



ICC-ES Evaluation Report ESR-4635

Reissued June 2022

Revised August 2023

This report is subject to renewal June 2024.

DIVISION: 09 00 00—FINISHES
Section: 09 28 15—Magnesium Oxide Backing Panels

DIVISION: 06 00 00— WOOD, PLASTICS AND COMPOSITES
Section: 06 16 00—Sheathing
Section: 06 16 26—Underlayment

REPORT HOLDER:

HUBER ENGINEERED WOODS, LLC

EVALUATION SUBJECT:

**EXACOR® NOMINAL 1½-INCH (12MM) THICK
MAGNESIUM OXIDE SHEATHING PANEL**

**EXACOR® NOMINAL 5⁄8-INCH (16MM) THICK
MAGNESIUM OXIDE SHEATHING PANEL**

1.0 EVALUATION SCOPE

Compliance with the following codes:

- 2021 and 2018 *International Building Code* (IBC)
- 2021 and 2018 *International Residential Code* (IRC)

For evaluation for compliance with codes adopted by the Los Angeles Department of Building and Safety (LADBS), see [ESR-4635 LABC and LARC Supplement](#).

Properties evaluated:

- Structural
- Durability
- Limited Use as Alternate to Fire-Retardant Treated Wood Structural Panels
- Surface Burning Characteristics

2.0 USES

EXACOR® Nominal 1½ inch (12 mm) and 5⁄8 inch (16 mm) thick sheathing panels are intended for the following uses:

2.1 EXACOR® sheathing panels are suitable for use as exterior wall sheathing in Type V construction.

2.2 EXACOR® sheathing panels are suitable for use as exterior wall sheathing in nonbearing walls where fire-resistance rated construction is not required in buildings

of Type I and II construction. (IBC Section 603.1 Item 1 Subsection 1.2).

2.3 EXACOR® sheathing panels are suitable for use as exterior wall sheathing in Type III construction (2021 IBC Section 602.3 and Tables 601 and 705.5; 2018 IBC Section 602.3 and Tables 601 and 602).

2.4 EXACOR® sheathing panels are suitable for use as flooring underlayment in Types III and V construction when installed per this report and the manufacturer's installation instructions.

2.5 EXACOR® sheathing panels are suitable for use as projection protection in accordance with Section 705.2.3 of the IBC (2021) or as an alternate material to fire-retardant-treated wood for use in fire-resistance rated projections listed in Table R302.1(1) and Table R302.1(2) of the IRC (2021).

2.6 EXACOR® sheathing panels are suitable for use as exterior wall sheathing in Type IV-HT under the 2021 IBC (Section 602.4.4.1) and Type IV construction under the 2018 IBC (Section 602.4.1).

2.7 EXACOR® sheathing panels are suitable for use as floor underlayment in Type IV-C and Type-HT construction under the 2021 IBC (2021 IBC Sections 602.4.3 and 602.4.4).

2.8 EXACOR® sheathing panels may be used as intermittent wall bracing panels within designated braced wall lines in accordance with Section 4.2.2 and as shearwall panels in accordance with Section 4.2.1.

3.0 DESCRIPTION

3.1 General:

EXACOR® panels are ½ (12 mm) inch and 5⁄8 inch (16 mm) thick magnesium-oxide sheets, reinforced with multiple fully embedded fiberglass mesh layers. The panels have a smooth-side and a rough-side. The panels are available 4 feet (1.22 m) wide in lengths of 8 feet (2.44 m), 9 feet (2.7 m) and 10 feet (3.66 m).

3.2 Surface-Burning Characteristics:

EXACOR® sheathing panels achieve a class A surface burning classification in accordance with IBC Section 803.1.2. with a flame spread index of 10 or less and a smoke-developed index of 5 or less when tested in accordance with ASTM E84.

4.0 DESIGN AND INSTALLATION

4.1 Design:

4.1.1 Use as Structural Sheathing on Walls: EXACOR® sheathing panels may be used on exterior walls. Use on exterior walls requires the panels to be protected by a water resistive barrier in accordance with 2021 IBC Section 1402.2. When installed in accordance with Section 4.2.2 of this report, the sheathed walls are limited to the allowable uniform transverse loads as described in Table 1. When installed in accordance with Section 4.2.1 of this report, the sheathed walls are limited to the allowable shear resistance values shown in Table 2 and a shear wall aspect ratio of 2:1. Use of the sheathing panels for shear resistance is limited to resisting wind loads and seismic loads in seismic design categories A, B and C.

