

GP Georgia-Pacific

DensElement[®]

Barrier System



INSTALLATION GUIDE



System Solutions

DensElement® Barrier System unites science with technology. Comprised of only approved components, it has undergone rigorous performance testing for conformance with the current water-resistive barrier and air barrier requirements of the International Building Code (IBC) and the International Energy Conservation Code (IECC). Today, those components include:

- DensElement® Sheathing
- DensDefy® Liquid Flashing
- DensDefy® Transition Membrane

Revolutionizing the Water-Resistive & Air Barrier System

Keep walls dry. It sounds simple, but time and time again water infiltration is the main culprit for failure within a building envelope. History has proven that typical construction will allow some moisture to penetrate either the structural wall or rough openings. It's not a question of if moisture will get into a building; it's a question of when.

So how can you ensure that when moisture gets into your building that it can get out too? The DensElement® Barrier System, with AquaKor™ Technology is the answer. Until now, industry-accepted water-resistive and air barrier (WRB-AB) products have not delivered fully:

- Building wraps may rip and tear even in mild breezes, let alone strong storms. Even where they stay on, staple holes may provide air and water access to the structural walls.
- Conventional fluid-applied WRB-AB membrane systems can be time and labor intensive, requiring installers to coat the entire sheathing surface with potential coating thickness variations.
- DensElement Barrier System eliminates the WRB-AB application step, so the system is faster and easier to install than fluid-applied, self-adhered and building wrap applications.

Scientifically Enhanced

The key to the unique benefits offered by the DensElement® Barrier System can be found in its proprietary advancement, AquaKor™ Technology, which integrates the gypsum core and the fiberglass mat to form a hydrophobic, monolithic surface that blocks bulk water but allows vapor to pass through. This eliminates the need for a separate WRB-AB, which reduces the potential for installer error associated with field-applied WRB-AB systems. The end result is a faster, easier installation process that provides the protection of a continuous WRB-AB.

Every seam or penetration causes potential for moisture intrusion. So, for maximum protection, the system is complete with tested and approved DensDefy® Liquid Flashing, which fills and seals seams, fasteners, openings, penetrations and transitions.

DensElement® Sheathing must be installed in accordance with the instructions in this brochure, Gypsum Association publication GA-253 Application of Gypsum Sheathing and ASTM C1280 Standard Specification for Application of Exterior Gypsum Panel Products for Use as Sheathing.



SHEATHING INSTALLATION INSTRUCTIONS

Framing

DensElement® Sheathing can be installed on wood or metal framing spaced up to a maximum 24 inches on center. Use appropriate framing and spacing specific to fire assemblies, shear wall applications or as required by the design authority. Wood framing width shall be a minimum of 1-½" (38 mm) and steel framing width shall be a minimum of 1-¼" (32 mm). Framing members must be in plane with not more than 1/8" (3 mm) variation from the plane of adjacent framing members. Framing fasteners shall not protrude more than ⅛" (3 mm) to ensure the sheathing will be installed against the framing.

Do not apply DensElement Sheathing directly to cementitious or masonry surfaces. When abutting concrete or masonry, provide a minimum ¼" gap between sheathing and cementitious surface.

Cutting Sheathing

DensElement® Sheathing can be cut from the face side by scoring and snapping or by sawing. To score the panel, use a sharp knife to cut through the gold facer into the gypsum core, then snap the cut panel back away from the cut face and finally cut the back facer along the crease.

