SECTION 072500

**Weather barriers**

Vycor enV® Guide Specifications

PART 1 — GENERAL

1.01 RELATED DOCUMENTS

A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and Division 1 Specification Sections, apply to this Section.

1.02 SUMMARY

A. This Section includes the following:

1. Materials and installation methods for fluid applied weather barrier system.

2. Materials and installation methods to seal pathways in roof and foundation junctions, window and door openings and other penetrations through the wall assembly.

B. Related Sections include the following:

1. Section 03300 – Cast-In-Place Concrete

2. Section 04810 – Unit Masonry Assemblies

3. Section 06161 - Gypsum Sheathing

7. Section 07620 – Sheet Metal Flashing and Trim

8. Section 07920 – Joint Sealants

1.03 PERFORMANCE REQUIREMENTS

A. General: Weather barrier shall be capable of performing as a continuous vapor-permeable weather barrier and as a liquid-water drainage plane flashed to discharge to the exterior incidental condensation or water penetration.

 The weather barrier shall have the following characteristics:

1. It must form a continuous coating that is fully adhered to the substrate

2. It shall have an air permeability not to exceed 0.0004 cfm/sq. ft. of surface area (at specified thickness) at 1.57-lbf/sq. ft. pressure difference (0.002 L/s x sq. m of surface area at 75-Pa)

3. It shall be capable of withstanding positive and negative combined design wind, fan and stack pressures on the envelope without damage or displacement, and shall transfer the load to the structure. It shall not displace adjacent materials under full load.

4. It shall be durable or maintainable.

5. The weather barrier shall be joined in an airtight and flexible manner to the weather barrier material of adjacent systems, allowing for the relative movement of systems due to thermal and moisture variations and creep. Connection shall be made between:

a. Foundation and walls.

b. Walls and windows or doors.

c. Different wall systems.

1. Wall and roof.

e. Wall and roof over unconditioned space.

f. Walls, floor and roof across construction, control and expansion joints.

g. Walls, floors and roof to utility, pipe and duct penetrations.

6. All penetrations of the weather barrier and paths of air infiltration/exfiltration shall be made airtight.

1.04 REFERENCES

A. The following standards and publications are applicable to the extent referenced in the text. The most recent version of these standards is implied unless otherwise stated.

1. American Society for Testing and Materials (ASTM)
	1. C297-04 Standard Test Method for Flatwise Tensile Strength of Sandwich Constructions
	2. E72-02 Standard Test Methods of Conducting Strength Tests of Panels for Building
	3. E96-00 Standard Test Method for Water Vapor Transmission of Materials
	4. E331-00 Standard Test Method for Water Penetration of Exterior Windows, Skylights, Doors, and Curtain
	 Walls by Uniform Static Air Pressure Difference
	5. E1233-97 Standard Test Method for Structural Performance of Exterior Windows, Curtain Walls, and Doors by

 Cyclic Static Air Pressure Differential

* 1. E283-04 Standard Test Method for Determining Rate of Air Leakage Through Exterior Windows, Curtain Walls, and Doors Under Specified Pressure differences Across the Specimen
	2. D2247-97 Standard Practice for Testing Water Resistance of Coatings in 100% Relative Humidity
	3. D412 Die C Standard Test Methods for Vulcanized Rubber and Thermoplastic Elastomers—Tension
	4. D3330-04 Standard Test Method for Peel Adhesion of Pressure-Sensitive Tape
	5. AATCC (127-1985) Water Resistance: Hydrostatic Pressure Test

1.05 SUBMITTALS

A. Product Data: Include manufacturer's written instructions for evaluating, preparing, and treating substrate; technical data; and tested physical and performance properties of air barrier.

B. Shop Drawings: Show locations and extent of air barrier. Include details for substrate joints and cracks, counterflashing strip, penetrations, inside and outside corners, terminations, and tie-ins with adjoining construction.

1. Include details of interfaces with other materials that form part of weather barrier.

2. Include details of mockups.

C. Samples: Submit representative samples of the following for approval:

1. Fluid applied membrane

2. Joint tape

3. Transition/flashing membrane

D. Product Certificates: For weather barriers, certifying compatibility of weather barrier and accessory materials with project materials that connect to or that come in contact with the barrier; signed by product manufacturer.

E. Qualification Data: For Applicator.

F. Product Test Reports: Based on evaluation of comprehensive tests performed by a qualified testing agency, for weather barriers, submit certified test report showing compliance with requirements specified under sections 3 and 4 of ICC AC 212 (Acceptance Criteria for Water Resistive Coatings Used as Water Resistive Barriers Over Exterior Sheathing) when applied to plywood and oriented strand board sheathing.

G. Warranty: Submit a sample warranty identifying the terms and conditions stated in Article 1.09.

1.06 QUALITY ASSURANCE

A. Manufacturer: Weather Barrier systems shall be manufactured and marketed by a firm with a minimum of 20 years experience in the production and sales of waterproofing, air barriers and weather barriers. Manufacturers proposed for use, but not named in these specifications shall submit evidence of ability to meet all requirements specified, and include a list of projects of similar design and complexity completed within the past five years.

1. Source Limitations: Obtain primary weather barrier material and flashing through one source from a single manufacturer.
2. Applicator Qualifications: A firm experienced in applying air barrier materials similar in material, design, and extent to those indicated for this project, whose work has resulted in applications with a record of successful in-service performance.

D. Mockups: Before beginning installation of weather barrier, provide weather barrier work for exterior wall assembly mockups, incorporating backup wall construction, external cladding, window, door frame and sill, insulation, and flashing to demonstrate surface preparation, crack and joint treatment, and sealing of gaps, terminations, and penetrations of weather barrier membrane.

