



Most Widely Accepted and Trusted

ICC-ES Report

ESR-2784

ICC-ES | (800) 423-6587 | (562) 699-0543 | www.icc-es.org

Reissued 04/2015

This report is subject to renewal 04/2017

DIVISION: 07 00 00—THERMAL AND MOISTURE PROTECTION
SECTION: 07 21 00—THERMAL INSULATION

REPORT HOLDER:

BASF CORPORATION

**1609 BIDDLE AVENUE
WYANDOTTE, MICHIGAN 48192**

EVALUATION SUBJECT:

**BASF NEOPOR® EXPANDABLE POLYSTYRENE BEADS 2200, F2200, 2300, F2300,
2400, F2400, 5300, F5300 AND F5300 PLUS**



Look for the trusted marks of Conformity!

“2014 Recipient of Prestigious Western States Seismic Policy Council (WSSPC) Award in Excellence”



A Subsidiary of

ICC-ES Evaluation Reports are not to be construed as representing aesthetics or any other attributes not specifically addressed, nor are they to be construed as an endorsement of the subject of the report or a recommendation for its use. There is no warranty by ICC Evaluation Service, LLC, express or implied, as to any finding or other matter in this report, or as to any product covered by the report.



ICC-ES Evaluation Report

ESR-2784*

Reissued April 2015

This report is subject to renewal April 2017.

www.icc-es.org | (800) 423-6587 | (562) 699-0543

A Subsidiary of the International Code Council®

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

BASF CORPORATION
 1609 BIDDLE AVENUE
 WYANDOTTE, MICHIGAN 48192
 (734) 324-6904
www.basf.com

EVALUATION SUBJECT:

**BASF NEOPOR® EXPANDABLE POLYSTYRENE BEADS
 2200, F2200, 2300, F2300, 2400, F2400, 5300, F5300 AND
 F5300 PLUS**

1.0 EVALUATION SCOPE
Compliance with the following codes:

- 2012 and 2009 *International Building Code*® (IBC)
- 2012 and 2009 *International Residential Code*® (IRC)
- 2012 and 2009 *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.

Properties evaluated:

- Physical properties
- Surface-burning characteristics
- Thermal resistance

2.0 USES

The BASF expandable polystyrene beads designated as NEOPOR® 2200, NEOPOR® F2200, NEOPOR® 2300, NEOPOR® F2300, NEOPOR® 2400, NEOPOR® F2400, NEOPOR® 5300, NEOPOR® F5300 and NEOPOR® F5300 Plus are used by independent manufacturers to produce expanded polystyrene (EPS) insulation products.

3.0 DESCRIPTION

The BASF NEOPOR® 2200, NEOPOR® F2200, NEOPOR® 2300, NEOPOR® F2300, NEOPOR® 2400, NEOPOR® F2400, NEOPOR® 5300, NEOPOR® F5300 and NEOPOR® F5300 Plus beads have the same formulation of polystyrene, with the only difference being the diameter of the beads. The EPS insulation products manufactured with the expandable polystyrene beads are produced solely through the introduction of heat, without other additives. This process expands the beads, which are then

molded into insulation products with minimum densities and maximum thickness as specified in Table 1. The end use of the polystyrene beads, including the manufacture of products, is outside the scope of this report and must be addressed in a separate evaluation report.

Boards manufactured from BASF NEOPOR® 2200, NEOPOR® F2200, NEOPOR® 2300, NEOPOR® F2300, NEOPOR® 2400, NEOPOR® F2400, NEOPOR® 5300, NEOPOR® F5300 and NEOPOR® F5300 Plus beads, at thicknesses and densities no greater than those specified in Table 1 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 (UBC Standard 8-1). Thicknesses of up to 12 inches (304.8 mm) in walls and ceilings are recognized when the EPS is separated from the interior of the building by minimum 5/8-inch-thick (19.1 mm), Type X gypsum board complying with ASTM C1396, attached in accordance with the applicable code.

BASF NEOPOR® 2200, NEOPOR® F2200, NEOPOR® 2300, NEOPOR® F2300, NEOPOR® 2400 and NEOPOR® F2400 expandable polystyrene beads have been qualified in accordance with Section 4.5.15.1.1 of the ICC-ES Acceptance Criteria for Foam Plastic Insulation (AC12). The expandable beads can be used to produce EPS products that comply with Types II, VIII and IX [1.35, 1.15 and 1.80 pcf (22, 18 and 29 kg/m³) minimum densities, respectively] of ASTM C578, 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.

