Georgia-Pacific

DensDefy™

Liquid Barrier

RIGOROUS TESTING. OPTIMAL PERFORMANCE.

ALL-IN-ONE WATER-RESISTIVE AND AIR BARRIER SOLUTION MET ALL OF THE CHALLENGES.

Understanding design considerations, limitations and realistic performance is critical for the successful deployment of any new product. The research and development teams at Georgia-Pacific recognize this as a risk potential and require scientific proof of success before introducing innovative new systems like DensDefy™ Liquid Barrier System. Rigorous testing of the various assemblies and the individual components of the system is a crucial step prior to a real-world launch. The following tables demonstrate only a sampling of the specific experiments performed on the system to replicate potential real-world exposure. This exhaustive testing resulted in the evidence needed for the International Code Council to identify and present the DensDefy Liquid Barrier System as a combination water-resistive and air barrier (WRB/AB) system.

DENSDEFY™ LIQUID BARRIER SYSTEM TESTING

TEST	DESCRIPTION	MEETS OR EXCEEDS	RESULTS
DensDefy™ Liquid Barrier Testing in Accordance with ICC-ES AC212			
ASTM C297 Standard Test Method for Flatwise Tensile Strength of Sandwich Construction	Provides information on the strength and quality of core-to-facings bonds; Pull strength must meet 15 psi	✓	Exceeds 15 psi on: OSB, Plywood, DensGlass and concrete substrates
ASTM D2247 Standard Practice for Testing Water Resistance of Coatings in 100% Relative Humidity	Water resistance tested over a treated joint for 24 hours per day for 14 days at 100% relative humidity and 100^{0}F	✓	No signs of cracking, crazing, blistering, erosion or other deleterious effects were observed
Freeze – Thaw Testing per ICC-ES AC212 Water-Resistive Coatings Used as Water-Resistive Barriers Over Exterior Sheathing	Samples subjected to 10 freeze-thaw cycles with temperatures ranging from -20^{0}F to 120^{0}F; this is a pass/fail test	✓	No cracking, checking, crazing, erosion, delamination or other deleterious effects were observed
ASTM E96 Standard Test Method for Water Vapor Transmission of Materials	Obtain reliable values of water vapor transfer through permeable and semipermeable materials, expressed in suitable units	✓	**14 Perms** System has high vapor permeability. Tested using the Wet Cup Method to measure weight loss due to water vapor from the cup transmitting through the material to the test atmosphere and humidity of the test chamber.
ASTM E331 Standard Test Method for Water Penetration of Exterior Windows, Skylights, Doors and Curtain Walls by Uniform Static Air Pressure Difference	Water penetration testing of the assembly	✓	**No leaks!**
ASTM E331	ASTM E331 is performed twice in ICC-ES AC 212. First as a stand-alone test, and then ASTM E331 is the final stage of a 4-stage event performed on the same assembly. In this 4-stage event, water penetration was tested after the DensDefy™ Liquid Barrier System was subjected to three other test methods—loading, racking and environmental conditioning—as described below.		
STAGE 1 **ASTM E1233** Standard Test Method for Structural Performance of Exterior Windows, Doors, Skylights and Curtain Walls by Cyclic Air Pressure Differential	The first stage of conditioning for the ASTM E331 test – transverse load testing (panel deflection test); no failure of WRB allowed; this is a pass/fail test	✓	**No WRB failure!** Per IBC code requirements, DensDefy Liquid Barrier System endured 10 specified deflection cycles with no WRB failure. (Procedure A was utilized as modified by Section 4.7.1 of ICC-ES AC212.)
STAGE 2 **ASTM E72** Standard Test Methods of Conducting Strength Tests of Panels for Building Construction	The second stage of conditioning for the ASTM E331 test – racking test (panel strength test); no failure of WRB allowed during or after racking; this is a pass/fail test	✓	**No WRB failure!** System was racked at 1/8" net deflection
STAGE 3 **Restrained Environmental Conditioning of Panel with WRB/AB**	The third stage of conditioning for the ASTM E331 test – system subjected to water and heat after being deflected and racked; no failure of WRB allowed; this is a pass/fail test	✓	**No WRB failure!** System subjected to 5 cycles of 24-hour water spray and 24-hour radiant heat on panels that were tested structurally
STAGE 4 **ASTM E331** Standard Test Method for Water Penetration of Exterior Windows, Skylights, Doors and Curtain Walls by Uniform Static Air Pressure Difference	The final stage of testing using the assembly that has already undergone stages 1-3 testing; the system was then tested to determine its resistance to water penetration under uniform static air pressure differences	✓	**No leaks!** Water penetration was conducted on the specimen in accordance with ASTM E 331-00 as modified by Section 4.7.4 of ICC-ES AC212
Hydrostatic Pressure Test (3-Stage) per ICC-ES AC212	In this 3-stage event, hydrostatic pressure was tested after the DensDefy™ Liquid Barrier System was subjected to two other test methods—UV light exposure and accelerated aging—as described below.		
STAGE 1 **Ultraviolet (UV) Light Exposure**	The first stage of conditioning for the hydrostatic head test – a sample with a joint was exposed to high heat for an extended period; this is a pass/fail test	✓	**No WRB failure!** Specimens were exposed to UV lamps for 10 hours per day for 21 days at a specimen temperature of 135-140°F using GE Type H272 RUV (275 W) bulbs with 5.0 W/m2-nm at a wavelength of 315-400 nm at 1 m
STAGE 2 **Accelerated Aging**	The second stage of conditioning for the hydrostatic head test – the previous sample with a joint was taken from the UV exposure test and subjected to 25 accelerated aging cycles	✓	**No WRB failure!** Specimens were exposed to 25 cycles as follows: 1. 120°F for three (3) hours 2. Immersion of coating surface for three (3) hours 3. And then air-dried for 18 hours at ambient lab conditions
STAGE 3 **Hydrostatic Pressure Test per AATCC Test Method 127-98** for Water Resistance	The final stage of testing uses the samples that have already undergone stages 1-2; the system was then tested for leakage and to verify performance and durability	✓	**No leaks!** Specimens were tested in accordance with AATCC-127-98 for hydrostatic resistance using a 55 cm head of water for a minimum period of five (5) hours

