

ICC-ES Evaluation Report**ESR-3398**

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**DIVISION: 07 00 00—THERMAL AND MOISTURE
PROTECTION**
Section: 07 21 00—Thermal Insulation**REPORT HOLDER:****JOHNS MANVILLE**
717 17TH STREET
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www.jm.com**EVALUATION SUBJECT:****JOHNS MANVILLE APT™ FOIL-FACED SHEATHING****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)

Property evaluated:

- Surface-burning characteristics
- Thermal resistance
- Water vapor transmission
- Attic and crawl space installation
- Exterior walls in Types I through IV construction

2.0 USES

APT™ Foil-Faced Sheathing is used as nonstructural, thermal insulating material in Types I, II, III, IV and V construction (IBC) and dwellings under the IRC. The insulation boards may be used with a thermal barrier within or on interior or exterior walls and ceiling assemblies, and also in attics and crawl spaces with a thermal or ignition barrier. Additionally, the boards may be used at the perimeter of concrete slab on-grade and on the interior side of basement foundation walls.

The APT™ Foil-Faced Sheathing may be used on the exterior face of exterior walls of any type of construction. When used in exterior walls in Types I, II, III, and IV construction, construction must be in accordance with Section 4.3 of this report.

3.0 DESCRIPTION**3.1 APT™ Foil-Faced Sheathing:**

APT™ Foil-Faced Sheathing has a closed-cell, rigid polyisocyanurate foam plastic core, bonded on both sides with an aluminum foil and kraft paper laminate. The foam plastic core has a nominal density of 1.7 pcf (28.8 kg/m³). The boards have square edges and are available in various lengths and widths and in thicknesses between 1/2 inch and 4 inches (12.7 and 102 mm). The insulation boards are classified as Type I, Class 1 material in accordance with ASTM C1289.

3.2 Surface-burning Characteristics:

The foam core of APT™ Foil-Faced Sheathing has a flame-spread index of 25 or less and a smoke-developed index of 450 or less when tested in accordance with ASTM E84 at a maximum thickness of 4 inches (102 mm).

3.3 Thermal Resistance, R-values:

APT™ Foil-Faced Sheathing has thermal resistance (R-value) at a mean temperature of 75°F (24°C) as shown in Table 1.

3.4 Vapor Retarder:

At a minimum thickness of 1 inch (25.4 mm), the insulation boards have a vapor permeance of less than 0.1 perm [5.7×10^{-12} kg/ (Pa·s·m²)] when tested in accordance with ASTM E96 (desiccant method) (Procedure A), and qualify as a Class I vapor retarder.

4.0 INSTALLATION**4.1 General:**

APT™ Foil-Faced Sheathing must be installed in accordance with the Johns Manville published installation instructions, the applicable code and this report. The manufacturer's published installation instructions must be available on the jobsite at all times during installation.

At a maximum thickness of 4 inches (102 mm), APT™ Foil-Faced Sheathing may be used as nonstructural insulating material with a thermal barrier on any or all surfaces (wall or ceiling assembly) in any type of structure. For exterior wall applications, the insulation boards must be attached with fasteners spaced a maximum of 24 inches (610 mm) on center in the field and 16 inches (406 mm) on center on the perimeter. For interior applications, the insulation boards must be attached with fasteners spaced a maximum of 24 inches (610 mm) on center along the width of the board and a maximum of 48 inches (1219 mm) on center along the length of the board.

The wall covering must be structurally adequate to resist transverse loads. For exterior wall covering applications, fasteners for insulation board thicker than 1½ inches (38 mm) must be considered for lateral resistance to ensure support for the exterior wall coverings. All walls must be braced in accordance with IBC Sections 2308.9.3 and 2308.12.4 or IRC Section R602.10, as applicable.

