EXACOR™

Sheathing Installation Manual

NOTE: ALL INFORMATION CONTAINED IN THIS DOCUMENT ALSO APPLIES TO EXTREMEGREEN® BRANDED MAGNESIUM OXIDE CEMENT PANELS MANUFACTURED AFTER MARCH 30, 2020.

Installation Manual Overview

This manual is intended to provide general information to the designer, contractor, and end user. The following instructions will help you properly install EXACOR™ wall sheathing panels. We urge you, and anyone installing this product, to read these instructions in their entirety prior to installation. This manual is general in nature and does not cover every installation condition. Proper installation shall be deemed to mean the most restrictive requirement specified by Huber Engineered Woods LLC ("Huber Engineered Woods"), applicable building code(s), engineer or architect of record or other authority having jurisdiction. You are fully and solely responsible for all safety requirements and code compliance. For additional information contact Huber Engineered Woods.

EXACOR™ Wall Sheathing Product Overview

EXACOR wall sheathing panels are fire resistant,[1] high-density, structural magnesium oxide cement panels. When used as exterior wall sheathing, EXACOR panels can replace fire-retardant treated plywood or OSB, and exterior gypsum sheathing panels in certain fire-resistant rated wall assemblies. These instructions apply to nominal 1/2-in. (12mm) and 5/8-in. (16mm) thicknesses.

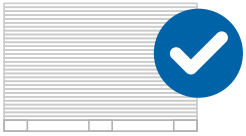
Available Sizes & Dimensions

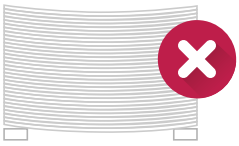
- EXACOR wall sheathing panels are available in nominal 1/2-in. (12mm) and 5/8-in. (16mm) thicknesses
- Panels are manufactured in nominal 48-inch face width (1220mm) and nominal 96-in. (2440 mm), 108-in. (2750mm) and 120-in. (3050mm) lengths.
- Panels feature a straight (square) edge profile.

Uses & Limitations

- Panels are intended for use in exterior wall sheathing applications only.
- EXACOR panels can be exposed to weather during construction for up to 200 days.
- Huber Engineered Woods does not currently support any EXACOR™ panel uses in roof, ceiling, or interior wall sheathing applications.
- Panels are intended for use in exterior wall sheathing applications that will only be exposed to weather during construction.
- Panels do not serve as a water-resistive-barrier. EXACOR panels must be covered with code-compliant water-resistive barrier and exterior cladding for all exterior wall sheathing applications including open corridors and breezeways.
- Panels can be used in certain fire rated assemblies. See Fire-Resistant-Rated Assemblies section in this manual for details.
- Always consult local building codes and designer of record for fire-resistant-rated design requirements.
- Fasteners and bare metal components in direct contact with EXACOR panels shall be inherently resistant to corrosion or coated for corrosion resistance (hot-dipped galvanized or better).

Storage





- EXACOR panels must be stored in a cool, dry environment and must remain in the manufacturer's packaging.
- EXACOR panels must be stored on the manufacturer's pallets off the ground with full support underneath (image right). To protect edges from damage, do not store EXACOR panels vertically.
- To prevent the risk of injury, do not stack EXACOR panels higher than 11 feet high (6 units, level, aligned and stacked).
- Panels should not be stored loosely or near standing water.
- When not contained in original packaging, cover EXACOR panels with a waterproof material when stored outdoors or on site to protect against weather, direct sunlight, surface contamination, and construction traffic.

1. ASTM E119 - Standard Test Methods for Fire Tests of Building Construction and Materials. EXACOR sheathing panels may be used in specific published fire-resistant-rated wall assemblies.

