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# ICC-ES Evaluation Report

# ESR-2743

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Reissued 06/2019  
This report is subject to renewal 06/2020.

**DIVISION: 09 00 00—FINISHES**  
**SECTION: 09 29 00—GYPSUM BOARD**

**REPORT HOLDER:**

**NATIONAL GYPSUM COMPANY**

**EVALUATION SUBJECT:**

**GOLD BOND BRAND® E<sup>2</sup>XP®, 1/2-INCH AND 5/8-INCH TYPE X,  
EXTENDED EXPOSURE GYPSUM SHEATHING**



*“2014 Recipient of Prestigious Western States Seismic Policy Council (WSSPC) Award in Excellence”*



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A Subsidiary of the International Code Council®

**DIVISION: 09 00 00—FINISHES**  
**Section: 09 29 00—Gypsum Board**

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**NATIONAL GYPSUM COMPANY**

**EVALUATION SUBJECT:**

**GOLD BOND BRAND® e<sup>2</sup>XP® 1/2-INCH AND 5/8-INCH TYPE X, EXTENDED EXPOSURE GYPSUM SHEATHING**

**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)<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:**

- Structural
- Noncombustibility
- Surface-burning characteristics
- Fire-resistance-rated construction
- Physical properties

**2.0 USES**

e<sup>2</sup>XP Extended Exposure Sheathing is used as gypsum sheathing and as exterior gypsum soffit board complying with the appropriate standard in Table 2506.2 of the IBC and Section R702.3.1 of the IRC. The sheathing is used as a single- or multiple-ply backing for exterior wall covering materials on buildings of all construction types under the IBC and buildings under the IRC. The sheathing may be used to resist transverse wind loads when installed in accordance with Section 4.2.1 and racking loads due to wind and seismic forces when installed in accordance with Section 4.2.2. The 5/8-inch-thick e<sup>2</sup>XP Type X Extended Exposure Sheathing may be used as a component of a fire-resistance-rated wall assembly when installed in accordance with Section 4.4.

**3.0 DESCRIPTION**

e<sup>2</sup>XP Extended Exposure Sheathing is a noncombustible, coated, glass-fiber-mat-faced, water-resistant-core gypsum sheathing which conforms to the physical property requirements of ASTM C1177, and the physical property requirements for exterior gypsum soffit board and treated core gypsum sheathing board in ASTM C1396. The sheathing is available in two varieties: 1/2-inch-thick (12.7 mm) e<sup>2</sup>XP Extended Exposure Sheathing and 5/8-

inch-thick (15.9 mm) e<sup>2</sup>XP, Type X, Extended Exposure Sheathing. The sheathing is 48 inches (1219 mm) wide and is available in various lengths.

e<sup>2</sup>XP Extended Exposure Sheathing is classified as noncombustible in accordance with ASTM E136, and exhibits a flame-spread index of 25 or less, and a smoke-developed index of 450 or less, in accordance with ASTM E84.

**4.0 DESIGN AND INSTALLATION**

**4.1 Installation:**

e<sup>2</sup>XP Extended Exposure Sheathing must be installed in accordance with the manufacturer's published installation recommendations, this report, and ASTM C1280 for IBC applications or IRC Section R702.3.5 for IRC applications. e<sup>2</sup>XP Extended Exposure Sheathing must be kept dry and stored off the ground under a protective covering prior to installation. The sheathing may be installed vertically or horizontally, except as noted in Sections 4.2.2 and 4.4 of this report, and must be fastened to framing in accordance with the applicable code. All fasteners used to attach the sheathing to structural framing must be driven so that the heads are at, or slightly below, the surface of the sheathing without fracturing the core. Once installed, the sheathing must be covered with an approved water-resistive barrier where required by the code, and an exterior wall covering. Exterior wall coverings may be adhered to e<sup>2</sup>XP Extended Exposure Sheathing when approved by the code official.

**4.2 Design:**

e<sup>2</sup>XP Extended Exposure Sheathing and e<sup>2</sup>XP Type X Extended Exposure Sheathing may be used to resist transverse wind loads when installed as described in Section 4.2.1. Design wind loads must be determined in accordance with Section 1609 of the IBC. The design wind loads must not exceed the allowable transverse wind loads shown in Section 4.2.1 of this report.

e<sup>2</sup>XP Extended Exposure Sheathing and e<sup>2</sup>XP Type X Extended Exposure Sheathing may be used as components of conventional light framed walls for resisting shear loads when installed as described in Section 4.2.2.

**4.2.1 Steel Stud Curtain Wall:** For an allowable positive and negative transverse wind load pressure of 21.6 psf (1.03 kN/m<sup>2</sup>), e<sup>2</sup>XP Extended Exposure Sheathing is fastened to minimum 3<sup>5</sup>/<sub>8</sub>-inch-deep, 1<sup>1</sup>/<sub>4</sub>-inch-flange, 33 ksi steel, 20 gage C-studs. Wall framing must be designed in accordance with the applicable code, and the stud spacing must not exceed 16 inches (406 mm) for 1/2-inch-thick e<sup>2</sup>XP sheathing, or 24 inches (609 mm) for 5/8-inch-thick e<sup>2</sup>XP sheathing. Sheathing fasteners must be minimum 1<sup>1</sup>/<sub>4</sub>-inch-long (25.4 mm), No. 6, bugle-head, self-drilling, corrosion-resistant tapping screws complying with

ASTM C1002, spaced at 4 inches (102 mm) on center along the edges and at 8 inches (203 mm) on center along intermediate supports. The screws must be installed at a minimum edge distance of  $\frac{3}{8}$  inch (9.5 mm).

