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# ICC-ES Evaluation Report

# ESR-2932

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Reissued 05/2017  
This report is subject to renewal 05/2019.

**DIVISION: 07 00 00—THERMAL AND MOISTURE PROTECTION**  
**SECTION: 07 25 00—WATER-RESISTIVE BARRIERS/WEATHER BARRIERS**  
**SECTION: 07 27 00—AIR BARRIERS**

**REPORT HOLDER:**

**DORKEN SYSTEMS INC.**

**4655 DELTA WAY  
BEAMSVILLE, ONTARIO, L0R 1B4  
CANADA**

**EVALUATION SUBJECT:**

**DELTA® WATER RESISTIVE BARRIERS: DELTA®-MAXX, DELTA®-MAXX PLUS,  
DELTA®-FOXX, DELTA®-FOXX PLUS, DELTA®-VENT S, DELTA®-VENT S PLUS,  
DELTA®-VENT SA, DELTA®-FASSADE S AND DELTA®-FASSADE S PLUS**



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

**Section: 07 25 00—Water-Resistive Barriers/Weather Barriers**

**Section: 07 27 00—Air Barriers**

**REPORT HOLDER:**

**DORKEN SYSTEMS INC.**  
4655 DELTA WAY  
BEAMSVILLE, ONTARIO L0R 1B4  
CANADA  
(905) 563-3255  
[www.dorken.com](http://www.dorken.com)  
[info@dorken.com](mailto:info@dorken.com)

**EVALUATION SUBJECT:**

**DELTA® WATER RESISTIVE BARRIERS: DELTA®-MAXX, DELTA®-MAXX PLUS, DELTA®-FOXX, DELTA®-FOXX PLUS, DELTA®-VENT S, DELTA®-VENT S PLUS, DELTA®-VENT SA, DELTA®-FASSADE S AND DELTA®-FASSADE S PLUS**

**1.0 EVALUATION SCOPE**

**1.1 Compliance with the following codes:**

- 2015, 2012, 2009 and 2006 *International Building Code*® (IBC)
- 2015, 2012, 2009 and 2006 *International Residential Code*® (IRC)
- 2015, 2012, 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:**

- Water resistance
- Air leakage (DELTA®-MAXX, DELTA®-MAXX PLUS, DELTA®-VENT S, DELTA®-VENT S PLUS and DELTA®-VENT SA only)
- Surface-burning characteristics

**1.2 Evaluation to the following green code(s) and/or standards:**

- 2016 California Green Building Standards Code (CALGreen), Title 24, Part 11
- 2015 and 2012 *International Green Construction Code*® (IgCC)

- 2014 and 2011 ANSI/ASHRAE/USGBC/IES Standard 189.1—Standard for the Design of High-Performance Green Buildings, Except Low-Rise Residential Buildings
- 2015, 2012 and 2008 ICC 700 *National Green Building Standard*™ (ICC 700-2015, ICC 700-2012 and ICC 700-2008)

**Attributes verified:**

- See Section 2.0

**2.0 USES**

The DELTA® water-resistive barrier products recognized in this report are used as water-resistive barriers on the exterior side of exterior walls of buildings. The DELTA® water-resistive barrier products listed in this report may be used in buildings of any construction type under the IBC and construction permitted under the IRC. Under the 2015 IBC, DELTA® water-resistive barrier products may be used on buildings of Type I, II, III and IV construction that are not greater than 40 feet (12.2 m) in height above grade in accordance with 2015 IBC Section 1403.5, except as permitted in Exception 1 of Section 1403.5 of the 2015 IBC. Under the 2012 IBC, DELTA® water-resistive barrier products may be used on buildings of Type I, II, III and IV construction that are not greater than 40 feet (12.2 m) in height above grade in accordance with 2012 IBC Section 1403.5.

DELTA®-MAXX, DELTA®-MAXX PLUS, DELTA®-VENT S, DELTA®-VENT S PLUS and DELTA®-VENT SA are equivalent to 60-minute Grade D paper as described in the exception to 2012, 2009 and 2006 IBC Section 2510.6 and the exception to 2012, 2009 and 2006 IRC Section R703.6.3. DELTA®-FOXX, DELTA®-FOXX PLUS, DELTA®-VENT S PLUS, DELTA®-FASSADE S and DELTA®-FASSADE S PLUS are equivalent to Grade D paper as described in 2012, 2009 and 2006 IBC Section 2510.6 and 2015 IRC Section R703.7.3 [2012, 2009 and 2006 IRC Section R703.6.3]. DELTA®-MAXX, DELTA®-MAXX PLUS, DELTA®-VENT S and DELTA®-VENT S PLUS and DELTA®-VENT SA may also be used as air barrier materials under IRC Section N1102.4.1 and 2015 IECC Sections C402.5 and R402.4 [2012 IECC Section C402.4 and R402.4 (2009 and 2006 IECC Sections 402.4 and 502.4)].