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Precautions + Safe Handling

- Always consult the Safety Data Sheet (SDS) for safety, hazard, and first aid instructions.
- Wear appropriate personal protective equipment for the job. Suggested safety gear includes:
  - Gloves and long sleeves.
  - Dust masks and/or respirators to minimize dust inhalation during cutting, drilling, or notching.
  - Safety glasses or goggles.
- Use work practices that minimize the creation of dust. Adequate ventilation, dust collection for power saws and frequent jobsite cleanup are recommended.
- Wash hands after handling.
- Observe good industrial hygiene practices.
- Ensure that forklift or similar equipment is rated as capable of lifting and moving loads. Forks must extend completely under the entire load.
- For Handling:
  - Two persons are recommended when loading or handling individual EXACOR™ panels.
  - Panels are heavier than typical structural panels. Always use proper lifting techniques.
  - Hold panels with hands spaced apart along the long-length of panel to prevent excessive bending/flexing (image right).

Cutting

- A fine-tooth handsaw, gypsum board (drywall) saw, or power saw are all recommended to cut EXACOR panels. For power saws, using a fiber-cement blade may result in cleaner edge cuts, less dust, and longer blade life. Support both ends of the board when cutting.
- To perform cut-outs in EXACOR panels, for plumbing, electrical outlets, light switches, etc., carefully measure and mark the location of the opening on the smooth side of the panel before making a cut. If using a jigsaw, drill a starter hole in the corner of the proposed cut-out and start cut from there. Alternatively, cut-outs can be removed using a hole saw, roto-zip, or equivalent hand tool. Carbide tip blades may provide longer service life when cutting EXACOR panels.
- For 1/2-inch thicknesses, panels may be cut by scoring and snapping. Use a specialized scoring tool for best results.

Physical Properties

Product	nom. 1/2-in (12mm)	nom. 5/8-in (16mm)
Width & Tolerances	nom. 48-in. (1220mm) +/- 5/64-in. (2mm)	nom. 48-in. (1220mm) +/- 5/64-in. (2mm)
Length & Tolerances	nom. 96-in. (2440mm) nom. 108-in. (2750mm) nom. 120-in. (3050mm) +/- 5/64-in. (2mm)	nom. 96-in. (2440mm) nom. 108-in. (2750mm) nom. 120-in. (3050mm) +/- 5/64-in. (2mm)
Thickness & Tolerances	nom. 1/2-in. (12mm) +/- 1/16-in. (1.5mm)	nom. 5/8-in. (16mm) +/- 1/16 in. (1.5mm)
Weight	approx. 2.7 lbs/sf	approx. 3.3 lbs/sf
Edge Profile	Straight (Square) Edge	Straight (Square) Edge
Surface Burning Characteristics (ASTM E84 /UL 723) Surface burning/smoke developed	0/0[1]	0/0[1]
Fire Resistance (ASTM E119)	Fire resistant[2]	Fire resistant[2]
Water Vapor Permeable (ASTM E96 Method B) (ASTM E96 Method A)	≥ 13 perms[3] ≥ 5 perms[3]	≥ 13 perms[3] ≥ 5 perms[3]
Mold Resistance (ASTM G21)	0 Mold Growth Observed[4]	0 Mold Growth Observed[4]

1. ASTM E84 Standard Method for Surface Burning Characteristics of Building Materials conducted on 1/2-in and 3/4-in EXACOR panel thicknesses.
2. ASTM E119 Standard Test Methods for Fire Tests of Building Construction and Materials. EXACOR sheathing panels may be used in specific fire-resistant-rated wall assemblies. Follow published fire-resistance rated assembly requirements and consult local building codes and designer of record for fire-resistant design requirements.
3. ASTM E96 Standard Test Methods for Water Vapor Transmission of Materials conducted on 1/2-in. and 3/4-in. EXACOR™ products.
4. ASTM G21 Standard Practice for Determining Resistance of Synthetic Polymeric Materials to Fungi conducted on 1/2-in. EXACOR™ product.

