SECTION 07 2500

GYPSUM BOARD WEATHER-RESISTANT BARRIER AND AIR BARRIER SYSTEM

**PART 1 GENERAL**

1. SECTION INCLUDES
	1. Work of this section includes coated fiberglass-mat gypsum sheathing board system with integral weather-resistant barrier (WRB) and air barrier (AB) features, and all accessory materials required for covering sheathing joints, fasteners, penetrations, rough openings, and material transitions, for use under exterior wall claddings.
	2. Fluid-applied membrane air barrier

**Specifier: The DensElement™ Barrier System specified herein replaces all exterior wall sheathing, plastic sheet air barriers, self-adhering air barriers and fluid-applied air barriers. Therefore, delete all other air barriers / weather resistant barrier products from the specifications, and delete exterior wall sheathing from Division 6.**

1. RELATED SECTIONS
	1. [Section 014000 Quality Requirements;] [Section 014529 Testing Laboratory Services;] [Section 014533 Code-Required Special Inspections and Procedures;] coordination with owners’ independent testing and inspection agency
	2. Section 014339 Mock-Ups; exterior wall mock-ups
	3. Section 054000 Cold-Formed Metal Framing
	4. Section 061000 Rough Carpentry
	5. Section 079200 Joint Sealants; sealant materials and installation techniques
	6. Section 092900 Gypsum Board
	7. Exterior wall claddings
2. DEFINITIONS
	1. Air Barrier (AB): Air tight barrier made of material that is relatively air impermeable but moisture vapor permeable, with sealed joints and penetrations, and with terminations sealed to adjacent surfaces.
	2. Weather-Resistant Barrier (WRB): Water-shedding barrier made of material that is moisture-resistant, installed to shed water, with sealed joints and penetrations, and with terminations sealed to adjacent surfaces.
	3. Rough Openings: Openings in the wall to accommodate windows and doors.
	4. Material Transitions: Areas where the WRB / AB coated fiberglass-mat gypsum sheathing connects to beams, columns, slabs, parapets, foundation walls, roofing systems, and at the interface of dissimilar materials.
3. REFERENCE STANDARDS
	1. ASTM C473 Standard Test Method for Physical Testing of Gypsum Panel Products.
	2. ASTM C1177 Standard Specification for Glass Mat Gypsum Substrate for Use as Sheathing.
	3. ASTM C1280 Standard Specification for Application of Gypsum Sheathing.
	4. ASTM D3273 Standard Test Method for Resistance to Growth of Mold on the Surface of Interior Coatings in an Environmental Chamber.
	5. ASTM E72 Standard Test Methods of Conducting Strength Tests of Panels for Building Construction.
	6. ASTM E96 Standard Test Methods for Water Vapor Transmission of Materials.
	7. ASTM E119 Standard Test Method for Fire Tests of Building Construction and Materials.
	8. ASTM E136 Standard Test Method for Behavior of Materials in a Vertical Tube Furnace at 750 C.
	9. ASTM E84 Standard Test Method for Surface Burning Characteristics of Building Materials.
	10. ASTM E2178 Standard Test Method for Air Permeance of Building Materials.
	11. ASTM E2357 Standard Test Method for Determining Air Leakage of Air Barrier Assemblies.
	12. ICC ES AC212 Acceptance Criteria for Water-Resistive Coatings Used as Water-Resistive Barriers over Exterior Sheathing.
	13. AAMA 714 Voluntary Specification for Liquid Applied Flashing Used to Create a Water Resistive Seal Around Exterior Wall Openings in Buildings.
4. SUBMITTALS
	1. Submittals: Submit in accordance with Division 1 requirements.
	2. Product Data and Installation Instructions: Submit manufacturer’s product data including sheathing and accessory material types, composition, descriptions and properties, installation instructions and substrate preparation recommendations.
	3. Shop Drawings: Submit shop drawings indicating locations and extent of WRB / AB system, including details of typical conditions, special joint conditions, intersections with other building envelope systems and materials; counter flashings and details showing bridging of envelope at substrate changes, details of sealing penetrations, and detailed flashing around windows and doors
	4. Test Reports: Submit test reports indicating compliance with specified performance characteristics and requirements
	5. Sample warranty: Submit a sample warranty identifying the terms and conditions of the warranty as herein specified.
	6. Evaluation reports: Accredited laboratory testing for materials
5. WARRANTY
	1. Provide manufacturer’s standard warranty against in-place exposure damage (delamination, deterioration) for 12 (twelve) months of exposure to normal weather conditions beginning with the date of installation of the product.
	2. Provide manufacturer's standard warranty for sheathing to be free of manufacturing defects that make it unsuitable for its intended use. Warranty period shall be Ten (10) years from the date of purchase of the product.
	3. Provide manufacturer’s standard warranty for use as a drainage plane when the cladding systems are properly designed and installed, with a warranty period of 10 years from the date of purchase of the product or, when used as a substrate in architecturally specified drainage EIFS, 12 years from the date of purchase of the product..
	4. Material Warranty: Provide material manufacturer’s standard product warranty, for a minimum three (3) years from date of Substantial Completion. SPEC NOTE: VERIFY WARRANTY LENGTH WITH MANUFACTURERS SPECIFIED
6. QUALITY ASSURANCE- MOCK UP
	1. Install WRB / AB sheathing with sealed joints and penetrations in mock-up as specified in [Section 014339 Mock-Ups.] [Section \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_].
7. DELIVERY, STORAGE, AND HANDLING
	1. Store WRB / AB coated fiberglass mat gypsum sheathing under cover and keep dry and protected against weather, condensation, direct sunlight, construction traffic, and other potential causes of damage. Stack sheathing flat and supported on risers on a flat platform to prevent sagging.
	2. Protect fluid applied material, primers and accessory materials from damage, weather, excessive temperatures and construction traffic.
	3. Store fluid applied material and primers at temperatures of 40 degrees F or above.

