

ICC-ES Evaluation Report


ESR-2350

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<p>DIVISION: 07 00 00— THERMAL AND MOISTURE PROTECTION</p> <p>Section: 07 21 00— Thermal Insulation</p>	<p>REPORT HOLDER: PRODUCTOS DE ESPUMA S.A.</p>	<p>EVALUATION SUBJECT: PRODEX ESD-5 REFLECTIVE INSULATION</p>	
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1.0 EVALUATION SCOPE

Compliance with the following codes:

- 2009 and 2006 [International Building Code® \(IBC\)](#)
- 2009 and 2006 [International Residential Code \(IRC\)](#)
- 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.

Properties evaluated:

- Thermal resistance
- Surface-burning characteristics

2.0 USES

Prodex® ESD-5 Reflective Insulation is used as insulation in roof assemblies in residential and commercial buildings.

3.0 DESCRIPTION

3.1 General:

Prodex ESD-5 Reflective Insulation is available in a nominal thickness of ¹³/₆₄ inch (5 mm) with a core of closed cell polyethylene foam plastic insulation and laminated on both sides with a layer of reinforced aluminum protected by a coating. The product is available in various nominal widths and lengths, perforated or nonperforated, and is also available with an optional adhesive strip applied to the long-dimension of the roll insulation.

3.2 Surface-burning characteristics:

Prodex ESD-5 Reflective Insulation 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.

3.3 Vapor Retarder:

The nonperforated insulation has a vapor permeance of less than 0.1 perm when tested in accordance with ASTM E96 (desiccant method) (Procedure A), and qualifies as a Class I vapor retarder.

The perforated insulation has a vapor permeance of less than 10 perm when tested in accordance with ASTM E96 (desiccant method) (Procedure A), and qualifies as a Class III vapor retarder.

4.0 INSTALLATION

4.1 General:

Prodex ESD-5 Reflective Insulation is installed as indicated in [Figure 1](#) in roof. All joints and any tears must be sealed with aluminum tape. Prodex ESD-5 may be installed without the thermal barrier required by IBC Section 2603.4 or IRC Section R316.4, as applicable.

4.2 Metal Roof Assembly:

Prodex ESD-5 Reflective Insulation may be installed within a metal roof assembly and in pole barn roofing applications when installed in accordance with [Figure 1](#) and this section. Metal straps are attached to the bottom of the purlins by screws. A vapor barrier is rolled out over the straps and attached with staples. This vapor barrier must be listed and labeled as having a flame spread index not greater than 25 and smoke developed index not greater than 450 in accordance with ASTM E84 or UL723. R-13 unfaced glass-fiber batt insulation is placed on top of the liner. A layer of Prodex ESD-5 Reflective Insulation is rolled out over the top of the purlins. Extruded polystyrene (XPS) thermal block spacers with a minimum *R*-value of *R*-5 and a 1-inch (25.4 mm) thickness are attached through the reflective insulation to the purlins. See [Table 1](#) for the *R*-values of the assembly and of the insulated region between the purlins.

5.0 CONDITIONS OF USE:

The Prodex ESD-5 Reflective Insulation 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 case of a conflict, the instructions in this report govern.
- 5.2 ESD-5 may be installed exposed to the interior of the building without a thermal barrier.
- 5.3 Evaluation of the reflective insulation and assembly for properties other than the *R*-values is outside the scope of this report.
- 5.4 Prodex ESD-5 Reflective Insulation is manufactured in Alajuela, Costa Rica, under a quality control program with inspections by ICC-ES.

6.0 EVIDENCE SUBMITTED

- 6.1 Data in accordance with [ICC-ES Acceptance Criteria for Reflective Insulation \(AC02\)](#), dated June 2011.
- 6.2 Data in accordance with the [ICC-ES Acceptance Criteria for Foam Plastic Insulation \(AC12\)](#), dated February 2011.
- 6.3 Report on room corner fire testing of ESD-5 in accordance with NFPA 286.

7.0 IDENTIFICATION

- 7.1 Each roll of the product must be labeled with the manufacturer's name (Productos de Espuma), product name (Prodex ESD-5), evaluation report number (ESR-2350), production order number, product dimensions, flame-spread and smoke-developed indices, and the wording "See ESR-2350 for the thermal resistance (*R*-value) of the assembly or assemblies".
- 7.2 The report holder's contact information is the following:

PRODUCTOS DE ESPUMA S.A.
APDO 330-4060 MALL INTERNACIONAL
ALAJUELA
COSTA RICA
(011) 506-2438-2322
www.prodexcr.com

TABLE 1—R-VALUES FOR PRODEX ESD-5⁵

CONFIGURATION ²	HEAT FLOW DIRECTION	R-VALUE ⁴ (hr·ft ² ·°F/Btu) (Assembly)	R-VALUE ¹ (hr·ft ² ·°F/Btu) (Insulated region between purlins)
Horizontal ³	Heat flow up	18.86	26.3
Horizontal ³	Heat flow down	21.85	31.7

For SI: 1 inch = 25.4 mm, 1 hr·ft²·°F/Btu = 0.176 m²·K/W.