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Lateral Force Resisting Systems

Maximum Allowable Uniform Shear Loading for Wood Framed Walls

Panel Thickness	Fastener	Fastener Schedule oc. (edge / field)	Maximum plf shear loading
1/2-in. EXACOR™ wall sheathing	#10 x 1.625-in Simpson Strong-Tie® CB3BLG Screws	4-in. / 6-in.	230
	#10 x 1.625-in Simpson Strong-Tie® CB3BLG Screws	3-in. / 12-in.	245
	0.113-in x 2-in galvanized ring-shank nails	4-in. / 6-in.	230
5/8-in. EXACOR™ wall sheathing	#10 x 1.625-in Simpson Strong-Tie® CB3BLG Screws	4-in. / 6-in.	215
	0.113-in x 2-in galvanized ring-shank nails	4-in. / 6-in.	220

- Shear wall designs are limited to designs controlled by wind or seismic design categories A, B and C.
- Shear walls are limited to a maximum height-to-length aspect ratio of 2:1
- Maximum plf shear loading may be increased for wind-controlled designs permitted in accordance with governing code.
- Minimum 2x4 wood framing members not spaced more than 24-inches on center
- All panel edges must be backed with framing or blocking.
- All fasteners located a minimum of 3/8-in. from panel edges and no closer than 2-in from panel corners.

Installing EXACOR™ Wall Sheathing

General

- EXACOR™ wall sheathing panels must be installed in accordance with instructions contained in this Installation Manual and the applicable fire-resistant-rated design assembly. Should these instructions contradict, the most stringent requirements shall govern.
- Install EXACOR™ panels either vertically, (long dimension parallel to studs), or horizontally, (long dimension perpendicular to studs).
- Panels must be butted tight to one another.
- EXACOR wall sheathing panels shall not be installed less than 8 in. from exposed earth unless an approved method of protection against termites and decay is approved by the local building official.
- EXACOR wall sheathing must be protected by a code compliant water-resistive-barrier. The water-resistive-barrier shall be attached with flashing in such a manner as to be continuous behind the exterior wall veneer. See **Water-Resistive Barriers** section for additional information.
- Follow UL and ICC-ES Listing Report instructions for fire-resistant assemblies.

Framing

- Install EXACOR wall sheathing panels smooth side facing out. The rough, grid side must be in contact with the framing member.
- Framing width shall not be less than 1-1/2 in. wide for wood framing
- Wall framing members shall be plumb and in-plane. EXACOR panels will not correct out-of-plane irregularities in wall framing members.

Fastening

- Fasteners must be code-recognized and shall be inherently resistant to corrosion or coated for corrosion resistance (hot-dipped galvanized or better).
- Install fasteners straight and perpendicular to EXACOR™ wall sheathing panels and framing
- See **Product Application** section for fastening schedule.
- Fasteners must be spaced 3/8-inch from all edges and no closer than 2-inch from a corner.
- All fasteners shall be flush or slightly driven below the EXACOR panel surface. Any fasteners that are proud of the panel surface shall be driven flush.
- Gypsum screws should not be used to attach panels to framing.

Screws

- Always use a code recognized powder coated, stainless steel, or yellow zinc coated fiber-cement board or wood screws. Screws with nibs are recommended for improved counter-sinking.
- Min. #10 x 1.625-in. screws with a maximum on-center spacing of 6-in on edges and 12-in in the field to be used when attaching 1/2-inch (12mm) and 5/8-inch (16mm) wall sheathing panels for non-shear wall applications. Refer to **Lateral Force Resisting Systems** section for screw requirements for shear wall applications.

Nails

- Always use a code recognized corrosion resistant nail, such as hot-dipped galvanized, to attach EXACOR™ panels to framing.
- Min. 0.113 x 2-in. (50.8mm) ring shank nails with a maximum on-center spacing of 6-in on edges and 12-in in the field to be used when attaching 1/2-in. (12mm) and 5/8-in. (16mm) EXACOR™ wall sheathing panels for non-shear wall applications. Refer to **Lateral Force Resisting Systems** section for nailing requirements for shear wall applications.