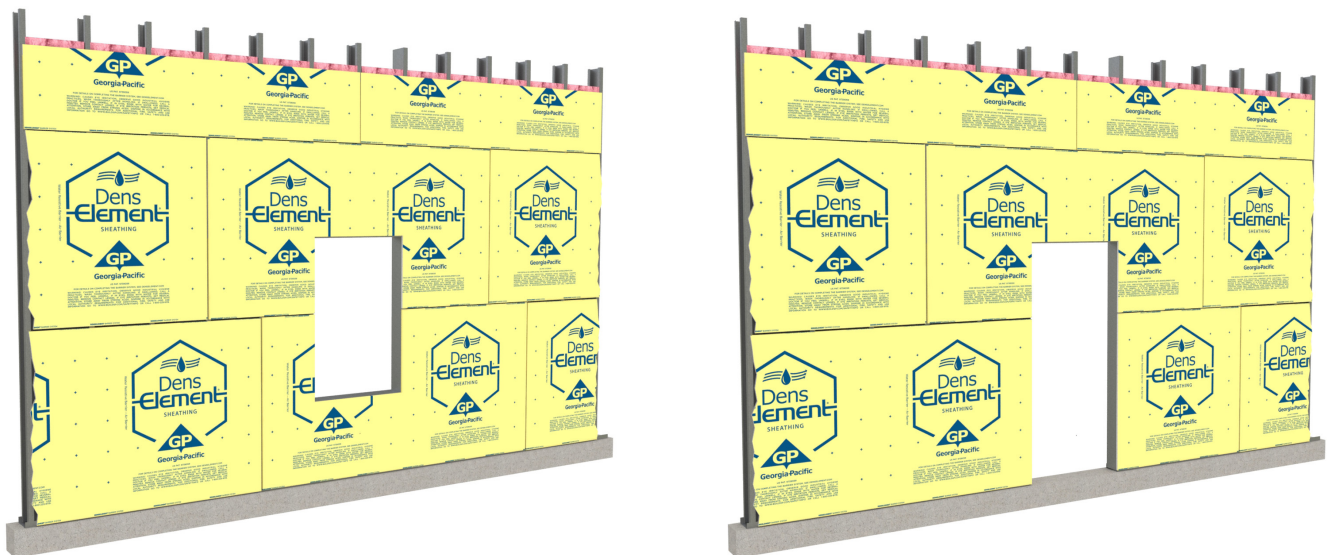
Where gypsum sheathing meets projecting surfaces, the gypsum sheathing shall be neatly scribed and cut. Cutouts for pipes or other small openings can be cut with a saw. All cut edges and ends of gypsum sheathing shall be trimmed to obtain neat-fitting joints when gypsum sheathing is installed.

Sheathing Installation

DensElement® Sheathing can be installed parallel or perpendicular to wood or metal framing. Use appropriate board orientations specific to fire assemblies, shear wall applications or as required by the design authority.

Install DensElement Sheathing with end joints staggered on horizontal applications and vertical applications (when applicable). Ends and edges of the DensElement Sheathing should fit tightly and be in moderate contact. DensElement Sheathing shall not be less than 8" (203 mm) from the finish grade in weather-protected siding systems, and not less than 12" (305 mm) from the ground for properly drained crawl spaces.

Gypsum sheathing shall not be continuous through building construction joints. Consult with design authority for control-joint recommendations. Gypsum sheathing shall be located so that panel seams shall be offset a minimum of 4" (100 mm) from the corner of openings.



SHEATHING INSTALLATION INSTRUCTIONS

Fastening

Fasteners shall be driven flush with the panel surface into the framing and not countersunk. Fasteners should not expose the gypsum core and fastener heads should not break through the fiberglass facer. Locate perimeter fasteners at least $\frac{3}{8}$ " (9 mm) from the ends and edges of the panel. Fastener spacing should be a maximum of 8" (203 mm) on center along framing, but use appropriate fastener spacing specific to fire assemblies, shear wall applications or as required by the design authority.

Nails or screws, as listed in the Fastener Guide, may be used to attach DensElement® Sheathing to framing. Care should be taken when driving screws to not strip the framing member around the screw shank.

Fastening and Framing







Thickness	Framing Spacing	Panel Orientation	Fastener Spacing – Wood Framing ¹	Fastener Spacing – Metal Framing ¹
$\frac{5}{8}$ " (15.9 mm)	24" (610 mm) o.c. max ²	Parallel ² or perpendicular	8" (203 mm) o.c. field ³ & perimeter	8" (203 mm) o.c. along framing

¹ Fire-rated assemblies may require additional fasteners; see specific assembly details.

² For racking strength resistance, apply panel edges parallel with framing spaced a maximum of 16" (406 mm) on center (o.c.) for $\frac{5}{8}$ " (15.9 mm) DensElement® Barrier System.

³ Fastener spacing around the perimeter of the wall and along intermediate vertical framing members.

Fastener Guide

Fastener*	Type	Length for 5/8-in.- (15.9 -mm-) Thick Sheathing	Description	Application
	Type S-12	1 $\frac{1}{4}$ " (32 mm)	Bugle head fine thread, corrosion-resistant drill point drywall screw	DensElement® Sheathing to heavy-gauge metal framing (18 gauge or thicker)
	Type S	1 $\frac{1}{4}$ " (32 mm)	Bugle head fine thread, corrosion-resistant sharp point drywall screw	DensElement Sheathing to light-gauge metal framing furring (20-25 gauge)
	Type W	1 $\frac{5}{8}$ " (41 mm)	Bugle head, rust-resistant, coarse thread sharp point screw	DensElement Sheathing to wood framing
	Type W, S and S-12	1 $\frac{1}{4}$ " (32 mm) metal 1 $\frac{5}{8}$ " (41 mm) wood	Wafer head, corrosion-resistant screws, drill or sharp point	DensElement Sheathing to heavy-gauge or light-gauge, metal or wood framing
	ASTM C514 and 12 gauge	1 $\frac{3}{4}$ " (45 mm)	11-gauge, galvanized nail	DensElement Sheathing to wood framing
	16 gauge galvanized staples	1 $\frac{5}{8}$ " (41 mm)	No. 16 gauge, flattened, galvanized, divergent point wire staples with not less than a 7/16 in.- (11 mm-) wide crown outside measure	DensElement Sheathing to wood framing

