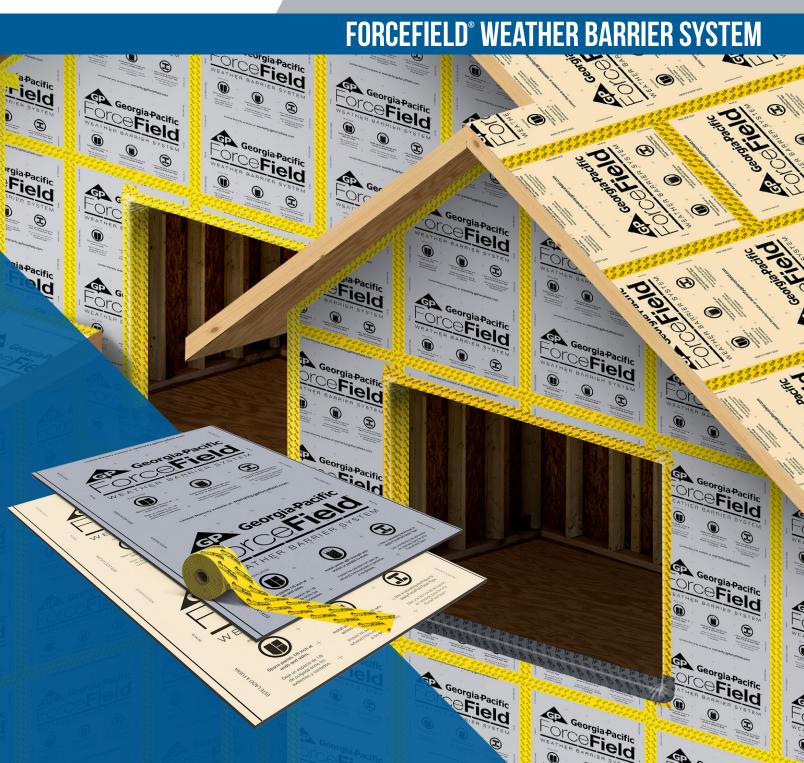




TECHNICAL GUIDE





System Overview

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ForceField® Weather Barrier System from Georgia-Pacific is an integrated water-resistive barrier and air barrier (WRB-AB) sheathing system that can be used across wood-framed structures, from walls to sloped roofs. Ideal for residential, multifamily or commercial construction, ForceField Weather Barrier System reduces the number of trips around the building compared to traditional systems. When ForceField Weather Barrier System is used on walls and roofs, it helps keep structures dry and energy efficient, protecting a builder's investment and reputation during construction and beyond.

Get Structures Dried-In Faster With the Integrated WRB-AB Sheathing System

Engineered wood sheathing panels made with DryGuard® Technology* and an enhanced overlay are at the core of this weather barrier system. ForceField® Panels install like standard oriented strand board (OSB) or plywood sheathing and have the versatility to be used on both wall and sloped roof applications. Both the gray and ivory ForceField Panels can be used on walls or roofs. The gray panel indicates a 7/16 thickness, while the ivory panel represents either a 15/32 or 19/32 thickness. ForceField® Accessories feature an innovative design and proven compatibility to make critical connections at seams, joints and transitions for walls and sloped roofs. When panels are installed, and joints/seams are taped, uncontrolled air movement is reduced, which can help improve the structure's energy efficiency.

ForceField Weather Barrier System may be used as roof sheathing for Type III and Type V Construction under the International Building Code and, where permitted, by local building codes.

Advantages of ForceField® Weather Barrier System

ForceField Panels and proprietary overlay are factory bonded together to create a fully integrated sheathing which forms a barrier that helps keep water out but allows water vapor to escape and promotes drying. Once the panels are installed, and the seams, transitions and rough openings are taped and treated, ForceField Weather Barrier System helps prevent uncontrolled air movement, which helps create a more energy-efficient structure. ForceField Panels come in 8-foot, 9-foot or 10-foot lengths to help installation move at a rapid pace.

Physical Properties

ForceField Panels are Exposure 1-rated OSB suitable for uses not permanently exposed to the weather. Panels classified as Exposure 1 are intended to resist the effects of moisture on structural performance as it may occur due to construction delays or other conditions of similar severity.

For increased racking performance related to shear wall cross-panel strength and stiffness, a Structural 1 ForceField Panel is available. Consult your Georgia-Pacific company sales office or representative for more information

ForceField Weather Barrier System is recognized by the Engineered Wood Association (APA) product reports PR-N136 and PR-N136F as conforming to the requirements of the International Residential Code (IRC), International Building Code (IBC) and 2020 Florida Building Code for use as a structural wood sheathing, roof underlayment, water-resistive barrier and air barrier.