¹R-values are according to ASTM C1224 for inside surface to inside surface of the test cavity and do not include the roof coverings, purlins or vapor barrier.

²Configuration of test assembly is as described in Section 4.2.

³Horizontal configuration: The purlins are oriented in the test chamber to form a horizontal cavity and the heat flow is vertical (up or down).

⁴R-values are according to ASTM C1363 for air-to-air values including air-film resistances on both sides of the test assembly. The values do not apply to the roof covering, purlins and vapor barrier.

⁵R-values in Table 1 can be used to contribute to the IECC's Building Envelope requirements.

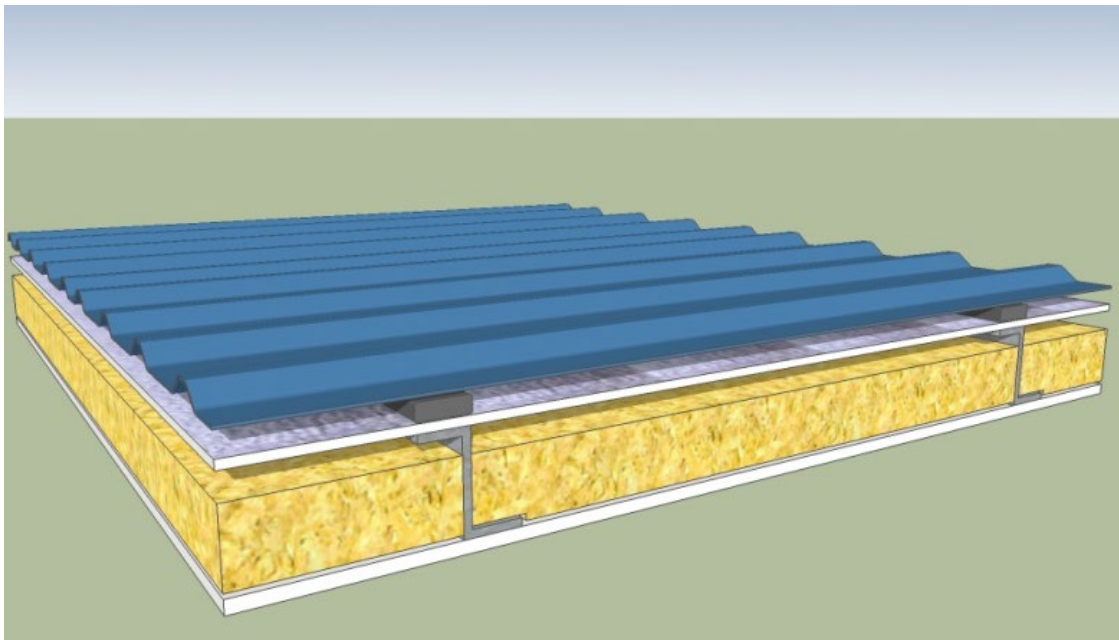
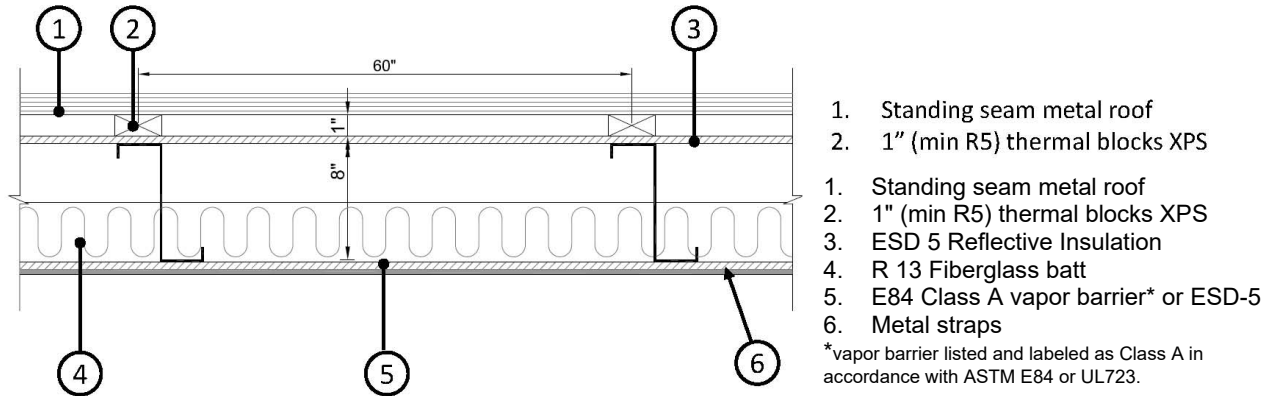


FIGURE 1—TYPICAL INSTALLATION OF PRODEX ESD-5 WITH METAL ROOF