to produce expanded polystyrene (EPS) insulation products.

**3.0 DESCRIPTION**

The expandable polystyrene beads are designated as resin Types 33M, 35M, M77, and M97. The EPS insulation products manufactured from the beads are produced through the introduction of steam, without additives. This process expands the beads, which are then molded into insulation products, with maximum thicknesses and densities as noted in Table 1. At densities and thicknesses no greater than those specified in Table 1, EPS insulation products produced from the 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 E 84 (UBC Standard 8-1). The end use of the EPS beads, including

the manufacture of the EPS products, is outside the scope of this report and shall be addressed in a separate evaluation report.

Type 33M, 35M, M77 and M97 EPS beads can be used to produce EPS products that comply with Types I, II and VIII [1.0, 1.5, and 1.25 pcf (16, 24, and 20 kg/m<sup>3</sup>) nominal densities, respectively] of ASTM C 578-01, and have been qualified in accordance with Section 4.5.15.1.1 of the ICC-ES Acceptance Criteria for Foam Plastic Insulation (AC12). Type M77 and M97 EPS beads can also be used to produce EPS insulation products that comply with Type IX [2.0 pcf (32 kg/m<sup>3</sup>) nominal density] of ASTM C 578-01, and have been qualified in accordance with Section 4.5.15.1.1 of AC12. See Table 1 for maximum thicknesses.

**4.0 INSTALLATION**
**4.1 General:**

Installation shall be as noted in the corresponding current ICC-ES evaluation report on the EPS insulation product, or as otherwise permitted by the code official under Section 2603 of the IBC, BNBC, or SBC; Section R314 of the IRC; or Section 2602 of the UBC, as applicable.

**4.2 Special Use:**

EPS insulation products produced from the EPS beads of the resin type, density, and thickness shown in Table 2 of this report can be used on walls in attics and crawl spaces without covering applied to the attic or crawl space side of the foam plastic, provided all of the following conditions are met:

- a. Entry to the crawl space is only to service utilities, and no storage is permitted.
- b. There are no interconnected attic or crawl space areas.
- c. Air in the attic or crawl space is not circulated to other parts of the building.
- d. Attic ventilation is provided when required by IBC Section 1203.2, IRC Section R806, UBC Section 1505, SBC Section 2309.7, and BNBC Section 1210.1, as applicable.
- e. Under-floor (crawl space) ventilation is provided when required by IBC Section 1203.3, IRC Section R408.1, UBC Section 2306.7, SBC Section 1804.6.3.1, and BNBC Section 1210.2, as applicable.
- f. Combustion air is provided in accordance with Sections 701 and 703 of the *International Mechanical Code*.

\*Revised April 2010

**5.0 CONDITIONS OF USE**

The 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 of this report, subject to the following conditions:

- 5.1 The maximum density and thickness of the EPS insulation boards produced from the expanded beads shall be as noted in Table 1 of this report.
- 5.2 Products manufactured from the EPS beads shall be recognized in a current ICC-ES evaluation report.
- 5.3 Except as noted in Section 4.2 of this report, the EPS insulation products produced from the EPS beads shall be separated from the building interior by a thermal barrier complying with IBC Section 2603.4, IRC Section R314.1.2, UBC Section 2602.4, SBC Section 2603.5, and BNBC Section 2603.4, as applicable.

5.4 The beads are manufactured in Monaca, Pennsylvania, and Painesville, Ohio, under a quality control program with inspections by Underwriters Laboratories Inc. (AA-668).

**6.0 EVIDENCE SUBMITTED**

Data in accordance with the ICC-ES Acceptance Criteria for Foam Plastic Insulation (AC12), dated June 2009, including data in accordance with Appendix B.

**7.0 IDENTIFICATION**

Each container of beads shall bear a label with the NOVA Chemicals Inc. name and address, the bead type, the name or mark of the inspection agency (Underwriters Laboratories Inc.), and the evaluation report number (ESR-1798).

**TABLE 1—MAXIMUM EPS PRODUCT DENSITY AND THICKNESS WHEN MADE WITH NOVA CHEMICALS BEADS**

EPS TYPE	NOMINAL DENSITY (pcf)	MAXIMUM THICKNESS (inches)			
		33M	35M	M77	M97
I	1.0	5	5	6	6
VIII	1.25	5	5	6	6
II	1.5	6	6	6	6
IX	2.0	-	-	6	6

For SI: 1 inch = 25.4 mm, 1 pcf = 16.02 kg/m<sup>3</sup>.

**TABLE 2—MAXIMUM DENSITY FOR EPS PRODUCTS USED IN ATTICS OR CRAWL SPACES**

NOMINAL DENSITY (pcf)	MAXIMUM THICKNESS (inches)		
	35M	M77	M97
1.0	4	4	4
2.0	-	2	2

For SI: 1 inch = 25.4 mm, 1 pcf = 16.02 kg/m<sup>3</sup>.