ForceField Weather Barrier System Performance Properties

System Properties	Test Method/Criteria	Results
Panel Exposure Durability Classification	DOC PS 2	Exposure 1
Panel Grade**	DOC PS 2	7/16 CAT
Water-Resistive Barrier	ICC ES AC 310	Meets/Exceeds requirements
Surface Bond of Overlay to Panel	ASTM D5651	>16 psi
Water Penetration	ASTM E331	Pass
Water Vapor Transmission	ASTM E96 (Water Method)	>2.75 Perms for Laminated Panel
Air Permeance of Assembly	ASTM E2357	.0009 cfm/ft2@75 pa
Surface Burning Characteristics	ASTM E84	Meets Class II
Drainage Efficiency	ASTM E2273.	>90%

^{*} Features described here may not be available in all geographic markets. Consult your Georgia-Pacific company sales office or representative for more information

 $[\]begin{tabular}{ll} ** \textbf{Contact ForceField sales for additional panel grade offerings}. \end{tabular}$



Components

ForceField® Seam Tape

ForceField Seam Tape is a pressure-sensitive polymeric film with an acrylic adhesive for treating joints and panel seams in the ForceField® Weather Barrier System wall application. It is serrated for easy tearing and is ideal for residential construction projects.

Roll Size: 3" x 180'

Thickness: Minimum 0.003" Packaging: 8 rolls per case

Typical Characteristics		
Test	Test Method/Criteria	Results
Tensile Strength	PSTC 131	20 lbs/in (90.4 N/25mm)

Temperature Resistance	
Minimum Application Temp	20°F (-6.7°C)



ForceField® Premium Tape

ForceField Premium Tape is a high-performance, self-adhered tape made from a proprietary film with an acrylic adhesive. It can be used to treat both roof and wall panel seams, as well as rough openings and transitions to dissimilar materials.

Roll Size: 3.75" x 90'

Thickness: Minimum 0.0145" **Packaging:** 12 rolls per case

Typical Characteristics		
Test	Test Method/Criteria	Results
Peel Adhesion to Plywood	ASTM D3330 (73.4°F and 50% RH)	≥ 5
Peel Adhesion to OSB	ASTM D3330 (73.4°F and 50% RH)	≥ 5
Peel Adhesion to PVC	ASTM D3330 (73.4°F and 50% RH)	≥ 5
Peel Adhesion to Aluminum	ASTM D3330 (73.4°F and 50% RH)	≥ 5
Tensile Strength	ASTM D412 Meth A	1072 psi
Elongation	ASTM D1970*	800%
Nail Sealability	ASTM D1970*	Pass

Temperature Resistance	
Minimum Application Temp	20°F (-6.7°C)





ForceField® Flex Tape

Available in 6-inch and 9-inch widths, ForceField Flex Tape is a conformable self-adhered flashing tape ideal for treatment of rough opening sills. It is a two-ply oriented high-density film mated to a premium butyl rubber adhesive and release sheet.

Roll Sizes: 6" x 75' 9" x 75'

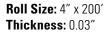
Thickness: Minimum 0.012" Packaging: 2 rolls per case

Typical Characteristics			
Test	Test Method/Criteria	Results	
Low Temp Flexibility	ASTM D903	Pass	
Nail Sealability	ASTM D1970	Pass	



ForceField® Corner Seal

ForceField Corner Seal is an innovative solution from Georgia-Pacific to help protect your building against air and water intrusion in some of the most difficult areas to treat. The product is 4 inches wide and made of semi-rigid polypropylene, with a "living hinge" that allows it to be used for both inside and outside exterior corners. Once installed, the ForceField Corner Seal helps provide additional protection against air and moisture intrusion in what are traditionally some of the most difficult wall areas to treat.



Packaging: 1 roll per case



DensDefy® Liquid Flashing

DensDefy Liquid Flashing is a waterproofing and detailing compound made with silyl terminated polymer (STP) chemistry that seals rough openings, penetrations and material transitions in new or existing wall assemblies. It creates an elastomeric flashing membrane that is highly durable.



professional gun application



DensDefy® Transition Membrane

A 25-mil composite impermeable membrane that is comprised of 16 mils of butyl adhesive and 9 mils of high-density polypropylene (HDPP) facer. It is primarily used as a transitioning accessory between dissimilar materials and where its larger width makes for a more efficient installation.