BASF NEOPOR® 5300, NEOPOR® F5300 and NEOPOR® F5300 Plus expandable polystyrene beads have been qualified in accordance with Section 4.5.15.1.1 of the ICC-ES Acceptance Criteria for Foam Plastic Insulation (AC12). The expandable beads can be used to produce EPS products that comply with Types I, II, VIII and IX [0.90, 1.35, 1.15 and 1.80 pcf (14, 22, 18 and 29 kg/m³) minimum densities, respectively] of ASTM C578 (see Tables 1 and 2), 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.

The *R*-values noted in Table 3 are only applicable to EPS products produced from BASF NEOPOR® 2200, NEOPOR® F2200, NEOPOR® 2300, NEOPOR® F2300, NEOPOR® 2400, NEOPOR® F2400, NEOPOR® 5300, NEOPOR® F5300 and NEOPOR® F5300 Plus beads with the EPS products recognized with the noted *R*-values in a current ICC-ES evaluation report. The products

*Revised June 2015

must comply with ICC-ES qualification and labeling requirements, and must be manufactured under a quality control system meeting both BASF specifications and ICC-ES requirements.

4.0 INSTALLATION

4.1 General:

Installation must 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 or Section R316 of the IRC, as applicable.

4.2 Attics and Crawl Spaces:

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 attic or 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 or IRC Section R806, as applicable.
- e. Under-floor (crawl space) ventilation is provided when required by IBC Section 1203.3 or IRC Section R408.1, as applicable.
- f. Combustion air is provided in accordance with Section 701 of the *International Mechanical Code*[®].
- g. The EPS type and maximum thickness are as specified in Table 2.

5.0 CONDITIONS OF USE

The BASF NEOPOR[®] 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 minimum density and maximum thickness of the foam plastic insulation products manufactured from the expanded beads are as noted in Table 1 of this report.
- 5.2 Products manufactured from the beads must 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 must be separated from the building interior by a thermal barrier complying with IBC Section 2603.4 or IRC Section R316.4 or as applicable.
- 5.4 The beads are produced in Ludwigshafen, Germany, 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 2012 (editorially revised August 2013), including data in accordance with NFPA 286.

7.0 IDENTIFICATION

Each container of beads bears a label with the manufacturer's name (BASF SE or BASF Company Ltd.) and address; the bead identification (series); the evaluation report number (ESR-2784).

TABLE 1—MINIMUM INSULATION BOARD DENSITY AND MAXIMUM THICKNESS

| NEOPOR [®] GRADE DESIGNATION | ASTM C578 EPS TYPE | MINIMUM DENSITY (pcf) | MAXIMUM THICKNESS (INCHES) |
|---|--------------------|-----------------------|----------------------------|
| 5300,F5300,F5300 Plus | I | 0.90 | 6 |
| 2200,2300,2400,5300,F2200,F2300, F2400, F5300, F5300 Plus | VIII | 1.15 | 6 |
| 2200,2300,2400,5300,F2200,F2300, F2400, F5300, F5300 Plus | II | 1.35 | 6 |
| 2200,2300,2400,5300,F2200,F2300, F2400, F5300, F5300 Plus | IX | 1.80 | 6 |

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

¹Except as noted in Section 3.0.

TABLE 2—TYPE AND MAXIMUM THICKNESS FOR EPS PRODUCTS USED IN ATTICS OR CRAWL SPACES

| NEOPOR [®] GRADE DESIGNATION | ASTM C578 EPS TYPE | MAXIMUM THICKNESS (INCHES) |
|--|--------------------|----------------------------|
| 5300,F5300,F5300 Plus | I | 4.0 |
| 2200,2300,2400,5300,F2200, F2300, F2400, F5300, F5300 Plus | VIII | 3.2 |
| 2200,2300,2400,5300,F2200, F2300, F2400, F5300, F5300 Plus | II | 2.66 |
| 2200,2300,2400,5300,F2200, F2300, F2400, F5300, F5300 Plus | IX | 2 |

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

TABLE 3—MINIMUM DENSITY AND R-VALUE

| ASTM C578 EPS TYPE | MINIMUM DENSITY (pcf) | R-VALUE (°F-ft ² -h/Btu) 75°F MEAN TEMP. | R-VALUE (°F-ft ² -h/Btu) 40°F MEAN TEMP. |
|--------------------|-----------------------|---|---|
| I | 0.90 | 4.3 | 4.7 |
| VIII | 1.15 | 4.5 | 4.8 |
| II | 1.35 | 4.5 | 4.9 |
| II | 1.45 | 4.6 | 4.9 |
| IX | 1.80 | 4.6 | 4.9 |

For SI: 1 inch = 25.4 mm, 1 pcf = 16.02 kg/m³, 1 °F-ft²-h/Btu = 0.176 m²-K/W.