Product Application

Wall systems designed with EXACOR wall sheathing shall be consistent with the applications as described in this section. When EXACOR™ panels are used as an element to resist lateral wind loading, the panels shall be installed in accordance with the **Lateral Force Resisting Systems** section above and in accordance with applicable evaluation service report.

When panels are NOT used as part of a shear wall or braced wall, EXACOR wall sheathing can be installed on framing spaced a maximum of 24-in. o.c. with fasteners spaced a maximum of 6-in. o.c. around the perimeter of the panel, and 12-in. o.c. at the intermediate stud locations in the field of the panel.

When used in fire-resistance rated construction, follow all details and requirements as set forth in the applicable fire-resistance rated design.

Repair

- Small divots and imperfections in EXACOR™ panels can be patched with an elastomeric patching compound that is intended to be used over concrete/masonry substrates. Following patching compound manufacturer's recommendations for gap filling limitations and applications. Use minor sanding to smooth patched surfaces.
- For damage that creates a hole through the panel, the area around the damage must be replaced with a new piece of EXACOR sheathing. Replacement panels must be no less than 24-in width and cover a minimum of two spans (three wall studs). Add nominal 2x blocking at the panel seams to support edges.

Fire-Resistant Assemblies

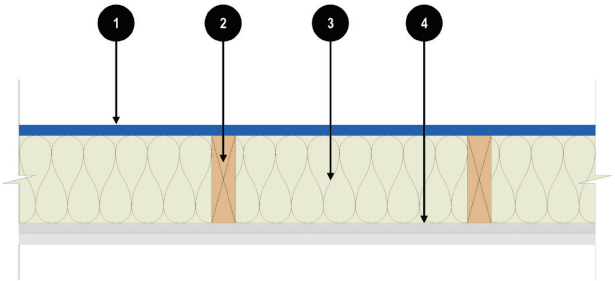
- Information below is for guidance and reference only. Consult the listing at www.ul.com for the complete report.
- Huber Engineered Woods currently does not support any EXACOR™ panel uses in ceiling applications, even if permitted in the full UL report.
- EXACOR panels can be used as part of an assembly to meet or exceed STC/IIC requirements for dwelling separations.

Non-Combustible:

- EXACOR panels are fire resistant[1] as tested in accordance with ASTM E119. They also score a 0-flame spread and 0-smoke developed rating when tested in accordance with ASTM E84.[1]

U069: 2 Hour Fire-Resistant Assembly

Wood Framing – Load Bearing



Key:

1.	5/8-in. EXACOR™ sheathing
2.	2x6 wood studs spaced max. 16-in. o.c.
3.	Mineral wool insulation
4.	Two layers of 5/8-in. Type X gypsum wall board

ASTM E119 - Standard Test Methods for Fire Tests of Building Construction and Materials. EXACOR sheathing panels may be used in specific published fire-resistant-rated wall assemblies.

1. Follow published fire-resistance rated assembly requirements and consult local building codes and designer of record for fire-resistant design requirements. E84 Standard Test Method for Surface Burning Characteristics of Building Materials conducted on 1/2-in. and 3/4-in. EXACOR panel thicknesses.

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Exterior Finish Wall Coverings

Most conventional exterior sidings, claddings and wall coverings, including vinyl, composite, metal, stone, brick and wood may be applied over EXACOR™ wall sheathing. The below depictions are not intended for design or specification purposes but are for illustration only. Always follow cladding manufacturer and applicable building code requirements for the installation of finish cladding materials. All exterior wall covering fasteners must be attached back to solid framing. EXACOR™ panels must be covered with a code-compliant water-resistive barrier and exterior cladding for all exterior wall sheathing applications including open corridors and breezeways.

Water-Resistive Barriers

A code compliant water resistive barrier must always be applied over EXACOR wall sheathing prior to the installation of finish exterior wall covering. See the Stucco and Adhered Masonry Veneers section below for additional requirements when applying stucco or adhered stone over EXACOR wall sheathing. All water-resistive barriers and accompanying flashing must be installed in accordance with the manufacturer's written instructions.