*For screws, meet or exceed ASTM C1002 or C954. Contact fastener manufacturer for correct amount of corrosion resistance.

DENSDEFY® LIQUID FLASHING AND DENSDEFY® TRANSITION MEMBRANE INSTALLATION INSTRUCTIONS

To receive flashing materials, surfaces must be clean, sound, and free of frost, dust, dirt, debris, contaminants and other bond-inhibiting agents. Treated lumber must be dry and may be solvent wiped with isopropyl alcohol to aid adhesion of DensDefy™ Products. DensDefy® Liquid Flashing can be applied to damp surfaces and tolerates moisture exposure after application. To receive DensDefy® Transition Membrane, surfaces must be completely dry.

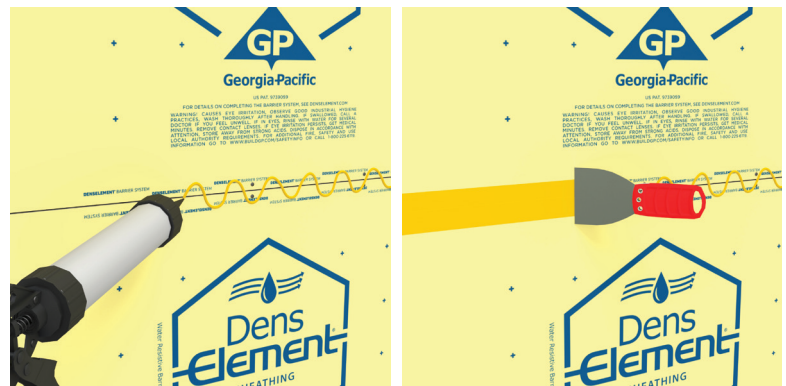
Dispense DensDefy Liquid Flashing from a 20-oz. sausage-type caulking gun. At 70°F (21°C) and 50% relative humidity, liquid flashing begins to skin within 30–60 minutes. DensDefy Liquid Flashing is moisture curing. Low temperatures and low relative humidity slow curing time. High temperatures and high relative humidity accelerates curing time. Protect adjacent surfaces. Clean tools and equipment with mineral spirits or similar solvent

immediately after use. Cured liquid flashing must be removed mechanically. Follow all safety precautions.

DensDefy Transition Membrane is available in 6-, 9- and 12-in.- (152.4-, 228.6- and 304.8-mm-) wide rolls. When using DensDefy Transition Membrane, determine appropriate widths and lengths prior to cutting. DensDefy Transition Membrane may be cut with scissors or a sharp utility knife. Use of longest lengths possible will minimize overlaps. For longer lengths, additional applicators may help avoid wrinkles or fish mouths. Use a J roller to apply even pressure to fully adhere the membrane and achieve a smooth and wrinkle-free surface. Treat all edges with DensDefy Liquid Flashing

Panel Seams

1. Apply DensDefy® Liquid Flashing over the DensElement® Sheathing seam in a zigzag or ribbon pattern.
2. With a straight-edge tool, spread evenly over the sheathing seam.
3. Apply at a rate to achieve a minimum thickness of 16 wet mils over the entire seam area, leaving no exposed sheathing. Cover a minimum of 1" on both sides of the seam.



Fasteners

1. The fasteners should be spotted with DensDefy Liquid Flashing and wiped down with a straight edge tool, leaving a minimum thickness of 16 wet mils over the entire fastener.



DENSDEFY® LIQUID FLASHING AND DENSDEFY® TRANSITION MEMBRANE INSTALLATION INSTRUCTIONS

Vertical Corners

1. Apply DensDefy Liquid Flashing over the inside and/or outside corner in a zigzag or ribbon pattern.
2. With a straight edge tool, spread evenly over the sheathing corner.
3. Apply at a rate to achieve a minimum thickness of 16 wet mils over the corner area. Cover a minimum of 2" on both sides of the corner.