4.2 Attics and Crawl Spaces:

When AP™ Foil-Faced Sheathing is installed within attics and crawl spaces, where entry is made only for service of utilities, an ignition barrier must be installed in accordance with IBC Section 2603.4.1.6 or IRC Section R316.5.3 or R316.5.4, as applicable. The ignition barrier must be consistent with the requirements for the type of construction required by the applicable code, and must be installed in such a manner that the foam plastic insulation is not exposed.

4.3 Exterior Walls of Types I, II, III and IV Construction:

4.3.1 General: When used on exterior walls of Type I, II, III and IV construction, the assembly must comply with Section 2603.5 of the IBC and this section (Section 4.3), and the insulation boards must be installed at a maximum thickness of 4 inches (102 mm). The potential heat of the AP™ Foil-Faced Sheathing insulation boards is 1677 Btu/ft² (19.0 MJ/m²) per inch of thickness when tested in accordance with NFPA 259.

4.3.2 Specific Wall Assemblies: Wall assemblies complying with Section 4.3 must be as described in Table 2.

5.0 CONDITIONS OF USE

The Johns Manville AP™ Foil-Faced Sheathing described in this report complies with, or is a suitable alternative to what is specified in, those codes listed in Section 1.0 of this report, subject to the following conditions:

- 5.1 Installation must comply with this report, the manufacturer's published installation instructions and the applicable code. In the event of a conflict between the manufacturer's published installation instructions and this report, this report governs.
- 5.2 Use of the insulation boards to resist structural loads is outside the scope of this report. The walls must be braced in accordance with the requirements of the applicable code.
- 5.3 The insulation boards must not be used as a nailing base for exterior siding materials. All nailing must be into the wall framing as required by the siding manufacturer's instructions or the applicable code.
- 5.4 Jobsite certification and labeling of the insulation must comply with 2012 IRC Section N1101.12 or 2009 IRC Section N1101.4; and 2012 IECC Section C303.1 or R303.3 or 2009 IECC Section 303.1, as applicable.

5.5 Use of insulation in areas where the probability of termite infestation is "very heavy" must be in accordance with 2012 IBC Section 2603.9, 2009 IBC Section 2603.8 or IRC Section R318.4, as applicable. In these areas, the insulation must not be installed on the exterior of the foundation walls or below floor slabs on grade or in contact with soil. Also, in these areas, there must be a clearance of at least 6 inches (152 mm) between the foam plastic insulation and exposed earth.

5.6 When the insulation boards are used on exterior walls of buildings of Type I, II, III or IV construction, installation must be as described in Section 4.3.

5.7 When the insulation boards are used in interior assemblies, the interior of the building must be separated from the insulation boards with an approved thermal barrier as required in IBC Section 2603.4 or IRC Section R316.4.

5.8 AP™ Foil-Faced Sheathing insulation boards are manufactured by Johns Manville in Bremen, Indiana; Cornwall, Ontario, Canada; Fernley, Nevada; Hazle Township, Pennsylvania, and Jacksonville, Florida, under a quality control program with inspections by Intertek Testing Services NA, Inc. (AA-690).

6.0 EVIDENCE SUBMITTED

- 6.1 Data in accordance with the ICC-ES Acceptance Criteria for Foam Plastic Insulation (AC12), dated June 2012.
- 6.2 Reports of potential heat tests in accordance with NFPA 259.
- 6.3 Reports of fire propagation characteristics testing in accordance with NFPA 285.
- 6.4 Engineering analysis addressing use of alternate exterior wall constructions in Types I, II, III, and IV construction based on NFPA 285 testing.

7.0 IDENTIFICATION

The AP™ Foil-Faced Sheathing insulation boards described in this report are identified by a label on the boards or on the packaging material bearing the manufacturer's name (Johns Manville), the plant code or address, the product name, the flame spread and smoke developed indices, the name of the inspection agency (Intertek Testing Services NA, Inc.), and the evaluation report number (ESR-3398); except for those products that are used in Type I, II, III and IV construction, which must always have the above-noted information printed on the boards themselves.