Packaging: 75' rolls available in 3 widths

Length: 75′ (22 m)

Widths: 6" (15 cm) 8 rolls/box 9" (22 cm) 4 rolls/box 12" (30 cm) 4 rolls/box







Sustainability

Georgia-Pacific Building Products Sustainability

Georgia-Pacific's definition of sustainability is meeting the needs of society today without jeopardizing our ability to do so in the future. We are committed to using resources efficiently to provide innovative products and solutions that meet the needs of customers and society while operating in a manner that is environmentally and socially responsible, as well as economically sound.

We continue to focus on:

- Improving energy efficiency at our manufacturing plants
- Seeking out opportunities to reduce water use, and to reuse water more efficiently
- Finding cost-effective ways to further reduce air emissions
- · Recovering and reusing materials that otherwise would end up in landfills

Green building codes, standards and programs are establishing themselves across the country. They promote the use of products that contribute to the performance of the building, and minimize environmental and human health impacts over the life of the building or home. Because we embrace product performance and operate in an environmentally, socially and economically sound manner, owners and architects can feel good about the structures they build using our products.

Call the Technical Services Hotline at the number below for more information regarding sustainability.

ForceField® Weather Barrier System and Sustainability in Practice

Sustainable design contributions:

- No added urea formaldehyde
- ForceField® Panels are made from wood sourced through a system that is third-party certified to the Sustainable Forestry Initiative® procurement standard
- Regional materials: ForceField Panels are made in the following locations: Clarendon, SC; Fordyce, AR; Hosford, FL





Wall Installation

For full installation instructions and details, refer to the ForceField® Weather Barrier System installation guide.

Nailing the Panels

The gray or ivory overlay side of ForceField® Panels should face away from the framing. Maintain a 1/8-inch gap between panels at all ends and edges. Use a minimum 6d common nail spaced 6 inches o.c. along panel edges and 12 inches o.c. at intermediate supports. If pneumatic nail guns are used, be sure to set air pressure to drive nail heads flush with the panel surface. Flush drive attachments are recommended when using a pneumatic nail gun. Guidelines are included on the panel surface to aid in locating supports for nailing.

Taping the Panel Seams

An approved ForceField® tape from Georgia-Pacific must be used to seal the seams between sheathing panels. For best performance results, treat panel seams as soon as possible. Before the application of tape, ensure



that the sheathing surfaces are free from frost, moisture, dust, dirt and other bond-inhibiting materials. Center the tape over the seam. ForceField Tapes are contact tapes requiring pressure to adequately seal. Apply firm pressure on ForceField Tapes with your hand to ensure that a continuous bond is achieved between the tape and the panel surface, and to eliminate wrinkles and air bubbles. As a best practice, use a J-roller over the tape after hand application. Whenever tape splices occur, a 2-inch overlap should be used. Sequence tape application such that the vertical tape is overlying the horizontal joint tape to ensure a shingle-type application. At T-joints, the tape should overlap by 2-inches.

- A. Insulation
- B. Framing
- C. ForceField® Panel
- D. ForceField® Tape
- E. DensDefy® Liquid Flashing



Taping or Treating Around Openings, Penetrations and Material Transitions

Taping around openings, penetrations and material transitions may be done using a Georgia-Pacific-approved tape, such as ForceField® Premium Tape. Always be sure to follow local building code requirements. Use a J-roller to ensure proper bonding contact and smooth out any wrinkles to ensure full tape-to-panel contact. In addition to ForceField Tapes, DensDefy™ Products are approved for use to treat rough openings, material transitions and penetrations in ForceField Weather Barrier System. See additional information on DensDefy® Liquid Flashing and DensDefy® Transition Membrane at DensDefy.com.



Penetrations

Before the application of DensDefy Liquid Flashing, ensure the panel and adjacent surface are free from moisture, frost, dust, dirt and other bond-inhibiting materials. Penetrations should be rigid and secured mechanically. If the gap between materials is over 1/4 inch, install a backer rod between the penetration and sheathing. Apply a thick bead of DensDefy Liquid Flashing around the penetration. With a straight-edge tool, 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. Apply at a rate to achieve a minimum thickness of 16 wet mils.

- A. Insulation
- B. Framing
- C. ForceField Panel
- D. ForceField Tape
- E. DensDefy Liquid Flashing





Lapped Vinyl Siding and Fiber Cement Siding

Lapped siding should be installed in accordance with the manufacturer's written instructions and local building code requirements. As a best practice, a drainage medium such as a rainscreen drainage mat should be used behind the siding to promote proper drainage.