#### 4.2.2 Shear Resistance:

**4.2.2.1 Prescriptive Wall Bracing:** e<sup>2</sup>XP Extended Exposure glass mat substrate is equivalent to gypsum sheathing for use as bracing to resist lateral loads due to wind and seismic forces. When installed as prescribed by IBC or IRC for gypsum sheathing, the glass mat gypsum substrate may be used as wall bracing in accordance with IBC Section 2308.9.3, Method 5, subject to the limitations in Section 2308.2, or in accordance with Section R602.10.2, Method GB of the 2009 IRC or Section R602.10.3, Method 5 of the 2006 IRC, as applicable.

**4.2.2.2 Engineered Shear Walls:** e<sup>2</sup>XP Extended Exposure glass mat substrate may be used as a component of engineered shearwalls when designed in accordance with IBC Section 2305 for wood framed walls or IBC Section 2210.6 for light steel framed walls. The allowable design wind and seismic values must not exceed the allowable racking shear capacity for gypsum sheathing shown in Table 2306.7 of the 2009 IBC or Table 2306.4.5 of the 2006 IBC. Design wind loads must be determined in accordance with Section 1609 of the IBC. Design seismic loads must be determined in accordance with Section 1613 of the IBC.

For seismic design, the substrate may be used as a component of wood-framed engineered shear walls for resisting seismic loads in Seismic Design Categories A, B, C, and D. The response modification factor,  $R$ , must be equal to 2; the system overstrength factor,  $\Omega_o$ , must be equal to  $2^{1/2}$ ; and the deflection amplification factor,  $C_d$ , must be equal to 2. The maximum building height is 35 feet (10.6 m) for buildings located in Seismic Design Category D areas.

Structural members, systems and components, including boundary studs and plates, must be anchored to resist design forces and to provide continuous load paths for these forces to the foundation.

#### 4.3 Thermal Barrier:

The sheathing may be used as a thermal barrier for foam plastic insulation when installed in accordance with Section 4.1.

#### 4.4 One-hour Fire-resistance-rated, Limited-load-bearing Wall Assembly:

For use in a one-hour fire-resistance-rated wall assembly,  $\frac{5}{8}$ -inch-thick (16 mm) e<sup>2</sup>XP Type X Extended Exposure Sheathing must be applied horizontally to the outside face of the wall, of minimum nominally 2-by-4 wood studs spaced at a maximum of 16 inches (406 mm) on center. A layer of  $\frac{5}{8}$ -inch-thick (16 mm) Type X gypsum board conforming to ASTM C1396 (or  $\frac{5}{8}$ -inch-thick Type X e<sup>2</sup>XP sheathing) must be installed on the interior side of the wall. The boards must be attached using minimum  $1\frac{7}{8}$ -inch-long (47.6 mm) galvanized 6d nails, spaced at 8 inches on center (203 mm) at the edges and 16 inches on center (406 mm) at intermediate studs. The wall framing used in the fire-resistance-rated wall assembly must be designed in accordance with the applicable code, and the design compressive stress of the studs must be further limited by the least of the following:

- 488 psi (3365 kPa)
- 100 percent of  $F_c'$
- 100 percent of  $F_c'$  at an assumed slenderness ratio,  $l_e/d$ , of 33.

$F_c'$  must be determined in accordance with the NDS.

#### 4.5 Other Fire-resistance-rated Wall Assemblies:

One layer of  $\frac{5}{8}$ -inch-thick (15.9 mm) e<sup>2</sup>XP Type X Extended Exposure Sheathing may be substituted for each layer of the Type X gypsum sheathing specified in IBC Table 720.1(2), for the exterior faces of assemblies numbered 13-1.1, 13-1.3, 14-1.3, 14-1.5, 15-1.1, 15-1.5, and 15-1.6.

### 5.0 CONDITIONS OF USE

The e<sup>2</sup>XP Extended Exposure Sheathing 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 The e<sup>2</sup>XP sheathing must be installed in accordance with this report and the manufacturer's published installation recommendations. A copy of the recommendations must be available at all times on the jobsite during installation. If there is a conflict between the manufacturer's published installation recommendations and this report, this report governs.
- 5.2 e<sup>2</sup>XP sheathing must not be used as a nailing base, and any mechanical attachments of exterior coverings must be made directly to the framing.
- 5.3 An approved water-resistive barrier and exterior wall covering approved by the code official must be provided over the sheathing as weather protection.
- 5.4 Use as a fire-resistance-rated assembly is limited to the axial loads described in Section 4.4.
- 5.5 Shear walls using the e<sup>2</sup>XP sheathing must not be used to resist forces imposed by masonry and/or concrete walls.
- 5.6 The sheathing is manufactured in Medicine Lodge, Kansas; Mt. Holly, North Carolina; Phoenix, Arizona; and Waukegan, Illinois; under a quality control program with inspections by ICC-ES.

### 6.0 EVIDENCE SUBMITTED

- 6.1 Reports of physical property testing in accordance with ASTM C473, for compliance with ASTM C1177.
- 6.2 Reports of surface-burning tests in accordance with ASTM E84.
- 6.3 Reports of noncombustibility tests in accordance with ASTM E136.
- 6.4 Reports of fire-resistance testing in accordance with ASTM E119.
- 6.5 Reports of transverse load tests in accordance with ASTM E330.
- 6.6 Engineering calculations.
- 6.7 Quality documentation.

### 7.0 IDENTIFICATION

- 7.1 Each e<sup>2</sup>XP Extended Exposure Sheathing and e<sup>2</sup>XP Extended Exposure Sheathing Type X board must bear a label that includes the report holder's name (National Gypsum Company), a plant identifier and date code, the product name, the board thickness, and the evaluation report number (ESR-2743).
- 7.2 The report holder's contact information is the following:

**NATIONAL GYPSUM COMPANY**  
**2001 REXFORD ROAD**  
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