



### DIVISION: 07 00 00—THERMAL AND MOISTURE PROTECTION

#### Section: 07 21 00—Thermal Insulation

#### REPORT HOLDER:

PRODUCTOS DE ESPUMA S.A.

#### EVALUATION SUBJECT:

#### PRODEX ESD-5 REFLECTIVE INSULATION

### 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)<sup>†</sup>

<sup>†</sup>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  $1\frac{3}{64}$  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](http://www.prodexcr.com)

TABLE 1—*R*-VALUES FOR PRODEX ESD-5<sup>5</sup>

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

For SI: 1 inch = 25.4 mm, 1 hr·ft<sup>2</sup>·°F/Btu = 0.176 m<sup>2</sup>·K/W.

<sup>1</sup>*R*-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.

<sup>2</sup>Configuration of test assembly is as described in Section 4.2.

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

<sup>4</sup>*R*-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.

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

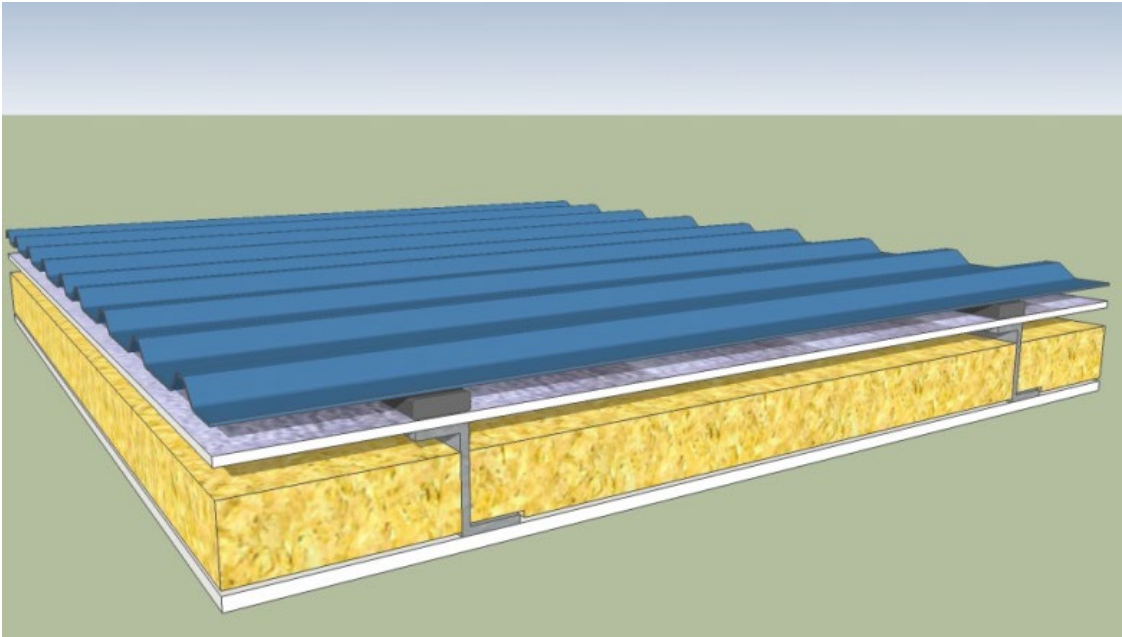
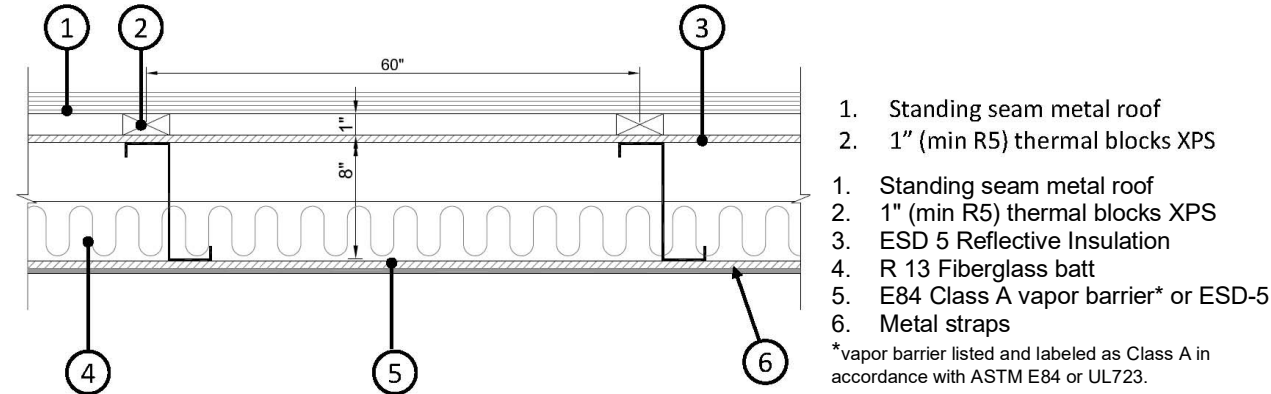


FIGURE 1—TYPICAL INSTALLATION OF PRODEX ESD-5 WITH METAL ROOF