4.1.2 Use as Floor Underlayment: EXACOR® sheathing panels may be used as floor underlayment on top of wood structural panels and framing sized and constructed to meet the applicable building code requirements.

4.2 Installation:

4.2.1 Shear Wall Applications:

EXACOR® sheathing panels must be installed on wood framing members spaced not more than 24 inches (406 mm) on center. Sheathing panels may be installed vertically or horizontally with the smooth side away from the framing. Framing members must be nominal 2-by sawn lumber with a minimum specific gravity of 0.42. When used in the construction of shear walls, all joints and panel edges shall be backed or blocked by framing. The sheathing panels must be attached using a minimum of 0.113-inch x 2-inch (2.8 x 50.8 mm) galvanized ring shank nails with a minimum $\frac{3}{8}$ -inch (9.5 mm) or $\frac{3}{4}$ inch (19.1 mm) edge distance. The fastener on-center spacing around the perimeter and in the field of the sheathing panels shall be as those specified in Table 2 with no fasteners installed within 2 inches (50.8 mm) of any corner of the sheathing panels.

4.2.2 Prescriptive Wall Bracing:

EXACOR® sheathing panels are recognized for use in intermittent braced wall panel construction in accordance with IRC Section 602.10.2, and braced wall construction in accordance with 2021 and 2018 IBC Section 2308.6 when installed in accordance with Table 3 of this report. The panels are evaluated for use as an alternate material to the wood structural panels used in Bracing Method WSP and may be used with amounts of bracing (lengths) specified in IRC Table R602.10.3(1). The minimum effective braced wall panel length must be 48 inches (1219 mm) for wall heights up to 10 feet (3048 mm), 4 feet 5 inches (1346 mm) for wall not exceeding 11 feet (3352 mm) in height, and 4 feet 10 inches (1473 mm) for walls not exceeding 12 feet (3658 mm) in height. For prescriptive wall bracing under this section, evaluation is limited to areas where engineered wind design is not required per IRC Section R301.1.1 and in Seismic Design Categories (SDC) A, B, and C. Holes and notches in wood framing are permitted in accordance with IRC Section R602.6.

4.2.3 Other Wall Applications:

EXACOR® sheathing panels not used for structural bracing or shear walls must be installed with 0.113-inch x 2 inch (2.8 x 50.8 mm) galvanized ring shank nails at a maximum spacing of 6 inches on center on panel edges and 12 inches on center in the field. Fasteners shall not be within 2 inches (50.8 mm) of any corner.

4.2.4 Use as Floor Underlayment:

EXACOR® sheathing panels used as floor underlayment must be fully supported by wood structural panel subflooring designed to limit the maximum deflection, including live and dead loads, to L/360 of the span, in accordance with the applicable code. Wood structural subflooring shall be installed in accordance with the applicable building codes. Any flatness or surface quality requirements of the structural subflooring shall be addressed prior to installing the EXACOR® underlayment top layer. Installation shall be in accordance with the manufacturer's installation instructions and the applicable codes.

