

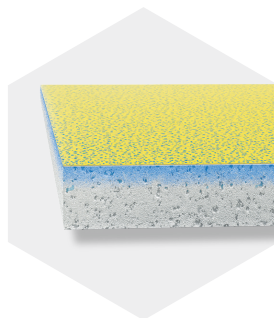
DensElement® Barrier System with Knight Wall ThermaStop™ Systems

TECHNOTES 002



DensElement® Barrier System

integrates a fiberglass gypsum mat sheathing panel with a water-resistant barrier and air barrier (WRB-AB). By filling microscopic voids in the glass mat and gypsum core via AquaKor™ Technology, a hydrophobic, monolithic surface is created that blocks bulk water while retaining vapor permeability, eliminating the need for a separate WRB-AB. The system is comprised of DensElement® Sheathing and a Georgia-Pacific (GP) approved fluid-applied flashing. When properly installed, and when the joints, fasteners, penetrations, openings, and materials are properly sealed with a GP-approved fluid-applied flashing (now including DensDefy™ Liquid Flashing), the DensElement Barrier System creates a vapor-permeable WRB-AB.



DensElement® Sheathing

is a mold-resistant panel made of fiberglass and gypsum, with the highest score of performance for mold resistance under ASTM D3273 test method. DensElement Sheathing exhibits dimensional stability providing for a flat and rigid substrate that is noncombustible, as defined and tested in accordance with ASTM E136 or CAN/ULC S114. It is generally the same strength in both directions and may be installed either parallel or perpendicular to wall framing members (always following specific wall assembly installation instructions as described in the DensElement Barrier System Technical Brochure).



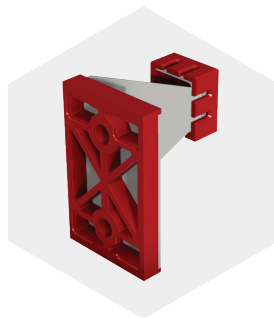
PROSOCO R-Guard® FastFlash®

is a silyl terminated polymer-based waterproofing, adhesive and detailing compound. ProsoCO R-Guard FastFlash produces a highly durable, seamless, elastomeric flashing membrane that bonds directly to damp or dry surfaces and cures under a variety of weather conditions. The liquid-flashing membrane can be used in rough openings and to treat joints, seams, and penetrations in new or existing wall assemblies to counter-flash waterproofing and air barrier components. FastFlash is an approved flashing component of the DensElement Barrier System, used in this test to create a vapor-permeable WRB-AB to prevent unwanted water and air movement through the building envelope.



The Knight Wall ThermaStop™ System

is a thermal isolation system comprised of durable steel coated in a zinc-aluminum-magnesium alloy with a durable polyoxymethylene plastic base and 1/8" plastic washer. The pre-assembled ThermaStop assembly includes an 1/8" plastic cap to isolate the stem of the wall bracket from the rail.



U.S.A. – Georgia-Pacific Gypsum, LLC
Canada – Georgia-Pacific Canada LP

SALES INFORMATION & ORDER PLACEMENT

U.S.A. Midwest: 1-800-876-4746

West: 1-800-824-7503

South: 1-800-327-2344

Northeast: 1-800-947-4497

CANADA Canada Toll Free:
1-800-387-6823

Quebec Toll Free: 1-800-361-0486

TECHNICAL INFORMATION

Georgia-Pacific Gypsum
Technical Hotline

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

DensElement.com

Testing

Georgia-Pacific Gypsum enlisted a third party to conduct a water penetration resistance test on DensElement Barrier System with Knight Wall ThermaStop Brackets. Intertek Building & Construction (B&C) conducted the test in accordance with ASTM E331-00(2016), *Standard Test Method for Water Penetration of Exterior Windows, Skylights, Doors, and Curtain Walls by Uniform Static Air Pressure Difference*.

Sustained, high volumes of water were shot at a test wall assembled using DensElement Barrier System with Knight Wall ThermaStop System with increasing pressure differentials created by pulling a vacuum on the back of the wall. The assemblies were tested with Knight Wall ThermaStop Brackets positioned both flush against the DensElement Barrier System as well as spaced away from the sheathing to allow for drainage.