D. Apply fluid applied material to clean surfaces free of contaminants. Chemical residues, surface coatings or films may adversely affect adhesion. Pressure-treated wood and other contaminated surfaces should be cleaned with a solvent wipe before application.

1. FIELD CONDITIONS
	1. Application standards where applicable are in accordance with Gypsum Association Publication GA-253 for gypsum sheathing and ASTM C1280.
	2. Do not install sheathing that is moisture damaged. Indications that panels are moisture damaged include, but not limited to, discoloration, sagging, or irregular shape.
	3. Allow installed sheathing to be dry to the touch before sealing joints, penetrations, rough openings, and material transitions.
	4. Do not attempt to seal joints, corners, penetrations, rough openings, and material transitions when installed sheathing surface is frozen or has frost on the surface.
	5. Do not apply sealing materials to sheathing when air or surface temperature is below 25F for fluid applied materials.
	6. Sequencing. Do not install air barrier material before the roof assembly has been sufficiently installed to prevent a buildup of water in the interior of the building.
	7. Compatibility. Do not allow air barrier materials to come in contact with chemically incompatible materials.
	8. Ultra-violet exposure. Do not expose air barrier materials to sunlight longer than as recommended by the material manufacturer.

**PART 2 PRODUCTS**

1. WEATHER BARRIER ASSEMBLIES
	1. Acceptable products: DensElement Barrier System as manufactured by Georgia-Pacific Gypsum LLC.
		1. Sheathing: DensElement Sheathing.
		2. Fluid-applied flashing materials: Fluid-applied flashing as approved by Georgia-Pacific Gypsum LLC.
		3. Primers, backer rods and accessory materials: As approved by Georgia-Pacific Gypsum LLC.
	2. System Description: Weather-Resistant Barrier and Air Barrier assembly installed at exterior stud walls under exterior cladding, consisting of the following components as herein specified:
		1. Sheathing: WRB / AB coated fiberglass mat gypsum sheathing.
		2. Fluid-applied flashing to seal sheathing joints, inside and outside corners, penetrations, rough openings, and material transitions.
		3. Backer rods and accessory materials.

2.2 WEATHER-RESISTANT BARRIER (WRB) AND AIR BARRIER (AB) GYPSUM

SHEATHING

 A. Description: Coated fiberglass mat gypsum sheathing with integral weather-resistant barrier (WRB) and air barrier (AB) complying with applicable requirements of ICC- ES AC212, ASTM E2178, ASTM E2357.

 B. Vapor Permeability: When tested as system in accordance with ASTM E96

 (water method) the WRB and AB system has a minimum vapor permeance of 20

 perms with sealed joints and fasteners.

* 1. The WRB and Air Barrier Gypsum Sheathing has a moisture absorption rate < 6%

 D. Air Barrier performance requirements:

* + 1. Air permeance of sheathing: Sheathing with an air permeability not greater than 0.001 cfm/ft2 (0.02L/s/m2) when tested in accordance with ASTM E2178.
		2. Air permeance of assembly: Assembly of sheathing and sealing components with an average air leakage not greater than 0.04 cfm/ft2 (0.2L/s/m2) when tested in accordance with ASTM E2357.