TABLE 1—THERMAL RESISTANCE (R-VALUES)

THICKNESS (INCHES)	R-VALUE [(°F-ft ² -hr)/BTU] at 75°F MEAN TEMPERATURE
1	6.5
1.5	9.6
2	13
3	19
4	25

For **SI**: 1 inch = 25.4 mm; 1°F-ft²-hr/BTU = 0.176 K-m²/W.

TABLE 2—NFPA 285 COMPLYING EXTERIOR WALL ASSEMBLIES IN TYPES I, II, III AND IV CONSTRUCTION FOR MAXIMUM 4.0-INCH-THICK JOHNS MANVILLE AP™ FOIL-FACED SHEATHING INSULATION BOARDS

Base wall system – Use either 1, 2 or 3	<ol style="list-style-type: none"> Concrete wall Concrete Masonry wall Steel Studs (Minimum 3⁵/₈ inch deep, minimum 25-gauge steel studs at a maximum of 24-inch on center) with 1 layer of 5/₈ inch-thick Type X gypsum wallboard (interior face).
Floorline Firestopping	4 lb/ft ³ mineral wool (e.g. Thermafiber) friction fit in each stud cavity and at each floorline.
Cavity Insulation – Use 1 or 2.	<ol style="list-style-type: none"> None Fiberglass batt insulation (faced or unfaced) complying with the applicable code.
Exterior sheathing – Use either 1, 2 or 3	<ol style="list-style-type: none"> None Minimum 1/2-inch-thick, exterior type gypsum sheathing complying with the applicable code. Minimum 5/₈-inch-thick, Type X exterior type gypsum sheathing complying with the applicable code.
Water-resistive Barrier Applied to Exterior Sheathing – Use 1, 2, 3, 4, 5, or 6	<ol style="list-style-type: none"> Perm-A-Barrier[®] VPS – W.R. Grace Tyvek[®] CommercialWrap[®] - DuPont (ESR-2375) Green Guard[®] Max Building Wrap – Pactive (ESR-2906) Weathermate[™] – Dow Chemical (ESR-2862) Weathermate[™] Plus – Dow Chemical (NER-640) Any water-resistive barrier that meets the applicable codes and has a current ICC-ES evaluation report for the intended use. <p>*Note: All barriers to be installed in accordance with manufacturer’s installation instructions, the applicable ICC-ES evaluation report and the applicable codes.</p>
Exterior Insulation	Johns Manville AP™ Foil-Faced Sheathing board. Maximum thickness to be 4 inches. Install AP™ Foil-Faced Sheathing board with offsetting joints or nonstaggered.
Exterior Wall Covering – Use either 1, 2, 3, 4, or 5	<ol style="list-style-type: none"> Brick. Use standard nominal 4-inch-thick, clay brick. Use standard brick veneer anchors installed vertically on each stud at a maximum of 24 inches o.c. creating a 1-inch maximum air gap between the exterior insulation and brick. Stucco¹. Minimum 3/₄-inch-thick, exterior cement plaster and lath. A secondary water-resistive barrier can be installed between the exterior insulation and the lath. The secondary water-resistive barrier shall not be full-coverage asphalt or butyl-based self-adhered membranes. Natural Stone Veneer. Minimum 2-inch-thick (granite, limestone, marble, sandstone) installed using any standard non-open joint installation technique, such as shiplap. Cast Artificial Stone complying with ICC-ES AC51, pre-cast concrete or concrete masonry unit (CMU) -- Minimum 1 1/2-inch-thick installed using any standard nonopen joint installation technique such as shiplap. Terracotta² Cladding -- Minimum 1 1/4-inch-thick installed using any standard non-open joint installation technique such as shiplap.

For **SI**: 1 inch = 25.4 mm.

¹Cladding fasteners must penetrate through the foam plastic into wood or steel framing and the system must be designed to handle cladding load and wind load, per applicable code.

²Fasteners used for securing the terracotta cladding must penetrate through the foam plastic into wood or steel framing and the system must be designed to handle cladding load and wind load, per applicable code.