The attributes of the DELTA®-MAXX, DELTA®-MAXX PLUS, DELTA®-VENT S and DELTA®-VENT S PLUS and DELTA®-VENT SA used as air barrier materials have been verified as conforming to the provisions of (i) CALGreen Section A4.407.5 for air barriers; (ii) 2012 and 2015 IgCC Section 605.1.2.1 for air barriers; and (iii) 2014 ASHRAE

189.1 Section 7.3.1.1 and 2011 ASHRAE 189.1 Section 7.4.2.9 for air barriers.

The attributes of the DELTA<sup>®</sup> water-resistive barrier products have been verified as conforming to the provisions of (i) CALGreen Section 5.407.1 for water-resistive barriers; (ii) ICC 700-2015 Section 602.1.8, 11.602.1.8 and 12.6.602.1.8; (iii) ICC 700-2012 Section 602.1.8, 11.602.1.8 and 12.5.602.1.8; and (iv) ICC 700-2008 Section 602.9 for water-resistive barriers.

Note that decisions on compliance for those areas rest with the user of this report. The user is advised of the project-specific provisions that may be contingent upon meeting specific conditions, and the verification of those conditions is outside the scope of this report. These codes or standards often provide supplemental information as guidance.

### 3.0 DESCRIPTION

#### 3.1 DELTA<sup>®</sup>-MAXX and DELTA<sup>®</sup>-MAXX PLUS:

DELTA<sup>®</sup>-MAXX and DELTA<sup>®</sup>-MAXX PLUS consist of a polyester, nonwoven, needle-punched layer, coated on one side with a polyurethane film, except that the DELTA<sup>®</sup>-MAXX PLUS includes a self-adhesive strip to aid in the installation of the water-resistive barrier. The self-adhesive strip does not replace mechanical fasteners used to attach the water-resistive barrier as required by the code. The product has a nominal weight of 3.7 pounds per 100 square feet (182 g/m<sup>2</sup>) and is produced in rolls 4.9 feet (1.5 m) wide and 164 feet (50 m) long. DELTA<sup>®</sup>-MAXX and DELTA<sup>®</sup>-MAXX PLUS have a flame spread index of less than 25 and a smoke-developed index of less than 450, when tested in accordance with ASTM E84. The product has an air leakage rate not exceeding 0.02 L/s-m<sup>2</sup> at 75 Pa [0.004 cfm/ft<sup>2</sup> at 0.3 inch w.g. (1.57 psf)] when used as an air barrier material under IRC Section N1102.4.1 and 2015 IECC Sections C402.5 and R402.4 [2012 IECC Section C402.4 and R402.4 (2009 and 2006 IECC Sections 402.4 and 502.4)].

#### 3.2 DELTA<sup>®</sup>-FOXX and DELTA<sup>®</sup>-FOXX PLUS:

DELTA<sup>®</sup>-FOXX and DELTA<sup>®</sup>-FOXX PLUS consist of a layer of nonwoven, thermo-bonded polyester coated on one side with an acrylic coating, except that the DELTA<sup>®</sup>-FOXX PLUS includes a self-adhesive strip to aid in the installation of the water-resistive barrier. The self-adhesive strip does not replace mechanical fasteners used to attach the water-resistive barrier as required by the code. The product has a nominal weight of 5.5 pounds per 100 square feet (270 g/m<sup>2</sup>) and is produced in rolls 4.9 feet (1.5 m) wide and 164 feet (50 m) long. DELTA<sup>®</sup>-FOXX and DELTA<sup>®</sup>-FOXX PLUS have a flame spread index of less than 25 and a smoke-developed index of less than 450, when tested in accordance with ASTM E84 (UL 723).