2.3 FLUID-APPLIED FLASHING AND ACCESSORY MATERIALS FOR JOINTS, INSIDE AND OUTSIDE CORNERS, FASTENERS, ROUGH OPENINGS, AND MATERIAL TRANSITIONS

* 1. Substrate requirements:
		1. Sheathing panels should be trimmed to obtain neat fitting joints.
		2. Gaps that are more than 1/4” and less than 1” shall be filled with a backer rod to support the fluid applied flashing at the transition joint.
		3. For gaps larger than 1" use transition membrane flashing as approved by Georgia-Pacific Gypsum LLC.
	2. Fluid applied flashing for panel joints, inside and outside corners, and penetrations
		1. Description: STP-based fluid applied flashing.
		2. Properties:
			1. Acceptable substrate: Georgia-Pacific Gypsum LLC DensElement Sheathing.
			2. Adhesion to fiberglass mat faced sheathing: No delamination from face of sheathing.
			3. Applied wet film thickness: 16 mils.
			4. Air permeance: meets 0.004 cubic feet per minute per square foot (0.02L/s/sq m), maximum, when tested in accordance with ASTM E2178.
			5. Water vapor permeance: >10 perms (287 ng/(Pa s sq m)), minimum, when tested in accordance with ASTM E96/E96M.
			6. Ultraviolet and weathering resistance: Approved for 12 months weather exposure.
			7. Comply with applicable requirements of AAMA 714
		3. Primer: Provide primer in accordance with air barrier manufacturer's written instructions for exposed gypsum core edges.
	3. Fluid applied flashing for sealing fasteners:
		1. Description: STP-based fluid applied flashing.
		2. Properties:
			1. Acceptable substrate: Georgia-Pacific Gypsum LLC DensElement Sheathing.
			2. Adhesion to fiberglass mat faced sheathing: No delamination from face of sheathing.
			3. Applied wet film thickness: 16 mils.
			4. Air permeance: meets 0.004 cubic feet per minute per square foot (0.02 L/s/sq m), maximum, when tested in accordance with ASTM E2178.
			5. Water vapor permeance: >10 perms (287 ng/(Pa s sq m)), minimum, when tested in accordance with ASTM E96/E96M.
			6. Ultraviolet and weathering resistance: Approved for 12 months weather exposure.
			7. Comply with applicable requirements of AAMA 714.
	4. Fluid applied flashing for sealing rough openings
		1. Fluid applied flashing: STP-based fluid applied flashing.
		2. Primer: Liquid primer in accordance with air barrier manufacturer's written instructions for exposed gypsum core edges. Apply primer to raw gypsum board edges by brushing on a thin, uniform coat.
		3. Properties:
			1. Acceptable substrate: Georgia-Pacific Gypsum LLC DensElement Sheathing.
			2. Flashing adhesion to fiberglass mat faced sheathing: No delamination from face of sheathing.
			3. Applied wet film thickness: 16 mils.
			4. Flashing air permeance: meets 0.004 cubic feet per minute per square foot (0.02 L/s/sq m), maximum, when tested in accordance with ASTM E2178.
			5. Flashing water vapor permeance: >10 perms (287 ng/(Pa s sq m)), minimum, when tested in accordance with ASTM E96/E96M.
			6. Ultraviolet and weathering resistance: Approved for 12 months weather exposure.
			7. Flashing comply with applicable requirements of AAMA 714.
	5. Material transitions using fluid applied flashing:
		1. Refer to substrate requirements for treatment of gaps as specified herein. Gaps that are more than 1/4” and less than 1” shall be filled with a backer rod to support the fluid applied flashing at the transition joint. For gaps larger than 1" use transition membrane flashing as approved by Georgia-Pacific Gypsum LLC
		2. Fluid applied flashing for material transitions:
		3. Properties:
			1. Acceptable substrate: Georgia-Pacific Gypsum LLC DensElement Sheathing.
			2. Adhesion to fiberglass mat faced sheathing: No delamination from face of sheathing.
			3. Applied wet film thickness: 16 mils
			4. Air permeance: 0.004 cubic feet per minute per square foot (0.02L/s/sq m), maximum, when tested in accordance with ASTM E2178
			5. Water vapor permeance: >10 perms (287 ng/(Pa s sq m)), minimum, when tested in accordance with ASTM E96/E96M
			6. Ultraviolet and weathering resistance: Approved for 12 months weather exposure
			7. Comply with applicable requirements of AAMA 714