Material Transitions With DensDefy® Liquid Flashing

1. If the gap between materials is over 1/4", fill the gap between the DensElement® Sheathing and adjacent materials with a backer rod.
2. Apply DensDefy Liquid Flashing over the DensElement Sheathing and adjacent material in a zig-zag or ribbon pattern.
3. Using straight edge tool, spread DensDefy Liquid Flashing over material transition.
4. Apply at a rate to achieve a minimum thickness of 16 wet mils. Ensure the flashing is applied a minimum of 2" on each substrate material surface.



DENSDEFY® LIQUID FLASHING AND DENSDEFY® TRANSITION MEMBRANE INSTALLATION INSTRUCTIONS

Material Transitions With DensDefy® Transition Membrane

1. Choose the appropriate DensDefy Transition Membrane width to achieve a 2" (50 mm) minimum overlap on both sides of the transition. Pre-cut manageable lengths and place over the center of the transition area.

Note: At corners or changes in plane, creasing the membrane prior to placement can help align the membrane.

2. Remove release paper from the DensDefy Transition Membrane and press in place following the contour of the substrate, avoiding wrinkles and fishmouths.
3. Use a J roller to apply even pressure to fully adhere the membrane and achieve a smooth and wrinkle-free surface.
4. Terminate all DensDefy® Transition Membrane edges with a counter flash of DensDefy Liquid Flashing, ensuring liquid flashing covers membrane and adjacent material, leaving no exposed membrane edges.



ROUGH OPENINGS

Rough Openings with DensDefy® Liquid Flashing

1. Rasp any jagged or uneven DensElement® Sheathing edges and clean framing free of debris and dust or other bond-inhibiting materials.
2. Apply a bead of DensDefy Liquid Flashing into the entire width of the inside corners of the opening.
3. Apply DensDefy Liquid Flashing over the entire width of the opening sill, jamb and header in a zig-zag or ribbon pattern.
4. Apply DensDefy Liquid Flashing over the DensElement Sheathing adjacent to the opening sill, jamb and header in a zig-zag or ribbon pattern.
5. With a straight edge tool, spread DensDefy Liquid Flashing over the entire width of the sill, jamb, header and DensElement Sheathing surface adjacent to the opening.
6. Apply at a rate to achieve a minimum thickness of 16 wet mils over the opening area, leaving no exposed sheathing. Cover a minimum of 2" of the sheathing surface adjacent to the opening.

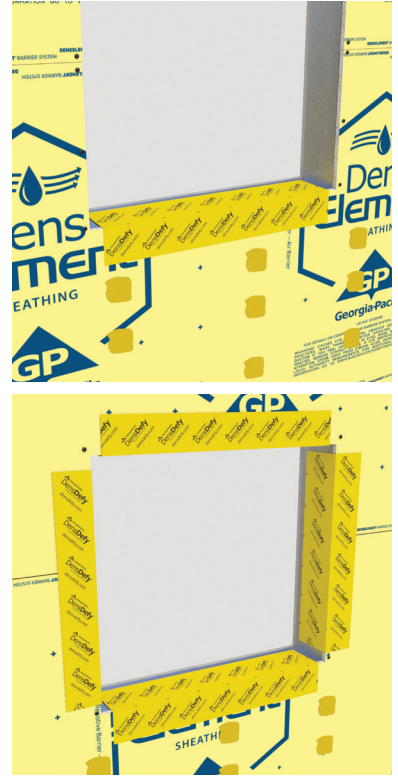


ROUGH OPENINGS

Rough Openings with DensDefy® Transition Membrane

1. Apply corner reinforcement pieces or "bow ties" at rough opening corners.
2. Choose appropriate DensDefy Transition Membrane widths to achieve a 2" (50 mm) minimum overlap on both sides of the change in plane. Refer to project specifications for required treatment dimensions. Pre-cut manageable lengths for handling.

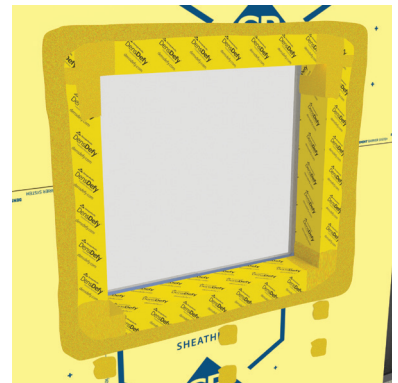
Note: At corners or changes in plane, creasing the membrane prior to placement can help align the membrane.
3. Remove release paper from the DensDefy Transition Membrane and press in place following the contour of the substrate, avoiding wrinkles and fishmouths.
4. Apply pre-cut lengths to sill, covering a minimum of 2" (50 mm) of the sheathing adjacent to the opening and wrap a minimum of 4" (100 mm) up rough opening jambs.
5. Apply pre-cut lengths along rough opening jambs. Overlap, in a shingle-lap fashion, a minimum 2" (50 mm) onto sill protection.
6. Apply pre-cut lengths along rough opening header. Overlap, in a shingle-lap fashion, a minimum 2" (50 mm) onto jamb protection.
7. Use a J roller to apply even pressure to fully adhere the membrane and achieve a smooth and wrinkle-free surface.
8. Terminate all DensDefy Transition Membrane edges with a counter flash of DensDefy® Liquid Flashing, ensuring liquid flashing covers membrane and adjacent material, leaving no exposed membrane edges.