- A. Insulation
- B. Framing
- C. ForceField® Panel
- D. ForceField® Tape
- E. DensDefy® Liquid Flashing
- F. Rigid Flashing by Others
- G. Rainscreen Drainage Mat (Minimum 1/4" (6 mm) Gap)
- H. Vinyl Starter Track with Weep Holes
- I. Siding



Conventional Stucco

Stucco systems may be applied over ForceField® Weather Barrier System. Install the stucco system in accordance with the manufacturer's instructions and local building code requirements. As a best practice, the system should be properly designed and installed to promote drainage.

- A. Insulation
- B. Framing
- C. ForceField Panel
- D. ForceField Tape
- E. DensDefy Liquid Flashing
- F. Weep Screed by Others
- G. Rainscreen Drainage Mat (Minimum 1/4" (6 mm) Gap)
- H. Felt Paper-Backed Metal Lath by Others
- I. Conventional Stucco System





Mechanically Applied Exterior Insulation and Finish System (EIFS) with Drainage

ForceField® Weather Barrier System is an ideal substrate for the mechanical application of expanded polystyrene (EPS) or extruded polystyrene (XPS) insulation in EIFS applications and may eliminate the need for an EIFS manufacturer's air- and water-resistive barrier coatings. The EIFS should be designed for drainage and installed in accordance with the EIFS manufacturer's written instructions.

- A. Insulation
- B. Framing
- C. ForceField® Panel
- D. ForceField® Tape
- E. DensDefy® Liquid Flashing
- F. Starter Track with Weeps by Others
- G. Rainscreen Drainage Mat (Minimum 1/4" (6 mm) Gap)
- H. Expanded Polystyrene Insulation (Mechanically Attached)
- I. Reinforcing Mesh Embedded in Base Coat
- J. Finish Coat



Brick Cavity Wall

ForceField Weather Barrier System is an ideal substrate for masonry claddings. Brick ties should be installed in accordance with the manufacturer's written installation instructions and local building code requirements. Apply continuous insulation as required by the building code or design authority. Brick veneers should be installed with a continuous air gap of at least 2-inches or per code minimum. As a best practice, design for drainage using mortar control netting and keep mortar and mortar droppings from being in constant contact with ForceField panels.

- A. Insulation
- B. Framing
- C. ForceField Panel
- D. DensDefy Liquid Flashing
- E. Through-Wall Flashing by Others
- F. Termination Bar by Others
- G. Masonry Tie
- H. Extruded Polystyrene Insulation
- I. Mortar Deflection
- J. Brick Veneer





Fiber Cement Panel

ForceField® Weather Barrier System can be used in applications behind a variety of rainscreen assemblies. Rainscreen subframes should be installed allowing for proper drainage, and in accordance with the manufacturer's instructions and code requirements.

- A. Insulation
- B. Framing
- C. ForceField® Panel
- D. ForceField® Tape
- E. DensDefy® Liquid Flashing
- F. Rigid Flashing by Others
- G. Rainscreen Sub-Framing
- H. Fiber Cement





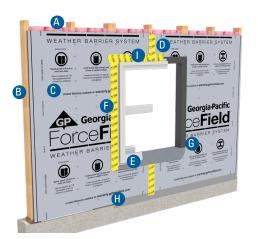
Rough Openings

Flanged Window

ForceField® Premium Tape can be used to treat the rough openings for window and door openings, penetrations and terminations of the exterior wall or where moisture could potentially enter the wall cavity. Always be sure to follow applicable local building code requirements and industry

best practices.

- A. Insulation
- B. Framing
- C. ForceField Panel
- D. ForceField® Flex Flashing Tape
- E. AT Flashing Tape
- F. Flanged Window by Others
- G. ForceField Tape
- H. DensDefy Liquid Flashing



Non-Flanged Window

- A. Insulation
- B. Framing
- C. ForceField® Panel
- D. ForceField® Tape
- E. ForceField® Flex Flashing Tape
- F. AT Flashing
- G. Non-Flanged Window by Others
- H. DensDefy® Liquid Flashing
- I. Head Flashing by Others





Sloped-Roof Installation

For full installation instructions and details, refer to the full ForceField® Weather Barrier System installation manual.

Installing the Panels

When installing ForceField® Panels on the roof, orient the panel so the gray or ivory weather-barrier side faces out, and the long (8-foot) edge is perpendicular to the roof trusses or rafters and spans a minimum of three supports. The short (4-foot) edge of the panel should be centered over a framing member and staggered a minimum of 24 inches from the adjacent panels.