**PART 3 EXECUTION**

1. PREPARATION
	1. Remove projections, protruding fasteners, loose or damaged sheathing material at edges of panel that might interfere with proper installation to seal joints, corners, fasteners, penetrations, openings, or material transitions.
	2. Wipe down the sheathing surface to receive sealing materials with a clean cloth.
	3. Ensure field conditions are met as outlined in Part 1 – General Requirements.
2. INSTALLATION OF WEATHER-RESISTANT BARRIER (WRB) AND AIR BARRIER (AB) SHEATHING
	1. WRB / AB Coated fiberglass mat sheathing:
		1. Install and fasten DensElement Sheathing according to manufacturer’s detailed installation instructions
		2. Fastener and penetration treatment: Treat all sheathing fasteners with specified fluid applied flashing used for sealing joints.
3. FLUID APPLIED FLASHING FOR SEALING SHEATHING JOINTS, INSIDE AND OUTSIDE CORNERS, FASTENERS, ROUGH OPENINGS, AND MATERIAL TRANSITIONS
	1. Sealing DensElement Sheathing Joints using specified Fluid Applied Flashing
		1. Apply fluid applied flashing over the joint in a zigzag or ribbon pattern. Cover a minimum of 1” on both sides of the joint.
		2. With a straight edge tool, spread evenly over the sheathing joint.
		3. Apply at a rate to achieve a minimum wet mil thickness of 16 mils over the entire joint area.
	2. Sealing DensElement Sheathing Vertical Corners using specified Fluid Applied Flashing
		1. Apply fluid applied flashing over the inside and/or outside corner in a zigzag or ribbon pattern. Cover a minimum of 2” on both sides of the corner.
		2. With a straight edge tool, spread evenly over the sheathing corner.
		3. Apply at a rate to achieve a minimum wet mil thickness of 16 mils over the corner area.
	3. Sealing DensElement Sheathing Fasteners using specified Fluid Applied Flashing: Apply the fluid applied flashing material to fasteners and wipe down with a straight edge tool; provide a minimum 16 mil thick coating over the fastener.
	4. Sealing DensElement Sheathing Rough Openings using specified Fluid Applied Flashing
		1. Apply a bead of DensDefy™ Liquid Flashing into all inside corners of the opening.
		2. Apply DensDefy™ Liquid Flashing in the opening sill, jamb and header in a zig-zag or ribbon pattern.
		3. Apply DensDefy™ Liquid Flashing over the DensElement Sheathing adjacent to the opening sill, jamb and header in a zig-zag or ribbon pattern.
		4. Use a straight edge tool to spread the DensDefy™ Liquid Flashing to a pinhole void free application achieving a minimum 16 wet mils
		5. Spread the DensDefy™ Liquid Flashing a minimum of 2” into the rough opening and a minimum 1” past the interior air seal of the window unit. Refer to the project details and specifications to determine window placement and minimum requirement for rough opening treatment.
		6. Ensure a minimum 2” of DensDefy™ Liquid Flashing is applied onto the sheathing surface adjacent to the opening.
	5. Sealing DensElement sheathing material transitions using specified Fluid Applied Flashing
		1. Sheathing joint and transition gaps to receive fluid-applied flashing shall be less than 1/4" (6.4 mm).
		2. For gaps larger than 1/4" use shall be sealed with fluid-applied flashing as approved by Georgia-Pacific Gypsum, LLC
		3. Gaps that are more than 1/4” and less than 1” shall be filled with a backer rod to support the fluid applied flashing at the transition joint.
		4. If necessary, prime the adjacent material with primer per the material manufacturer’s recommendations.
		5. Apply fluid applied flashing over the sheathing and adjacent material in a zigzag or ribbon pattern. Ensure the flashing is a minimum of 2” on each substrate material surface.
		6. With a straight edge tool, spread fluid applied flashing over material transition joint.
		7. Apply at a rate to achieve a minimum wet mil thickness of 16 mils.
4. SEALING EXTERIOR WALL PENETRATIONS
	1. Exterior wall penetration shall be sealed to prevent air and water infiltration. Penetrations may be sealed with fluid applied flashing.
	2. For round or square pipe/duct penetrations use specified fluid applied flashing, refer to DensElement Barrier System Technical Guide for instructions for proper sealing.
5. FIELD QUALITY CONTROL
	1. Do not cover installed WRB / AB assembly until required inspections have been completed and installation has been accepted.
	2. Where applicable, allow for owner’s inspection and air barrier testing and reporting.
6. PROTECTION
	1. Protect WRB / AB assembly from damage during installation and during the construction period.

 END OF SECTION