Mechanically Fastened Sheet Membranes

Conventional mechanically fastened sheet membranes or wraps must be installed using plastic-capped corrosion resistant fasteners.

Self-Adhered Sheet and Fluid-Applied Membranes

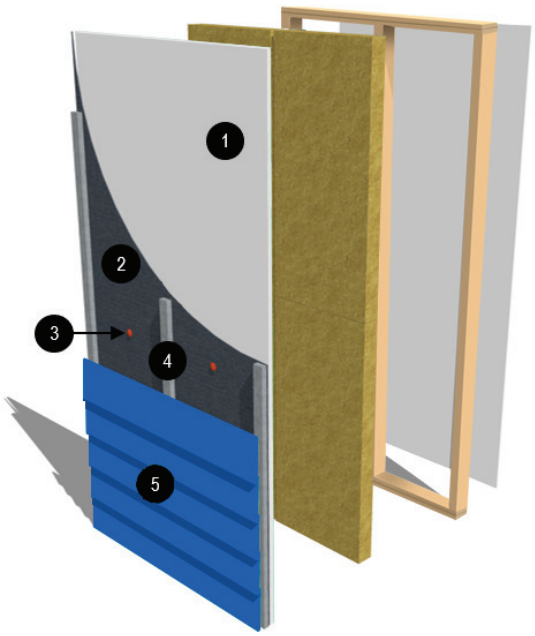
Before applying any water or air resistive barrier that relies on adhesion to its substrate and in order to produce the best possible adhesion and longevity, ensure that all panel surfaces are dry, clean, sound and free of any dust or dirt left over from cutting, sanding or general construction site activities, including oil and grease. Check water-resistive barrier manufacturer's adhesion requirements and compatibility with wall cladding.

Rainscreens/Back-Venting

Rainscreens, or back-venting, which are a physical gap between the water-resistive barrier and the finish claddings, are becoming commonplace because of their ability to promote enhanced drainage and drying in the wall system. Some building codes and cladding manufacturers are beginning to mandate their use. Some typical methods for back-venting include the use of furring strips, drainage mats or other proprietary systems. Rainscreens are recommended to be incorporated with EXACOR wall sheathing for all cladding types where applicable.

Conventional Siding

Typical siding materials such as wood, fiber cement, vinyl, metal and other horizontal siding applications can be installed over EXACOR sheathing. All cladding must be securely fastened to framing, blocking or furring with corrosion resistant (hot-dipped galvanized or better) fasteners. Follow all cladding manufacturer or applicable building code requirements.



Key:

1.	EXACOR™ sheathing
2.	water resistive / air barrier
3.	plastic capped fasteners
4.	rain screening / furring strips
5.	external finish wall covering

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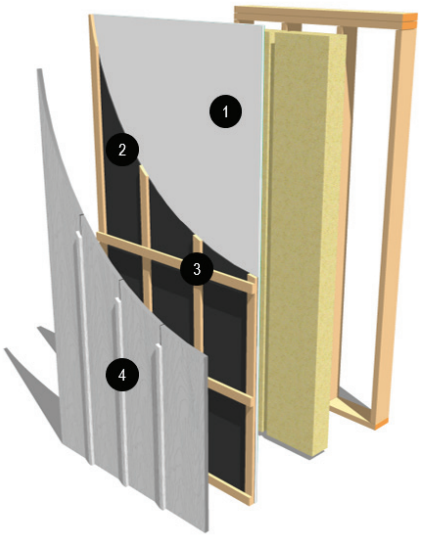
Continuous Exterior Insulation

Many states and local code jurisdictions have implemented requirements for higher R-value exterior walls, aimed at increasing energy efficiency. Continuous exterior insulation materials, such as expanded polystyrene (EPS), extruded polystyrene (XPS) and polyisocyanurate, are often installed on the exterior side of walls in order to meet these requirements. Ensure all water-resistive barriers and accompanying flashing materials are installed over EXACOR wall sheathing prior to the installation of continuous insulation.