The purpose of this high-stress water penetration test was to simulate typical wind-driven rainy weather conditions that buildings encounter during storms in the real world. Results showed the assembly's ability to prevent water from reaching the interior cavity, which demonstrates their capacity to stand strong against potential weather-related water leaks.

The test wall was constructed using 18ga steel studs spaced 16" on center. A sheet of nominal 5/8"-thick DensElement Sheathing was secured to the studs with #8 x 1-1/4" Philips Bugle-Head fine thread self-drilling drywall screws spaced 8" on the center. The wall utilized two 2'x8' Southern Yellow Pine boards on the jambs to facilitate the testing. All fasteners were spot-treated with PROSOCO R-Guard FastFlash Liquid Flashing. Each test used an overall area of 32 square feet, measuring 48" wide by 96" high.

The Knight Wall ThermaStop bracket anchors were attached to the DensElement Sheathing using two #10 x2-1/2" screws. Three Knight Wall brackets were attached flush to the sheathing. Then three additional brackets were attached utilizing a 1/16" inverted U-shaped shim installed between the sheathing face and the bracket to allow for drainage.

Results

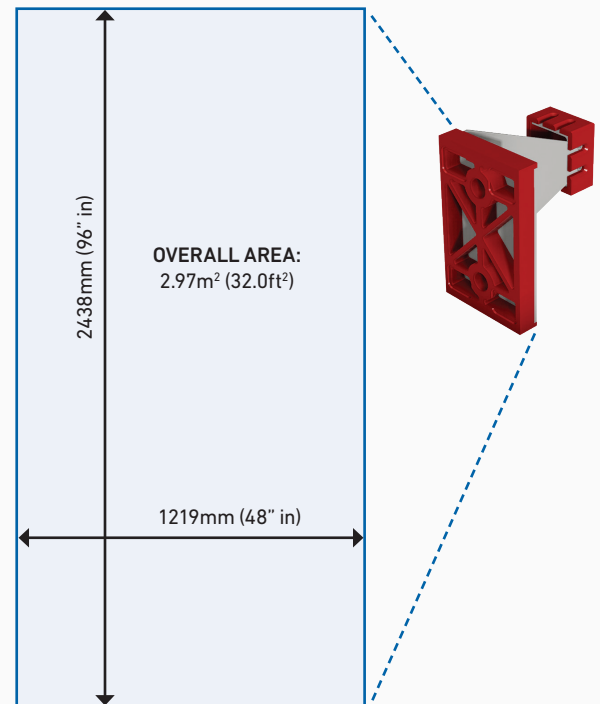
Withstanding water resistance under simulated severe weather conditions, the DensElement Barrier System and Knight Wall ThermaStop Bracket assembly passed the test—maintaining structural integrity. No leakage occurred under increasing uniform static air pressure differences from 137 to 900 Pa and increasing time durations from 15 to 30 minutes.

These findings show that wall assemblies constructed with DensElement® Barrier System, in conjunction with the tested cladding attachment system, provide excellent resistance against bulk water from wind-driven rain. When installed under GP Gypsum's guidelines, DensElement Barrier System's integrated AquaKor Technology provides a reliable weatherproofing solution, enabling water vapor to dissipate through the system rather than trapping it within the assembly.

Adding to the building envelope's ability to deflect wind-driven rain, real-world assemblies should include a cladding installed over the subframe. The drainage space that the subframes create between the sheathing and cladding would help to promote drainage and further mitigate the risks of bulk water entering the interior side of the wall assembly during a storm.

Follow the manufacturers' installation guidelines and specifications for proper design and use. Georgia-Pacific Gypsum does not provide engineering services. Proper design and performance criteria provided by other parties.

Knight Wall ThermaStop™ Bracket Size



Knight Wall ThermaStop™ Bracket Test Results

WATER PENETRATION TEST	RESULTS	ALLOWED
per ASTM E331 at 137 Pa (2.86 psf) for 15 minutes	Pass ✓	No leakage
per ASTM E331 at 300 Pa (6.27 psf) for 30 minutes	Pass ✓	No leakage
per ASTM E331 at 600 Pa (12.35 psf) for 30 minutes	Pass ✓	No leakage
per ASTM E331 at 900 Pa (18.80 psf) for 30 minutes	Pass ✓	No leakage

GENERAL NOTE: All testing was performed in accordance with the referenced standard(s). All pressures were run consecutively.

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