#### 3.3 DELTA<sup>®</sup>-VENT S and DELTA<sup>®</sup>-VENT S PLUS:

DELTA<sup>®</sup>-VENT S and DELTA<sup>®</sup>-VENT S PLUS consist of polypropylene spun fiber (nonwoven) inner and outer layers and a polypropylene film center layer, except that the DELTA<sup>®</sup>-VENT S PLUS includes a self-adhesive strip to aid in the installation of the water-resistive barrier. The self-adhesive strip does not replace mechanical fasteners used to attach the water-resistive barrier as required by the code. The product has a nominal weight of 2.9 pounds per 100 square feet (140 g/m<sup>2</sup>) and is produced in rolls 4.9 feet (1.5 m) wide and 164 feet (50 m) long. DELTA<sup>®</sup>-VENT S and DELTA<sup>®</sup>-VENT S PLUS have a flame spread index of less than 25 and a smoke-developed index of less than 450, when tested in accordance with ASTM E84 (UL 723). The product has an air leakage rate not exceeding 0.02 L/s-m<sup>2</sup> at 75 Pa [0.004 cfm/ft<sup>2</sup> at 0.3 inch w.g.

(1.57 psf)] when used as an air barrier material under IRC Section N1102.4.1 and 2015 IECC Sections C402.5 and R402.4 [2012 IECC Sections C402.4 and R402.4 (2009 and 2006 IECC Sections 402.4 and 502.4)].

#### 3.4 DELTA<sup>®</sup>-FASSADE S and DELTA<sup>®</sup>-FASSADE S PLUS:

DELTA<sup>®</sup>-FASSADE S and DELTA<sup>®</sup>-FASSADE S PLUS consist of a layer of nonwoven, thermo-bonded polyester coated on one side with an acrylic coating, except that the DELTA<sup>®</sup>-FASSADE S PLUS includes a self-adhesive strip to aid in the installation of the water-resistive barrier. The self-adhesive strip does not replace mechanical fasteners used to attach the water-resistive barrier as required by the code. The product has a nominal weight of 5.5 pounds per 100 square feet (270 g/m<sup>2</sup>). The product is produced in rolls 4.9 feet (1.5 m) wide and 164 feet (50 m) long. DELTA<sup>®</sup>-FASSADE S and DELTA<sup>®</sup>-FASSADE S PLUS have a flame spread index of less than 25 and a smoke-developed index of less than 450, when tested in accordance with ASTM E84 (UL 723).

#### 3.5 DELTA<sup>®</sup>-VENT SA:

DELTA<sup>®</sup>-VENT SA is a three-layer, self-adhered water-resistive barrier (WRB) and air barrier. Fasteners are not required. The two outer layers are spun-bonded polypropylene (PP) fabrics that are thermally bonded to a vapor-permeable, watertight, polymeric middle layer. The adhesive is applied to the bottom layer of spun-bonded polypropylene. DELTA<sup>®</sup>-VENT SA has an edge running along the front side of one long edge with a release liner that, when removed, exposes the adhesive. The product has a nominal weight of 7.3 oz/lyd<sup>2</sup> (247 g/m<sup>2</sup>) and is produced in rolls 4 feet 11 inches (1.5 m) wide and 115 feet (35 m) long. The product has an air leakage rate not exceeding 0.02 L/s-m<sup>2</sup> at 75 Pa [0.004 cfm/ft<sup>2</sup> at 0.3 inch w.g. (1.57 psf)] when used as an air barrier material under IRC Section N1102.4.1 and 2015 IECC Sections C402.5 and R402.4 [2012 IECC Sections C402.4 and R402.4 (2009 and 2006 IECC Sections 402.4 and 502.4)]. DELTA<sup>®</sup>-VENT SA has a flame spread index of less than 25 and a smoke-developed index of less than 450, when tested in accordance with ASTM E84 (UL 723).

### 4.0 INSTALLATION

#### 4.1 General:

The report holder's published installation instructions and this report must be strictly adhered to. If requested by the code official, a copy of this report must be available at the jobsite during installation.

#### 4.2 Water-resistive Barrier Mechanically Attached:

When installed as water-resistive barriers, the products described in this report are installed after wall framing is completed. The roll is placed approximately 1 foot (305 mm) from the starting corner and fastened to the sheathing with corrosion-resistant staples, large-headed nails, or roofing nails spaced at a maximum of 32 inches (812 mm) on center; and is then unrolled around the building and fastened, as set forth in the report holder's published installation instructions, at top and bottom sill plates and at framing members. A minimum of 6 inches (152 mm) of overlap is required for vertical seams and 2 inches (50.8 mm) for horizontal seams, except where the report holder's installation instructions specify a greater overlap dimension. When used over wood-based sheathing in exterior plaster applications, one layer of DELTA<sup>®</sup>-MAXX or DELTA<sup>®</sup>-MAXX PLUS or two layers of DELTA<sup>®</sup>-FOXX, DELTA<sup>®</sup>-FOXX PLUS, DELTA<sup>®</sup>-VENT S, DELTA<sup>®</sup>-VENT S PLUS, DELTA<sup>®</sup>-FASSADE S or DELTA<sup>®</sup>-FASSADE S PLUS must be applied over the

sheathing in accordance with 2012, 2009 and 2006 IBC Section 2510.6 or 2015 IRC Section R703.7.3 [2012, 2009 and 2006 IRC Section R703.6.3], as applicable. For cementitious coatings or exterior insulation and finish systems, application of the barrier must be in accordance with the evaluation report on the exterior coating.

