

ICC-ES Evaluation Report

ESR-2743

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This report is subject to re-examination in one year.
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DIVISION: 09—FINISHES
Section: 09250—Gypsum Board
REPORT HOLDER:

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EVALUATION SUBJECT:
GOLD BOND BRAND® e²XP® 1/2-INCH AND 5/8-INCH TYPE X, EXTENDED EXPOSURE GYPSUM SHEATHING
1.0 EVALUATION SCOPE
Compliance with the following codes:

- 2006 *International Building Code*® (IBC)
- 2006 *International Residential Code*® (IRC)

Properties evaluated:

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

2.0 USES

e²XP 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 e²XP 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

e²XP 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 C 1177, and the physical property requirements for exterior gypsum soffit board and treated core gypsum sheathing board in ASTM C 1396. The sheathing is available in two varieties: 1/2-inch-thick (12.7 mm) e²XP Extended Exposure Sheathing and 5/8-inch-thick (15.9 mm) e²XP, Type X, Extended Exposure Sheathing. The sheathing is 48 inches (1219 mm) wide and is available in various lengths.

e²XP Extended Exposure Sheathing is classified as noncombustible in accordance with ASTM E 136, and exhibits a flame-spread index of 25 or less, and a smoke-developed index of 450 or less, in accordance with ASTM E 84.

4.0 DESIGN AND INSTALLATION
4.1 Installation:

e²XP Extended Exposure Sheathing must be installed in accordance with the manufacturer's published installation recommendations, this report, and ASTM C 1280 for IBC applications or IRC Section R702.3.5 for IRC applications. e²XP 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 e²XP Extended Exposure Sheathing when approved by the code official.

4.2 Design:

e²XP Extended Exposure Sheathing and e²XP 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.

e²XP Extended Exposure Sheathing and e²XP Type X Extended Exposure Sheathing may be used as components of wood-framed engineered shear walls for resisting wind loads when installed as described in Section 4.2.2. Design wind loads must be determined in accordance with Section 1609 of the IBC. The design wind loads must not exceed the allowable racking shear capacity shown in Section 4.2.2 of this report.

The sheathing may also be used as a component of wood-framed engineered shear walls for resisting seismic loads when installed as described in Section 4.2.2. For seismic applications in wood construction under the IBC and IRC, recognition is limited to Seismic Design Categories A and B, and to a maximum building height of 35 feet (10.6 m) in Seismic Design Categories C and D. The response modification factor, R , must be equal to 2; the system over-strength factor, Ω_o , must be equal to $2^{1/2}$; and the deflection amplification factor, C_d , must be equal to 2. Design loads must be determined in accordance with Section 1613 of the IBC, and must not exceed the racking shear capacity of the wall.

4.2.1 Steel Stud Curtain Wall: For an allowable positive and negative transverse wind load pressure of 21.6 psf (1.03 kN/m²), e²XP Extended Exposure Sheathing is fastened to minimum 3⁵/₈-inch-deep, 1¹/₄-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 1¹/₂-inch-thick e²XP sheathing, or 24 inches (609 mm) for 5⁸/₈-inch-thick e²XP sheathing. Sheathing fasteners must be minimum 1¹/₄-inch-long (25.4 mm), No. 6, bugle-head, self-drilling, corrosion-resistant tapping screws complying with ASTM C 1002, 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 3⁸/₈ inch (9.5 mm).

4.2.2 Wood Stud Shear Wall: When applied to wood stud walls, the 1¹/₂-inch-thick (12.7 mm) e²XP Extended Exposure Sheathing has an allowable racking shear capacity for resisting wind and seismic loads of 68.9 plf (1005 N/m). Similarly, the 5⁸/₈-inch-thick (15.9 mm) e²XP Type X Extended Exposure Sheathing has an allowable racking shear capacity for resisting wind and seismic loads of 81.1 plf (1184 N/m). The maximum height-to-length ratio of the shear wall must not exceed 1:1. End studs and plates must be anchored to resist the design forces. The e²XP Extended Exposure Sheathing must be installed with the long dimension in the vertical direction and all edges backed by framing. The sheathing must be fastened using galvanized roofing nails with 3⁸/₈-inch-diameter (9.5 mm) heads and 0.120-inch-diameter (3.1 mm) shanks, spaced at a maximum of 4 inches (101 mm) on center along the edges, and at a maximum of 8 inches (203 mm) on center along intermediate supports. The nails must be at least 1¹/₂ inches long (38.1 mm) for the 1¹/₂-inch sheathing, and 1³/₄ inches long (44.5 mm) for the 5⁸/₈-inch sheathing, installed at a minimum edge distance of 1¹/₂ inch (12.7 mm). The framing must be minimum nominally 2-by-4 with a specific gravity of 0.50, spaced at a maximum of 16 inches (406 mm) on center for the 1¹/₂-inch e²XP, and a maximum of 24 inches (610 mm) on center for the 5⁸/₈-inch e²XP.

4.3 Thermal Barrier:

The sheathing may be used as a thermal barrier for foam plastic insulation when installed in accordance with ASTM C 1280.

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

For use in a one-hour fire-resistance-rated wall assembly, 5⁸/₈-inch-thick (16 mm) e²XP 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 5⁸/₈-inch-thick (16 mm) Type X gypsum board

conforming to ASTM C 1396 (or 5⁸/₈-inch-thick Type X e²XP sheathing) must be installed on the interior side of the wall. The boards must be attached using minimum 1¹/₈-inch-long (47.6 mm) galvanized 6d nails, spaced at 8 inches on center (203 mm) at the edges and 8 inches on center (203 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:

- 381 psi (2627 kPa)
- 78 percent of F'_c
- 78 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 5⁸/₈-inch-thick (15.9 mm) e²XP 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 e²XP 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 e²XP 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 e²XP 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 e²XP 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 Underwriters Laboratories (AA-668).

6.0 EVIDENCE SUBMITTED

- 6.1 Reports of physical property testing in accordance with ASTM C 473, for compliance with ASTM C 1177.
- 6.2 Reports of surface-burning tests in accordance with ASTM E 84.
- 6.3 Reports of noncombustibility tests in accordance with ASTM E 136.

- 6.4 Reports of fire-resistance testing in accordance with ASTM E 119.
- 6.5 Reports of racking shear tests in accordance with ASTM E 72 and Section 4.1 of the ICC-ES Acceptance Criteria for Racking Shear Evaluation of Proprietary Sheathing Materials Used as Braced Wall Panels (AC269), dated February 2009.
- 6.6 Reports of transverse load tests in accordance with ASTM E 330.

6.7 Engineering calculations.

7.0 IDENTIFICATION

Each e²XP Extended Exposure Sheathing and e²XP 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, the name of the inspection agency (Underwriters Laboratories [AA-668]), and the evaluation report number (ESR-2743).