

ICC-ES Evaluation Report

ESR-2222*

Issued March 1, 2009

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:
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EVALUATION SUBJECT:
P-2000 INSULATION SYSTEMS RPR OR WPR
1.0 EVALUATION SCOPE
Compliance with the following codes:

- 2006 *International Building Code*® (IBC)
- 2006 *International Energy Conservation Code*® (IECC)
- 2006 *International Residential Code*® (IRC)

Properties evaluated:

- Physical properties
- Thermal resistance (*R*-values)
- Surface-burning characteristics
- Vapor resistance

2.0 USES

Proactive Technology, Inc., P-2000 Insulation Systems RPR and WPR are expanded polystyrene foam plastic boards for use as nonstructural thermal insulation in buildings of Type V-B construction (IBC) and structures constructed in accordance with the IRC. The boards are used as general insulation board on the exterior side of exterior walls, in wall cavities and in ceiling assemblies. The boards are also used as roof insulation when evaluated as components of a roof-covering assembly in a current ICC-ES evaluation report, and in exterior cementitious wall coating systems when listed as a component of such systems in a current ICC-ES evaluation report.

3.0 DESCRIPTION
3.1 General:

The insulation boards are faced expanded polystyrene foam plastic, complying with ASTM C578. The boards are manufactured from BASF beads recognized in [ESR-1498](#),

have nominal thicknesses of $\frac{3}{8}$, $\frac{5}{8}$ and 1 inch (9.53, 15.88 and 25.4 mm), have a nominal density of 1.0 pcf (16 kg/m³), and have two facing options, RPR and WPR. P-2000 RPR is faced on both sides with a metalized reflective film having a nominal thickness of 0.005 inch (0.127 mm). P-2000 WPR is faced on one side with the same metalized reflective film as the RPR, and on the other side with 0.001-inch-thick (0.025 mm) white polypropylene. P-2000 is available in standard-sheet sizes of 4 by 8 feet, 4 by 10 feet, and 4 by 12 feet (1219 by 2438, 3048, and 3658 mm), with square edges.

3.2 Surface-burning characteristics:

The foam plastic insulation boards exhibit a flame-spread index of 25 or less and a smoke-development index of 450 or less when tested in accordance with ASTM E 84 at a 1-inch (25.4 mm) thickness and a nominal density of 1.0 pcf (20.8 kg/m³).

3.3 Thermal resistance (*R*-value):

R-values are as described in Section 4.2 of this report.

3.4 Vapor Retarder

The foam plastic insulation board has a vapor permeability of less than 1 perm (5.7 x 10⁻¹¹ kg / Pa • s • m²) when applied at a minimum thickness of 1 inch (25.4 mm) and qualifies as a vapor retarder.

4.0 INSTALLATION
4.1 General:

The P-2000 RPR and WPR insulation boards must be installed in accordance with this report and the manufacturer's published instructions. The manufacturer's published installation instructions must be available at the jobsite at all times during installation.

The interior of the building must be separated from the insulation boards with an approved thermal barrier as required by IBC Section 2603.4 or IRC Section R314.4. The use of the insulation boards in areas of "very heavy" termite infestation probability must comply with IBC Section 2603.8 or IRC Section R320.5. A water-resistive barrier must be provided over the insulation boards in accordance with IBC Section 1404.2 or IRC Section R703.2, as applicable. The insulation board may be applied to exterior faces of walls. The attachment of finish materials over the insulation board must allow for a minimum 1-inch (25.4 mm) penetration of the fasteners into wood framing. Sheathing or a wall covering over the insulation must be structurally adequate to resist horizontal forces perpendicular to the wall. All walls must be braced in accordance with IBC Section 2308.9.3 or IRC Section R602.10.3, as applicable.

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Insulation boards must not be used as a nailing base for exterior siding materials. All nailing must penetrate through the insulation into the wall framing or structural sheathing as required by the siding manufacturer's instructions or the applicable code.

Use of insulation boards as roof insulation must be limited to installations recognized in a current ICC-ES evaluation report on Class A, B or C roof covering system.

4.2 Thermal Resistance (R-values):

4.2.1 Insulation R-values in Wall Assemblies: Overall R-values were determined for the following wall assemblies (horizontal heat flow) tested according to ASTM C 1363. The overall assembly tested measured 97¹/₂ inches by 97¹/₂ inches (2 476.5 by 2 476.5 mm).