5.0 CONDITIONS OF USE

The EXACOR® Sheathing Panels 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** EXACOR® sheathing panels must be installed in accordance with this report and the manufacturer's published installation instructions. In the event of a conflict between this report and the manufacturer's published installation instructions, this report governs.
- 5.2** The support framing shall be designed for a maximum allowable assembly deflection of L/360 under seismic or wind loads for exterior or interior walls.
- 5.3** EXACOR® sheathing panels shall not be used in applications exposed to weather such as breezeways, balconies, or similar weather exposed applications and must not be used in wet areas such as public toilets and showers as defined in IBC Section 2509
- 5.4** Installation of a vapor retarder in exterior walls must be in accordance with code requirements.
- 5.5** Fasteners and metal components in contact with EXACOR® sheathing panels shall be inherently resistant to corrosion, coated for corrosion resistance or permanently separated by a non-metallic material.
- 5.6** EXACOR® sheathing panels when used as a component of shear walls (racking shear), are limited to use in Seismic Design Categories A, B and C under the IBC and IRC.
- 5.7** Use of EXACOR® sheathing panels in fire-resistance-rated construction is outside the scope of this report.
- 5.8** EXACOR® sheathing panels used as exterior sheathing must be covered with a code recognized water-resistive barrier or one that is the subject of a current ICC-ES evaluation report.
- 5.9** When EXACOR® sheathing is not installed as bracing or as an engineered shear wall, the stud walls must be braced by other materials in accordance with the applicable code.
- 5.10** Shear walls using EXACOR® sheathing must not be used to resist forces imposed by masonry or concrete walls.
- 5.11** Use of EXACOR® sheathing in horizontal diaphragms is outside the scope of this report.
- 5.12** Use of EXACOR® panels in roof applications is outside the scope of this report.
- 5.13** Use of EXACOR® panels with metal framing is outside the scope of this report.
- 5.14** EXACOR® is not for use to resist wind uplift forces or combined uplift and shear forces.

5.15 Exterior wall coverings (siding) installed over EXACOR® must be installed in accordance with the code and the siding manufacturer's published installation instructions. All exterior coverings must be fastened back to framing or blocking.

5.16 EXACOR® sheathing may be used in non-weather exposed locations where fire-retardant treated wood structural panels are allowed in the applicable codes for the end uses noted in Sections 2.2 through 2.6 of this evaluation report.

5.17 EXACOR® sheathing is manufactured 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 Fiber-reinforced Magnesium-oxide-based Sheets (AC386) dated July 2023.

6.2 Data in accordance with the ICC-ES Acceptance Criteria for Reinforced Cementitious Sheets Used as Wall and Ceiling Sheathing and Floor Underlayment (AC376) Dated August 2012 Editorially revised January 2021.

6.3 Data in accordance with the ICC-ES Acceptance Criteria for Fiber-Cement interior Substrate sheets Used in Wet and Dry Areas (AC378) Dated August 2012 Editorially Revised January 2021.

6.4 Data in accordance with the ICC-ES Acceptance Criteria for Proprietary Sheathing Jobsite-Attached to Wood Light-Framed Wall Construction Used as Shear

Walls (AC269.2) Dated October 2013 Editorially Revised October 2021.

6.5 Data in accordance with the ICC-ES Acceptance Criteria for Proprietary Sheathing Attached to Wood Light-Frame Wall Constructions Used as Braced Wall Panels Under the IRC (AC269.1), dated February 2017 (editorially revised October 2021).

6.6 Test data in accordance with ASTM E84 extended for an additional 20-minute period where the flame front did not progress more than 10.5 ft (3.05 m).

7.0 IDENTIFICATION

7.1 The ICC-ES mark of conformity, electronic labeling, or the evaluation report number (ICC-ES ESR-4635) along with the name, registered trademark, or registered logo of the report holder must be included in the product label.

7.2 In addition, each EXACOR® Sheathing panel shall be identified by a stamp or label on the board bearing the identification of the manufacturing facility, production date and/or lot number, the product name (EXACOR®).

7.3 The report holder's contact information is the following:

HUBER ENGINEERED WOODS LLC
10925 DAVID TAYLOR DRIVE, SUITE 300
CHARLOTTE, NORTH CAROLINA 28262
(800) 933-9220
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TABLE 1—ALLOWABLE TRANSVERSE WIND LOADS^{1, 2, 3, 4}

NOMINAL PANEL THICKNESS (inches)	MAXIMUM SUPPORT SPACING (in)	0.113 x 2 INCH RING SHANK NAILS (psf)	FASTENER ON-CENTER SPACING (Perimeter/Field)
1/2	24	± 38	4/6
5/8	24	± 68	4/6

For **SI** 1 inch = 25.4 mm; 1 psf = 4.88 kg/m²

¹Minimum nominal 2 inch by 4 inch wood studs spaced a maximum of 24 inches on center.

²Nails shall be located a minimum of 3/8 inch from panel edges. No fastener shall be located within 2 inches of a corner.

³All panel edges must be backed by framing.

⁴Table values assume panels are supported over 3 supports (2-span) and a deflection limit of $L/360$.

