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)
- 2013 Abu Dhabi International Building Code (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>
<thead>
<tr>
<th>CONFIGURATION²</th>
<th>HEAT FLOW DIRECTION</th>
<th>R-VALUE¹ (hr•ft²•°F/Btu) (Assembly)</th>
<th>R-VALUE¹ (hr•ft²•°F/Btu) (Insulated region between purlins)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Horizontal³</td>
<td>Heat flow up</td>
<td>18.86</td>
<td>26.3</td>
</tr>
<tr>
<td>Horizontal³</td>
<td>Heat flow down</td>
<td>21.85</td>
<td>31.7</td>
</tr>
</tbody>
</table>

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.

1. Standing seam metal roof
2. 1” (min R5) thermal blocks XPS
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2. 1” (min R5) thermal blocks XPS
3. ESD 5 Reflective Insulation
4. R 13 Fiberglass batt
5. E84 Class A vapor barrier* or ESD-5
6. Metal straps

* Vapor barrier listed and labeled as Class A in accordance with ASTM E84 or UL723.