4.2.2 R-value for Wall Assembly No. 1: Three-eighths-inch (9.52 mm) P-2000 RPR with metalized reflective film facings on both sides was installed on the inside between the outer edges of the studs and below the drywall. The assembly is a nominally 2-by-6-inch (50.8 by 152.4 mm) stud wall at 16 inches on center (406.4 mm) with a single bottom plate and a double top plate. The inside surface is ¹/₂-inch (12.7 mm) drywall and the exterior surface is ¹/₂-inch (12.7 mm) OSB. When tested with an inside temperature of 70°F (21°C) and an exterior temperature of -10°F (-23.5°C), and an exterior wind speed of 15 mph (6.6 m/s), the overall assembly (outside surface to inside surface) yielded an R-value of 5.25 Hr • ft² • °F/Btu (0.924 m² • K/W).

4.2.3 R-value for Wall Assembly No. 2: Five-eighths-inch (15.9 mm) P-2000 RPR with metalized reflective film facings on both sides was installed on the outside between the studs and the OSB. The assembly consists of a 2-by-6-inch (50.8 by 152.4 mm) stud wall at 16 inches on center (406.4 mm) with a single-bottom plate and a double-top plate. The inside surface is ¹/₂-inch (12.7-mm) drywall and the exterior surface is ¹/₂-inch (12.7 mm) OSB. When tested with an inside temperature of 70°F (21°C) and an exterior temperature of -10°F (-23.5°C), and an exterior wind speed of 15 mph (6.6 m/s), the overall assembly (outside surface to inside surface) yielded an R-value of 8.37 Hr • ft² • °F/Btu (1.473 m² • K/W).

4.2.4 R-value for Wall Assembly No. 3: One-inch (25.4 mm) P-2000 RPR with metalized reflective film facings on both sides was installed on the outside of the studs. Three-quarter-inch (19 mm) spacers were installed on the outside of the P-2000, then the OSB was applied. The assembly consists of a 2-by-6-inch (50.8 by 152.4 mm) stud wall at 16 inches on center (406.4 mm) with a single bottom plate and a double top plate. The inside surface is ¹/₂-inch (12.7 mm) drywall and the exterior surface is ¹/₂-inch (12.7 mm) OSB. When tested with an inside temperature of 70°F (21°C) and an exterior temperature of -10°F (-23.5°C), and an exterior wind speed of 15 mph (6.6 m/s) the overall assembly (outside surface to inside surface) yielded an overall R-value of 10.2 Hr • ft² • °F/Btu (1.795 m² • K/W).

5.0 CONDITIONS OF USE

The Proactive Technology, Inc., P-2000 RPR and WPR insulation boards 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 boards must be produced, identified and installed in accordance with this report, the manufacturer's published installation instructions and the applicable code. The installation instructions within this report must govern if there are any conflicts between the manufacturers's published installation instructions and this report.
- 5.2 The insulation board used in exterior wall applications must be covered with an approved exterior wall covering, including a water-resistive barrier complying with IBC Section 1404.2 or IRC Section R703.2, as applicable.
- 5.3 The insulation boards must be separated from the interior of the building by an approved 15-minute thermal barrier as required by IBC Section 2603.4 or IRC Section R314.4.
- 5.4 When the insulation boards are used in areas where the probability of termite infestation is "very heavy" and when foam plastic insulation is used with wood construction, the foam plastic must be installed in accordance with IBC Section 2603.8 or IRC Section R320.5, as applicable.
- 5.5 The insulation boards must not be used structurally to resist transverse, vertical or in-plane loads. Walls on which the insulation boards are applied must be braced in accordance with the applicable code.
- 5.6 The insulation board must not be used as a nailing base.
- 5.7 The insulation boards must be used only on buildings of Type V-B (combustible) construction or structures constructed in accordance with the IRC.
- 5.8 Proactive Technology, Inc., P-2000 RPR and WPR insulation boards are produced in Prospect, Connecticut, under a quality control program with inspections by ATI (AA-676).

6.0 EVIDENCE SUBMITTED

- 6.1 Data in accordance with the ICC-ES Acceptance Criteria for Foam Plastic Insulation (AC12), dated June 2009.
- 6.2 Data in accordance with ASTM C 1363, Standard Test Method for Thermal Performance of Building Materials and Envelope Assemblies by Means of a Hot Box Apparatus.

7.0 IDENTIFICATION

The Proactive Technology, Inc., P-2000 Insulation Systems RPR and WPR insulation boards described in this report are packaged in bundles bearing a label indicating the report holder's name (Proactive Technology, Inc.) and address, the product name (P-2000 RPR or P-2000 WPR), the name of the inspection agency (Architectural Testing Inc., AA-676), the density, the flame-spread and smoke-developed indices, the thermal-resistance R-value and the evaluation report number (ESR-2222). Individual boards are identified by a stamp bearing the report holder's name, the evaluation report number (ESR-2222) and the name of the inspection agency (Architectural Testing Inc., AA-676).