Providing additional drainage between the insulation board and the water-resistive barrier is recommended. This can be achieved with drainage channels such as V-notches or grooves incorporated into the backside of the insulation board, or by providing a drainage space as referenced in the **Rainscreens/Back-Venting** section. This can also be achieved by using proprietary building wraps that incorporate drainage capabilities into the material itself. All insulation and exterior wall covering materials should be securely fastened to framing or furring with corrosion resistant fasteners. Consult the local building code and wall covering manufacturer requirements for proper attachment of siding with continuous insulation.

Board and Batten Siding

Board and batten siding, or other similar types of vertically installed siding, must be installed in accordance with manufacturer's published instructions. When using furring strips to install siding, board and batten should be fastened to furring strips that are installed in a manner as to allow drainage of the assembly. Horizontal furring strips should never be applied directly to the water-resistive barrier, as this may prevent or impede drainage and may void the water-resistive barrier manufacturer's warranty. An example of an appropriate installation would be horizontal furring strips applied over vertical furring or over proprietary drainage products. All furring should be securely fastened to framing.

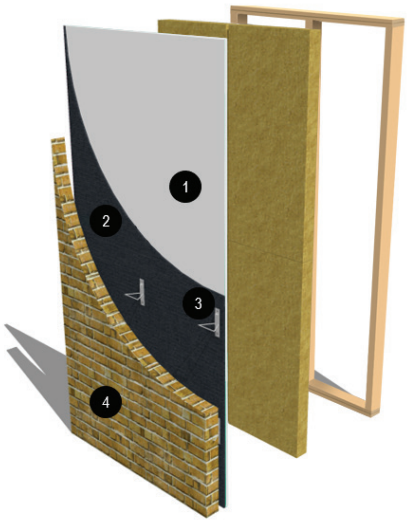


Key:

1.	EXACOR™ sheathing
2.	water resistive / air barrier
3.	horizontal furring installed over vertical furring / drainage
4.	board and batten

Brick Cavity Wall

Anchored masonry veneer must be installed with the minimum clear airspace as defined by governing code. This airspace is typically 1-in. minimum. Corrosion resistant masonry ties must be securely fastened through the EXACOR™ wall sheathing and into the framing with corrosion resistant fasteners. Follow the requirements of the local building code, authority having jurisdiction, manufacturer and/or designer of record for spacing of masonry ties.



Key:

1.	EXACOR™ sheathing
2.	water resistive / air barrier
3.	brick ties
4.	brick or stone veneer masonry

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Stucco and Adhered Masonry Veneers

Conventional stucco, adhered masonry veneers and adhered thin brick, may be applied over EXACOR wall sheathing. Similar to installation over wood sheathing, the application of stucco and adhered masonry veneer over EXACOR wall sheathing requires proper detailing of water management layers and careful execution. Installation of lath shall be in accordance with ASTM C1063 Standard Specification of Installation of Lathing and Furring to Receive Interior and Exterior Portland Cement-Based Plaster.

Requirements for water-resistive barriers are as follows:

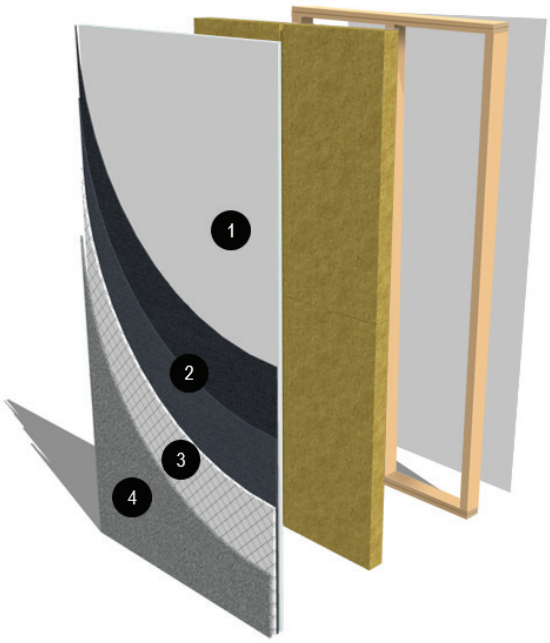
Dry Climates (B Climates Less than 20-in. of rain per year)
One of the following must apply for dry climate zones:

1. Two layers of water-resistive barrier that have a water resistance equal to or greater than ASTM E2556, Type I or two layers of 10-minute Grade D paper. The individual layers must be installed independently such that each layer provides a separate continuous plane and any flashing is installed in a manner to drain between the layers of water-resistive barrier.

2. One layer of water-resistive barrier that has a water resistance equal to or greater than ASTM E2556, Type II or one layer of 60-minute Grade D paper. The water-resistive barrier must be separated from the stucco by a layer of foam plastic insulating sheathing or other non-water absorbing layer or designed drainage space.

Moist or Marine Climates (A or C Climates: 20-in. of rain or more per year)
In addition to meeting the requirements for dry climates, a space or drainage material not less than 3/16-in. (4.8mm) in depth must be applied to the exterior side of the water-resistive barrier.

Lath must be mechanically fastened through the EXACOR wall sheathing into framing. Install the stucco system in accordance with the manufacturer's instructions and local building code requirements.



Key:

1.	EXACOR™ sheathing
2.	2 layers of water resistive barrier
3.	lath
4.	conventional stucco system

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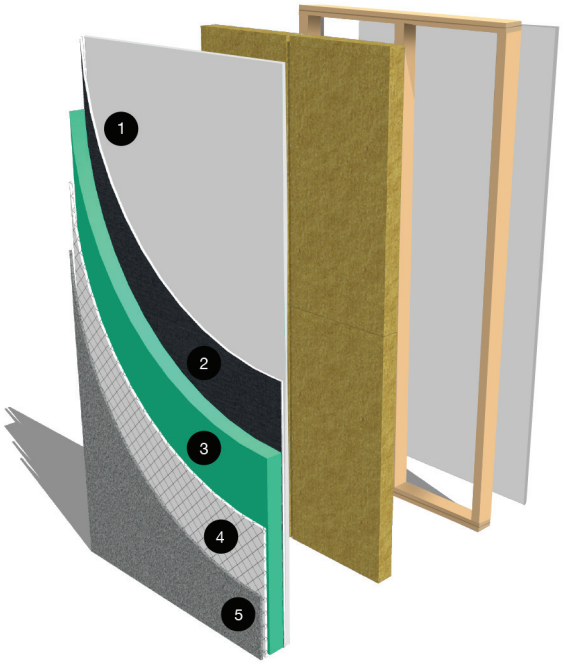
Exterior Insulation and Finish Systems (EIFS)

Follow all EIFS manufacturer requirements and recommendations for selection and installation of air and water-resistive barriers over EXACOR wall sheathing.

For adhesively attached EIFS, check with EIFS manufacturer for compatibility and warranty information. Ensure that all panel surfaces are dry, clean, sound and free of any dust, dirt, oil or grease prior to applying the air and water-resistive barrier. Ensure all water-resistive barriers and accompanying flashing materials are installed over EXACOR wall sheathing prior to the installation of continuous insulation.

For non-adhered, mechanically fastened only EIFS installation, additional drainage between the insulation board and the water-resistive barrier should be provided in accordance with manufacturer and building code requirements. Ensure all water-resistive barriers and accompanying flashing materials are installed over EXACOR wall sheathing prior to the installation of continuous insulation.

Install subsequent layers of continuous insulation, mesh or lath, and mortar coats in accordance with local building code, manufacturer, or designer of record's requirements. All insulation materials should be securely fastened to framing or furring with corrosion resistant fasteners.



Key:

1.	EXACOR™ sheathing
2.	water resistive / air barrier
3.	polystyrene insulation
4.	reinforcing mesh embedded in base coat
5.	finish coat

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