DENSDEFY™ LIQUID BARRIER SYSTEM TESTING			
TEST	**DESCRIPTION**	**MEETS OR EXCEEDS**	**RESULTS**
Additional Testing for ABAA Material/System Evaluation			
ASTM E2178 Standard Test Method for Air Permeance of Building Materials	Measurement of the air permeance of flexible sheet or rigid panel-type materials; results may be useful in determining suitability of that material as a component of an air retarder system	✓	Exceeded IECC requirements for material air permeance
Hydrostatic Pressure Test per AATCC Test Method 127 for Water Resistance	System was then tested for water resistance	✓	**No leaks!**
ASTM D1970 Standard Specification for Self-Adhering Polymer Modified Bituminous Sheet Materials Used as Steep Roofing Underlayment for Ice Dam Protection	ASTM D1970, is to confirm DensDefy™ Liquid Barrier System meets a waterproofing standard by laying it flat, driving two nails into it, and backing out the nails a quarter of an inch. The bottom is cut out of a one gallon can, and itis sealed with silicone around the two nails. Water is added to the can, and it is left for a period of time.	✓	No leaks allowed where fasteners penetrate through specimen. Pass.
ASTM D4541 Standard test method for pull-off strength of coatings	This test method is used to evaluate the pull-off strength of air barrier membranes.	✓	Exceeds minimum 16 psi pull-off requirement
ASTM C1305 Low Temperature Crack Bridging	Test indicates a WRB's ability to bridge preexisting substrate cracks at low temperatures.	✓	No cracking, splitting, pinholes or other conditions at the joints in the substrate
ASTM E2357 Standard Test Method for Determining Air Leakage of Air Barrier Assemblies	Simulates the performance of various air barrier materials/accessories when combined into an assembly; results will assign an air leakage rating for the assembly	✓	Exceeded IECC requirements for assembly
DensDefy™ Liquid Barrier Additional Testing			
ASTM E84 Standard Test Method for Surface Burning Characteristics of Building Materials	Provides comparative measurements of surface flame spread and smoke density measurements with that of select fiber cement board surfaces under specific fire exposure conditions	✓	Class A rating 25 - Flame Spread 10 - Smoke Developed

CODE COMPLIANCE

DensDefy™ Liquid Barrier System conforms to the requirements as a water-resistive barrier and air barrier with the codes listed below as documented in ICC-ES ESR-4708 by meeting established water-resistive barrier and air-barrier acceptance criteria.

- 2021, 2018, 2015 and 2009 International Building Code® (IBC)
- 2021, 2018, 2015, 2012 and 2009 International Residential Code® (IRC)
- 2021, 2018, 2015 and 2009 International Energy Conservation Code® (IECC)
- 2019 California Green Building Standards Code (CALGreen), Title 24, Part 11
- 2018, 2015 and 2012 International Green Construction Code® (IgCC)
- 2017, 2014 and 2011 ANSI/ASHRAE/USGBC/IES Standard 189.1- Standard for the Design of High-Performance Green Buildings, Except Low-Rise Residential Buildings
- 2020, 2015, 2012 and 2008 ICC 700 National Green Building Standard™ (ICC 700-2020, ICC 700-2015, ICC 700-2012 and ICC 700-2008)
- 2021 City of Los Angeles Building Code (LABC) 2021 City of Los Angeles Residential Building Code (LARC)
- DensDefy Liquid Barrier System installed as a water-resistive barrier and an air barrier material, is recognized for use on Types I, II, III, IV and Type V construction. When used on exterior walls of buildings greater than 40 feet above grade in Types I, II, III or IV construction under the 2021, 2018 and 2015 IBC, installation must comply with Exception 1 of 2021 and 2018 IBC Section 1402.5 (2015 IBC Section 1403.5).

DensDefy Liquid Barrier System has been evaluated as an air barrier by the Air Barrier Association of America (ABAA).

Fire Resistance/NFPA 285

DensDefy Liquid Barrier System is NFPA 285 compliant with multiple assemblies that hold an ICC-ES Evaluation Report including Brick, Stucco, Metal Panel, and other claddings.

Georgia-Pacific
Building Products

U.S.A. GP Gypsum LLC
CANADA Georgia-Pacific Canada LP

SALES INFORMATION AND ORDER PLACEMENT

U.S.A.	Pacific Southwest:	**1-800-824-7503**
	Midwest:	**1-800-876-4746**
	Central:	**1-800-231-6060 x7709**
	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: **800-225-6119**

WARRANTIES AND TERMS OF SALE – For current warranty information, please go to buildgp.com/warranties and select the applicable product. All sales by Georgia-Pacific are subject to our Terms of Sale available at buildgp.com/tc.

CAUTION – 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 here: msds.gp.com.

07/21. Lit num#: 623070