

ICC-ES Evaluation Report

ESR-5453


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Subject to renewal January 2025

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<p>DIVISION: 07 00 00 — THERMAL AND MOISTURE PROTECTION</p> <p>Section: 07 21 00 — Thermal Insulation</p> <p>Section: 07 22 00 — Roof and Deck Insulation</p>	<p>REPORT HOLDER:</p> <p>DREXEL METALS</p>	<p>EVALUATION SUBJECT:</p> <p>ROOF INSULATION: DEFEND-R, DEFEND-R COATED GLASS, AND DEFEND-R NAIL BASE</p>	
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1.0 EVALUATION SCOPE

Compliance with the following codes:

- 2024, 2021, 2018, 2015, 2012 and 2009 [International Building Code® \(IBC\)](#)
- 2024, 2021, 2018, 2015, 2012 and 2009 [International Residential Code® \(IRC\)](#)
- 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:

- Surface-burning characteristics
- Physical properties
- Elimination of the thermal barrier when application is directly to steel roof decks

2.0 USES

Drexel Metals Defend-R, Defend-R Coated Glass and Defend-R Nail Base, roofing insulation panels are used as above-deck roof insulation, as a component of a Class A, B, or C roof covering.

3.0 DESCRIPTION

3.1 General:

Defend-R, Defend-R Coated Glass and Defend-R Nail Base, insulation panels are rigid insulation panels with a closed-cell polyisocyanurate foam core. The foam core has a flame-spread index of 75 or less and a smoke-developed index of 450 or less when tested in accordance with ASTM E84 or UL 723 at a maximum thickness of 4.5 inches (115 mm) and a maximum density of 2 pounds per cubic foot (32 kg/m³).

3.2 Materials:

3.2.1 Defend-R: The foam plastic core is faced on each side with a fiber-reinforced facer. It is produced in panels measuring 4 feet by 4 feet (1220 mm by 1220 mm) and 4 feet by 8 feet (1220 mm by 2440 mm) and having thicknesses from 1 inch (25 mm) to 4.5 inches (115 mm). Defend-R is classified as Type II Class 1 in accordance with ASTM C1289.

3.2.2 Defend-R Coated Glass: The foam plastic core is faced with a coated glass facer on each side. It is produced in panels measuring 4 feet by 4 feet (1220 mm by 1220 mm) and 4 feet by 8 feet (1220 mm by 2440 mm) and having thicknesses from 1 inch (25 mm) to 4.5 inches (115mm). Defend-R Coated Glass is classified as Type II Class 2 in accordance with ASTM C1289.

3.2.3 Defend-R Nail Base: The foam plastic core is faced with a fiber-reinforced facer on one side and $7/16$ -inch (11.1 mm) or $5/8$ -inch (15.9 mm) oriented strand board (OSB), or $3/4$ -inch (19.0 mm) or $5/8$ -inch (15.9 mm) plywood, on the other. It is produced in panels measuring a nominal 4 feet by 8 feet (1220 mm by 2440 mm) and having thicknesses from 1.5 inches (38 mm) to 4.5 inches (115 mm). Defend-R Nail Base is classified as Type V in accordance with ASTM C1289.

4.0 DESIGN AND INSTALLATION

4.1 General:

Drexel Metals insulation panels must be installed in accordance with the manufacturer's published installation instructions and this report. The manufacturer's published installation instructions and this report must be strictly adhered to, and a copy of the instructions must be available on the jobsite during installation.

4.2 Installation:

When installed as above-deck roof insulation as a component of a Class A, B or C roof covering, the Defend-R, Defend-R Coated Glass, and Defend-R Nail Base roofing insulations comply with IBC Sections 1508.2 and 2603.4.1.5 and 2024 IRC Sections R303.5.2. and R906 (2021, 2018, 2015, 2012 and 2009 IRC Sections R316.5.2 and R906). Defend-R Nail Base must be installed, respectively, with the wood structural panel side and the fiberboard side up.

Defend-R, Defend-R Coated Glass and Defend-R Nail Base roofing insulation panels may be installed as a component of a Class A, B, or C roof covering, when identified either by product name or generically (ASTM C1289) in a classified roof assembly that is specified in an ICC-ES evaluation report for roof coverings or as listed by an approved testing agency.

The insulation panels may be installed on steel decks without a thermal barrier provided installation is in accordance with the classified roof covering and the following: Minimum No. 22 MSG gauge steel decking, with a minimum fluted depth of $1\frac{1}{2}$ inches (38 mm) and no perforations, is welded or mechanically fastened to the supports in accordance with the approved plans. Defend-R, Defend-R Coated Glass and Defend-R Nail Base is attached to the deck with steep asphalt at a rate of 12 to 15 pounds per 100 square feet (0.6 to 0.7 kg/m²), or with mechanical fasteners. The roof covering must be a Class A, B or C roof assembly in accordance with IBC Section 1505.1 or IRC Section R902.1, as applicable.

5.0 CONDITIONS OF USE

The Drexel Metals insulation panels 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** 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** The insulation boards must be separated from the interior of the building by an approved thermal barrier in accordance with IBC Section 2603.4 or 2024 IRC Section 303.4. (2021, 2018, 2015, 2012 and 2009 IRC Section R316.4), as applicable, except as described in Section 4.2 of this report.
- 5.3** When use is in a roof covering assembly required to have a Class A, B, or C roof covering classification, the Class A, B, or C roofing assembly must specify a polyisocyanurate foam plastic insulation having characteristics consistent with the Drexel Metals products.
- 5.4** Evaluation of Defend-R, Defend-R Coated Glass, and Defend-R Nail Base roofing insulation panels for resistance to wind uplift loads is outside the scope of this report.
- 5.5** Drexel Metals insulation panels are manufactured in Montgomery, New York; Franklin Park, Illinois; Tooele, Utah; Lake City, Florida; Smithfield, Pennsylvania; Terrell, Texas; and Puyallup, Washington, under a quality control program with inspections by ICC-ES.

6.0 EVIDENCE SUBMITTED

- 6.1 Data in accordance with the [ICC-ES Acceptance Criteria for Foam Plastic Insulation \(AC12\)](#), dated June 2015 (editorially revised June 2024).
- 6.2 Reports of tests in accordance with UL 1256.

7.0 IDENTIFICATION

- 7.1 The ICC-ES mark of conformity, electronic labeling, or the evaluation report number (ICC-ES ESR-5453) along with the name, registered trademark, or registered logo of the report holder (Drexel Metals) must be included in the product label.
- 7.2 In addition, Defend-R, Defend-R Coated Glass and Defend-R Nail Base insulation products or packaging are marked with the manufacturer's name (Drexel Metals); the product name; the manufacturing facility location; the telephone number; the lot number; the date of manufacture; and the evaluation report number (ESR-5453).
- 7.3 The report holder's contact information is the following:

DREXEL METALS
1234 GARDINER LANE
LOUISVILLE, KENTUCKY 40213
(833) 714-1198
www.drexmet.com