TABLE 2—FASTENING REQUIREMENTS AND ALLOWABLE SHEAR CAPACITY FOR EXACOR® SHEATHING FOR WIND OR SEISMIC LOADING UNDER THE 2021 AND 2018 IBC (ENGINEERED METHOD)^{1, 2, 3}

NOMINAL PANEL THICKNESS (inches)	FASTENING REQUIREMENTS			ALLOWABLE SHEAR CAPACITY (plf)
	Fastener Specifications	Panel Edge Distance (inches)	On-Center Spacing (Perimeter/Field) (inches)	
$\frac{1}{2}$	0.113 inch x 2 inch galvanized ring shank nails	$\frac{3}{8}$	4/6	270
			3/6	330
		$\frac{3}{4}$	3/6	335
$\frac{5}{8}$	0.113 inch x 2 inch galvanized ring shank nails	$\frac{3}{8}$	4/6	265
			3/6	300
		$\frac{3}{4}$	3/6	340

For **SI**: 1 inch = 25.4 mm; 1 plf = 14.6 N/m

¹Minimum nominal 2 inch by 4 inch wood studs spaced a maximum of 24 inches on center.

²All fasteners located a minimum of $\frac{3}{8}$ inch or $\frac{3}{4}$ inch from panel edges and no closer than 2 inches from panel corners. Double studs are required where the panel edge distance is $\frac{3}{4}$ inches.

³All panel edges must be backed by framing or blocking.

TABLE 3—FASTENING REQUIREMENTS FOR EXACOR® SHEATHING FOR WIND OR SEISMIC LOADING UNDER THE 2021 AND 2018 IRC (WSP PRESCRIPTIVE METHOD)^{1, 2, 3}

NOMINAL PANEL THICKNESS (inches)	FASTENING REQUIREMENTS	
	Fastener Specifications	On-Center Spacing (Perimeter/Field) (Inches)
$\frac{1}{2}$	0.113 inch x 2 inch galvanized ring shank nails	4/6
$\frac{5}{8}$	0.113 inch x 2 inch galvanized ring shank nails	4/6

For **SI**: 1 inch = 25.4 mm

¹Minimum nominal 2 inch by 4 inch wood studs spaced a maximum of 24 inches on center.

²All fasteners located a minimum of $\frac{3}{8}$ inch or $\frac{3}{4}$ inch from panel edges and no closer than 2 inches from panel corners. Double studs are required where the edge distance is $\frac{3}{4}$ inch.

³All panel edges must be backed by framing or blocking.

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Section: 09 28 15—Magnesium Oxide Backing Panels

DIVISION: 06 00 00—WOOD, PLASTICS, AND COMPOSITES

Section: 06 16 00—Sheathing

Section: 06 16 26—Underlayment

REPORT HOLDER:

HUBER ENGINEERED WOODS, LLC

EVALUATION SUBJECT:

EXACOR® NOMINAL 1/2-INCH (12MM) THICK MAGNESIUM OXIDE SHEATHING PANEL

EXACOR® NOMINAL 5/8-INCH (16MM) THICK MAGNESIUM OXIDE SHEATHING PANEL

1.0 REPORT PURPOSE AND SCOPE

Purpose:

The purpose of this evaluation report supplement is to indicate that EXACOR® 1/2-inch and 5/8-inch thick magnesium oxide sheathing panels, described in ICC-ES evaluation report [ESR-4635](#), have also been evaluated for compliance with the codes noted below as adopted by the Los Angeles Department of Building and Safety (LADBS).

Applicable code editions:

- 2023 *City of Los Angeles Building Code* (LABC)
- 2023 *City of Los Angeles Residential Code* (LARC)

2.0 CONCLUSIONS

The EXACOR® 1/2-inch and 5/8-inch thick magnesium oxide sheathing panels, described in Sections 2.0 through 7.0 of the evaluation report [ESR-4635](#), comply with the LABC Chapters 6, 8, 14, and 23, and the LARC, and are subject to the conditions of use described in this supplement.