Unsupported 7/16" ForceField Panels spanning more than 16" require panel edges blocked or H-clips installed midway between the roof trusses or rafters. Maximum allowable load of the roof for the given truss or rafter spacing does not increase by using edge supports.

Use a minimum 8d common nail spaced 6 inches o.c. along, 3/8 inch from all panel edges, and 12 inches o.c. at intermediate supports to ensure all design criteria and local building code requirements are met. If pneumatic nail guns are used, be sure to set air pressure to drive nail heads flush or a maximum 1/16 inch below the panel surface to avoid loss of nail holding and shear strength, and to avoid creating a potential point of water entry. Flush drive attachments are recommended when using a pneumatic nail gun. Guidelines are included on the panel surface to aid in locating supports for nailing.

Taping the Panel Seams

ForceField® Premium Tape from Georgia-Pacific must be used to seal the seams between sheathing panels. For best performance results, treat panel seams as soon as possible. Before the application of tape, ensure that the sheathing surfaces are free from frost, moisture, dust, dirt and other bond-inhibiting materials. Center the tape over the seam. ForceField Premium Tape is a contact tape requiring pressure to adequately seal. Apply firm pressure on the tape with your hand to ensure that a continuous bond is achieved between the tape and the panel surface, and to eliminate wrinkles and air bubbles. As a best practice, use a J-roller over the tape after hand application. Whenever tape splices occur, a 2-inch overlap should be used. Sequence tape application to ensure a shingle-type application. At T-joints, the tape should overlap by 2 inches.



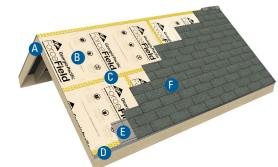
Sloped-Roof Applications

Important: Applications are presented for illustration only and may not be appropriate for all projects, conditions or components. Please consult an appropriate professional for design and detailing of the project. Georgia-Pacific does not provide roof design services.

Asphalt Shingles

Roofing system installed per manufacturer's instructions and local building code requirements.

- A. Roof Truss/Rafter
- B. ForceField® Panel
- C. ForceField® Premium Tape
- D. Drip Edge
- E. Starter Course/Strip
- F. Shingles
- G. Ice and Water Barrier if Required by Code (not shown)



For additional roof coverings, contact the Technical Services Hotline at the number or website below.



Delivery, Handling and Storage

All ForceField® Weather Barrier System materials will be delivered in their original bundles or packaging. The plastic packaging used to wrap wood sheathing products for rail and/or truck shipment is intended to provide temporary protection from moisture exposure during transit only and is not intended to provide protection during storage after delivery. Such plastic packaging must be removed immediately upon receipt of the shipment. Failure to remove protective plastic shipping covers can result in condensation, which can lead to damage.

Take precautions to protect panel ends and edges during shipment. If ForceField® Panels are shipped on open truck beds, cover them with a tarp.

Storage on the Jobsite

Whenever possible, store ForceField Panels under a roof. Use pieces of lumber to weigh down the top panel in a stack to reduce warpage from humidity. If moisture exposure is expected, cut steel bands on bundles to prevent edge damage.

Outside storage:

If ForceField Panels must be stored outside, stack them on a level platform supported by at least three 4x4s to keep them off the ground. Place one 4x4 in the center and the other two 12 to 16 inches from the ends. Never leave panels or the platform in direct contact with the ground. Cover the stacks loosely with plastic sheets or tarps. Anchor the covering at the top of the stack, but keep it open and away from the sides and bottom to ensure good ventilation. Tight coverings prevent air circulation and, when exposed to sunlight, may promote mold or mildew.

Accessory Storage

Store ForceField® Tapes in a dry, cool place out of direct sunlight. If stored properly:

- ForceField® Seam Tape has a shelf life of up to two years from the manufactured date.
- ForceField® Flex Tape has a shelf life of up to two years from the manufactured date.
- ForceField® Premium Tape has a shelf life of up to three years from the manufactured date.

10-Year Limited Warranty

Georgia-Pacific Building Products provides a limited warranty for the ForceField® Weather Barrier System as part of the original building envelope of a residential or commercial property. ForceField Weather Barrier System is resistant to normal weather conditions. It is not intended for use as a cladding system, long-term outdoor exposure or immersion in water. Water should always be directed away from the ForceField Weather Barrier System. ForceField Weather Barrier System may be exposed to normal weather conditions for up to 90 days in roof applications and 180 days in wall applications.