Rough Openings with Combination Method

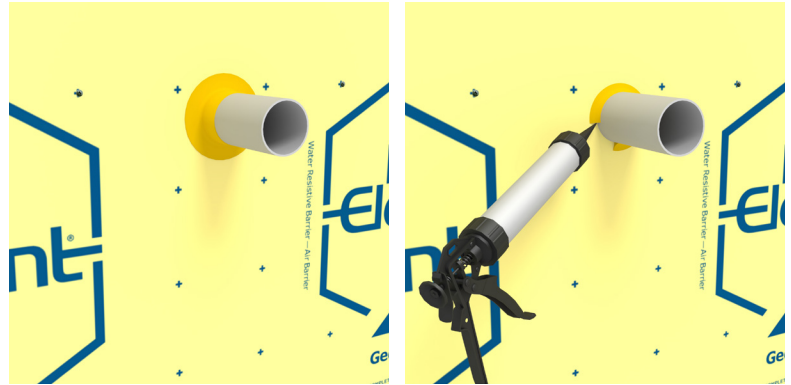
1. Choose appropriate DensDefy Transition Membrane widths to achieve a 2" (50 mm) minimum overlap on both sides of the change in plane. Refer to project specifications for required treatment dimensions. Pre-cut manageable lengths for handling.

Note: At corners or changes in plane, creasing the membrane prior to placement can help align the membrane.
2. Remove release paper from the DensDefy Transition Membrane and press in place following the contour of the substrate, avoiding wrinkles and fishmouths.
3. Apply pre-cut lengths of DensDefy Transition Membrane to sill, jambs and header, keeping membrane 1 - 2" from rough opening corners. Cover a minimum of 2" of the sheathing adjacent to the opening.
4. Use a J roller to apply even pressure to fully adhere the membrane and achieve a smooth and wrinkle-free surface.
5. Apply DensDefy® Liquid Flashing to all rough opening corners, overlapping the membrane edges by at least 1".
6. Terminate all DensDefy Transition Membrane edges with a counter flash of DensDefy Liquid Flashing, ensuring liquid flashing covers membrane and adjacent material, leaving no exposed membrane edges.



PENETRATIONS

1. Mechanically secure penetrations. Penetrations should be rigid and secured mechanically.
2. If the gap between materials is over ¼", install backer rod between penetration and DensElement® Sheathing to form a back dam regardless of size of penetration or opening.
3. Apply a thick bead of DensDefy® Liquid Flashing around the penetration.
4. With a straight edge tool or curved spatula, spread DensDefy Liquid Flashing on the face of the sheathing, over the annulus between the penetration and the sheathing, and onto the penetrating item. Completely seal the joint around the penetration.



DensElement® Barrier System

DensDefy® Liquid Flashing Application Chart*

Container: 20-oz. Sausage

2-inch wide panel seam coverage	
Wet Mil Thickness	Coverage (linear feet)
16 (minimum)	85
24	60
32	42
2x4-inch framed opening coverage	
Wet Mil Thickness	Coverage (linear feet)
16 (minimum)	25-30
24	37-45
32	12-15

* Coverage shown is an estimate only. Actual coverage will vary based on experience level of applicator and other factors such as the width of application area. Coverage assumes that joints and corners are butted tightly together and gaps and voids are prefilled with backer rod. Perform a project mock up to determine more accurate coverage estimates.



Georgia-Pacific Building Products

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SALES INFORMATION AND ORDER PLACEMENT

U.S.A. Pacific Southwest: **1-800-824-7503**
Midwest: **1-800-876-4746**
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North: **1-800-947-4497**
Pacific Northwest: **1-800-444-0092**
South: **1-800-327-2344**
Canada Canada Toll Free: **1-800-387-6823**

TECHNICAL HOTLINE

U.S.A. and Canada: **1-800-225-6119**

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