3.0 CONDITIONS OF USE

The EXACOR® 1/2-inch and 5/8-inch thick magnesium oxide sheathing panels, described in this evaluation report supplement must comply with all of the following conditions:

- All applicable sections in the evaluation report [ESR-4635](#).
- The design, installation, conditions of use and identification of the EXACOR® panels are in accordance with the 2021 *International Building Code*® (IBC) provisions noted in the evaluation report [ESR-4635](#).
- The design, installation and inspection are in accordance with additional requirements of LABC Chapters 16, 17 and 23, as applicable.
- Under the LABC and LARC the panels shall not be used as part of the lateral force resisting system.

This supplement expires concurrently with the evaluation report, reissued June 2022 and revised August 2023.

ICC-ES Evaluation Report

ESR-4635 CBC and CRC Supplement

Reissued June 2022

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1.0 REPORT PURPOSE AND SCOPE

Purpose:

The purpose of this evaluation report supplement is to indicate that EXACOR® 1/2-inch and 5/8-inch-thick magnesium oxide sheathing panels, described in ICC-ES evaluation report ESR-4635, have also been evaluated for compliance with the codes noted below.

Applicable code editions:

■ 2022 California Building Code (CBC)

For evaluation of applicable Chapters adopted by the California Office of Statewide Health Planning and Development (OSHPD) AKA: California Department of Health Care Access and Information (HCAI) and the Division of State Architect (DSA), see Sections 2.1.1 and 2.1.2 below.

■ 2022 California Residential Code (CRC)

2.0 CONCLUSIONS

2.1 CBC:

The EXACOR® 1/2-inch and 5/8-inch-thick magnesium oxide sheathing panels, described in Sections 2.0 through 7.0 of the evaluation report ESR-4635, comply with CBC Chapters 6, 8, 14 and 23, provided the design and installation are in accordance with the 2021 *International Building Code*® (IBC) provisions noted in the evaluation report and the additional requirements of CBC Chapters 16, 17, 23, as applicable.

2.1.1 OSHPD: The applicable OSHPD Sections and Chapters of the CBC are beyond the scope of this supplement.

2.1.2 DSA: The applicable DSA Sections and Chapters of the CBC are beyond the scope of this supplement.

2.2 CRC:

The EXACOR® 1/2-inch and 5/8-inch-thick magnesium oxide sheathing panels, described in Sections 2.0 through 7.0 of the evaluation report ESR-4635, comply with CRC Chapters 3, 5, 6 and 7, provided the design and installation are in accordance with the 2021 *International Residential Code*® (IRC) provisions noted in the evaluation report and the additional requirements of CRC Chapters 5 and 6, as applicable.

This supplement expires concurrently with the evaluation report, reissued June 2022 and revised August 2023.

ICC-ES Evaluation Report

ESR-4635 FBC Supplement

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Purpose:

The purpose of this evaluation report supplement is to indicate that EXACOR® 1/2-inch and 5/8-inch thick sheathing panels, described in ICC-ES evaluation report ESR-4635, have also been evaluated for compliance with the codes noted below.

Applicable code editions:

- 2023 Florida Building Code—Building
- 2023 Florida Building Code—Residential

2.0 CONCLUSIONS

The EXACOR® Nominal 1/2-inch and 5/8-inch thick sheathing panels, described in Sections 2.0 through 7.0 of the ICC-ES evaluation report ESR-4635 complies with the *Florida Building Code—Building* or the *Florida Building Code—Residential*. The design requirements must be determined in accordance with the *Florida Building Code—Building* or the *Florida Building Code—Residential*, as applicable. The installation requirements noted in ICC-ES evaluation report ESR-4635 for the 2021 *International Building Code*® meet the requirements of the *Florida Building Code—Building* or the *Florida Building Code—Residential*, as applicable, with the following conditions:

- Use as wall sheathing in Type IV construction must be in accordance with FBC Section 602.4.1.
- Use as floor underlayment in Type IV construction is not permitted.

Use of the EXACOR® Nominal 1/2-inch and 5/8-inch thick sheathing panels for compliance with the High-Velocity Hurricane Zone provisions of the *Florida Building Code—Building* or the *Florida Building Code—Residential* has not been evaluated, and is outside the scope of this supplemental report. For products falling under Florida Rule 61G20-3, verification that the report holder's quality assurance program is audited by a quality assurance entity approved by the Florida Building Commission for the type of inspections being conducted is the responsibility of an approved validation entity (or the code official when the report holder does not possess an approval by the Commission).

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