View full warranty information.



Use Recommendations and Limitations

The following recommendations and limitations are important to ensure the proper use and benefits of ForceField® Weather Barrier System. Failure to strictly adhere to such recommendations and limitations may void the limited warranty provided by Georgia-Pacific Building Products for such products. For details, please go to Warranty.GPForceField.com.

- ForceField Panels are intended for roofs with 2/12 pitch or greater.
- Do not install ForceField panels in contact with concrete, stone or masonry. Provide a minimum 1/2-inch gap. Use mortar control netting and keep mortar and mortar droppings from being in constant contact with ForceField panels.
- Do not install ForceField® Tapes in temperatures less than 20°F or if a panel surface has frost or ice.
- Where multiple layers of water-resistive barriers or underlayment are needed, ForceField Weather Barrier System may replace only the first layer.
- ForceField Weather Barrier System is not an ice barrier. Where ice barriers are required, the ice barrier should be installed over the ForceField Weather Barrier System.
- ForceField Tapes are not recognized as a replacement for rigid, metal or other roof/wall flashings prescribed by others.
- ForceField Weather Barrier System is resistant to normal weather conditions for up to 180 days for walls and 90 days for roofs. It is not intended for use as an ice barrier, finished roof covering or cladding system, long-term outdoor exposure or immersion in water. Water should always be directed away from the system.
- Avoid conditions that will create moisture in the air and condensation within the exterior walls or roof supports. This
 precaution is especially important during periods when the exterior and interior temperature differentials may result in
 condensation. The use of forced air heaters creates volumes of water that, when not properly vented, can condense on
 building materials. The use of heaters and any resulting damage is not the responsibility of Georgia-Pacific. Consult heater
 manufacturer for proper use and ventilation.
- Do not attach cement board panels directly to ForceField Panels. ForceField Weather Barrier System is not intended for interior applications or as a substrate for adhered exterior tile, stone or brick.
- Fasteners must be driven into framing and be flush with the face, not countersunk.
- Exterior wall or roof assembly design details including, but not limited to, cladding attachments, control joints, material transition details, window and door integration, and drainage establishment product, per the project specification, must be properly installed.
- Transitions and penetrations must be properly sealed, taped or flashed. Don't move or re-situate tape after initial placement.
- ForceField Panels should not be glued to framing members or roofing supports. Do not install ForceField Panels on a horizontal surface; ensure panels are sloped to prevent ponding and pooling.
- Do not install ForceField Weather Barrier System below grade. Terminate the system a minimum 6 inches above finished grade and a minimum 2 inches above hardscapes such as patios and sidewalks.
- All damages to the facer or vacated fastener holes must be repaired prior to installing the cladding or roofing system.
- When reroofing or replacing the roof or cladding system on an installed ForceField Weather Barrier System, an additional weather-resistant barrier or underlayment must be installed prior to installing the new roof assembly.
- Do not use solvent-based primers, cleaners, membranes or other products with ForceField Panels or ForceField Tapes.
- DensDefyTM Products and ForceField Tape are not intended to be used as a structural component of the exterior wall.
- DensDefy Products and ForceField Accessories are not to be used as through-wall flashing.
- DensDefy® Liquid Flashing and DensDefy® Transition Membrane should be applied in temperatures above 25°F (-4°C).
- DensDefy Transition Membrane is not intended for seismic joints. For Gaps wider than 1 inch, contact the Technical Services Hotline at the number or website below.
- For a full list of DensDefy Product limitations, refer to the product bulletins on DensElement.com.

Disclaimer: Georgia-Pacific does not warrant and is not responsible or liable for the performance of any cladding, roof, cladding system or roof assembly that is attached or adhered to the ForceField Weather Barrier System. The compatibility of any cladding system or roofing assembly is the responsibility of the cladding or roofing manufacturer or design authority.



SALES INFORMATION AND ORDER PLACEMENT

U.S.A.: 1-866-249-3639

TECHNICAL SERVICES HOTLINE

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





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WARRANTIES AND TERMS OF SALE – For current warranty information, please go to Warranty.GPForceField.com. All sales by Georgia-Pacific are subject to our Terms of Sale available at BuildGP.com/TC.

PRECAUTIONS – For product fire, safety and use information, go to BuildGP.com/SafetyInfo or call 1-800-225-6119.

HANDLING AND USE – Refer to SDS for instructions on safe handling and use of the product at: BuildGP.com/ForceField/Resources/Library.