#### **4.3 Water-resistive Barrier DELTA<sup>®</sup>-VENT SA Self-adhered:**

Prior to installation of the membrane, the substrate surface must be sound, dry, clean, and free of oil, grease, dirt, excess mortar, loose nails and other protrusions, and other contaminants that would be detrimental to adhesion of the membrane. The membrane must be installed only when the ambient air and substrate temperatures are at least 40°F (5°C). When installed as a water-resistive barrier, the membrane must be installed over the exterior face of the exterior wall sheathing that is attached to wall framing, and must be installed in a consecutive shingled fashion. The membrane roll must be placed at the starting wall corner and then unrolled around the building. A minimum of 6 inches (150 mm) of overlap must be provided for vertical seams, and a minimum of 4 inches (100 mm) of overlap for horizontal seams. When use is over wood-based sheathing in exterior plaster applications, installation must be in accordance with 2012, 2009 and 2006 IBC Section 2510.6 or 2015 IRC Section R703.7.3 [2012, 2009 and 2006 IRC Section R703.6.3]. For cementitious coatings or exterior insulation and finish systems, use of the membrane must be in accordance with a current ICC-ES evaluation report on the exterior coating.

#### **4.4 Air Barrier Material:**

When used as an air barrier, the DELTA<sup>®</sup>-MAXX, DELTA<sup>®</sup>-MAXX PLUS, DELTA<sup>®</sup>-VENT S, DELTA<sup>®</sup>-VENT S PLUS and DELTA<sup>®</sup>-VENT SA materials must be installed in accordance with the Dorken Systems Inc., installation instructions and this report.

### **5.0 CONDITIONS OF USE**

The products 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** The products must be installed in accordance with the report holder's published installation instructions, the requirements of the applicable code and this report. In the event of a conflict between this report and the published installation instructions, this report governs.

**5.2** The products must be covered by an exterior wall finish complying with the requirements of the applicable code.

**5.3** The air leakage rates noted in Section 3.1 for DELTA<sup>®</sup>-MAXX and DELTA<sup>®</sup>-MAXX PLUS, Section 3.3 for DELTA<sup>®</sup>-VENT S and DELTA<sup>®</sup>-VENT S PLUS, and Section 3.5 for DELTA<sup>®</sup>-VENT SA, are for the products' use as air barrier materials only. The design and evaluation of the air barrier assembly, of which the products are a component, is outside the scope of this report.

**5.4** Under the 2015 IBC, DELTA<sup>®</sup> water-resistive barrier products may be used on buildings of Type I, II, III and IV construction that are not greater than 40 feet (12.2 m) in height above grade in accordance with 2015 IBC Section 1403.5, except as permitted in Exception 1 of Section 1403.5 of the 2015 IBC. Under the 2012 IBC, DELTA<sup>®</sup> water-resistive barrier products may be used on buildings of Type I, II, III and IV construction that are not greater than 40 feet (12.2 m) in height above grade in accordance with 2012 IBC Section 1403.5.

### **6.0 EVIDENCE SUBMITTED**

**6.1** Data in accordance with the ICC-ES Acceptance Criteria for Water-resistive Barriers (AC38), August 2016

**6.2** Reports of surface burning characteristics testing in accordance with ASTM E84 (UL 723).

**6.3** Reports of air leakage testing in accordance with ASTM E2178 (DELTA<sup>®</sup>-MAXX, DELTA<sup>®</sup>-MAXX PLUS, DELTA<sup>®</sup>-VENT S, DELTA<sup>®</sup>-VENT S PLUS, and DELTA<sup>®</sup>-VENT SA only).

### **7.0 IDENTIFICATION**

The products described in this report are identified by a label on the container of each roll of membrane, and by printing on the product, that includes the report holder's name (Dorken Systems Inc.), the city and country of manufacture (Herdecke, Germany), the product name, the date of manufacture and the evaluation report number (ESR-2932).