1. Coordinate construction of mockup to permit inspection by Owner's testing agency of air barrier before external insulation and cladding is installed.

2. If Architect determines mockups do not comply with requirements, reconstruct mockups and apply weather barrier until mockups are approved.

E. Pre-Installation Conference: A pre-installation conference shall be held prior to commencement of field operations to establish procedures to maintain optimum working conditions and to coordinate this work with related and adjacent work. Preinstallation conference shall include the Contractor, installer, Architect, and system manufacturer's field representative. Agenda for meeting shall include but not be limited to the following:

1. Review of submittals.

2. Review of surface preparation, minimum curing period and installation procedures.

3. Review of special details and flashings.

4. Sequence of construction, responsibilities and schedule for subsequent operations.

5. Review of mock-up requirements.

6. Review of inspection, testing, protection and repair procedures.

1.07 DELIVERY, STORAGE, AND HANDLING

A. Deliver materials and products in labeled packages. Store and handle in strict compliance with manufacturer’s instructions, recommendations and material safety data sheets. Protect from damage from sunlight, weather, excessive temperatures and construction operations. Remove damaged material from the site and dispose of in accordance with applicable regulations.

B. Do not double-stack pallets of fluid applied membrane components on the job site. Provide cover on top and all sides, allowing for adequate ventilation.

C. Protect fluid-applied membrane components from freezing and extreme heat.

D. Sequence deliveries to avoid delays, but minimize on-site storage.

1.08 PROJECT CONDITIONS

A. Environmental Limitations: Apply weather barrier within the range of ambient and substrate temperatures recommended by weather barrier manufacturer. Protect substrates from environmental conditions that affect performance of the weather barrier. Do not apply weather barrier to a wet substrate or during snow, rain, fog, or mist.

1.09 WARRANTY

A. Material Warranty: Manufacturer's standard form in which manufacturer agrees to replace fluid-applied weather barrier membrane materials, if found defective in material or workmanship within specified warranty period when installed and used in strict conformance with written manufacturer's instructions.

1. Warranty Period: Five years from date of completion of the installation of the fluid-applied weather barrier membrane.

PART 2 — PRODUCTS

2.01 FLUID-APPLIED, VAPOR PERMEABLE MEMBRANE WEATHER BARRIER

A. Fluid-Applied, Fully-Adhered, Vapor-Permeable Membrane Weather Barrier, Basis of Design: Subject to compliance with requirements, provide the following:

1. Single Component Acrylic Membrane: Vycor® enV, as manufactured by GCP Applied Technologies, Inc.,
62 Whittemore Avenue, Cambridge, MA.

B. Physical and Performance Properties: Provide products with the following minimum properties:

1. Membrane Air Permeance: Not to exceed 0.0004 cfm/sq. ft. of surface area (at specified thickness) at 1.57-lbf/sq. ft. pressure difference (0.002 L/s x sq. m of surface area at 75-Pa) when tested per ASTM E283.

1. Membrane Vapor Permeance: Not less than 20 perms, when tested per ASTM E96.
2. Tensile Strength: ASTM D412, Die C Modified: min, 400 psi
3. Elongation: ASTM D412, Die C Modified: min, 200 %
4. UV Exposure Limit: Not more than 120 calendar days; per ASTM D412 and ASTM E96-Method B.
5. Meets the conditions of acceptance when applied to plywood and oriented strand board substrates of ICC AC 212 (Acceptance Criteria for Water Resistive Coatings Used as Water Resistive Barriers Over Exterior Sheathing).

2.02 ACCESSORY MATERIALS

A. General: Accessory materials recommended by air barrier manufacturer for intended use and compatible with air barrier membrane. Liquid-type accessory materials shall comply with VOC limits of authorities having jurisdiction.

B. Wall Primer (for Use with Flashing applied to substrate): Liquid waterborne primer recommended for substrate by manufacturer of air barrier material.

1. Flash Point: No flash to boiling point

2. Solvent Type: Water

3. VOC Content: Not to exceed 10 g/l

4. Application Temperature: -4°C (25°F) and above

5. Freezing point (as packaged): -7°C (21°F)

6. Product: Perm-A-BarrierWB Primer manufactured by GCP Advanced Technologies Construction Products.

C. Joint Reinforcing Tape: Non-Woven 4.5” (114 mm) wide fabric tape for joint reinforcement in exterior sheathing panels.

1. Product: Vycor® enV Joint Tape by GCP Applied Technologies.

1. Transition/Flashing Membrane:
	* + 1. Self-adhesive rubberized asphalt integrally bonded to cross-laminated, high-density polyethylene film to provide a min. 0.64 mm (25 mil) thick membrane. Membrane shall be interleaved with disposable silicone-coated release paper until installed.
				1. Product: Vycor® Plus as manufactured by GCP Applied Technologies.
			2. Flashing Description: 0.3 mm of a cream colored non-asphaltic, butyl-modified, adhesive integrally bonded to 0.1 mm of engineered polypropylene film to provide a min. 0.4 mm (14 mil) thick membrane. Membrane shall be interleaved with silicone-coated release paper until installed.
	1. Product: Vycor® PRO as manufactured by GCP Applied Technologies.

E. Sprayed Polyurethane Foam Sealant: 1- or 2-component, foamed-in-place, polyurethane foam sealant, 1.5 to 2.0 lb/cu. ft (24 to 32 kg/cu. m) density; flame spread index of 25 or less according to ASTM E162; with primer and noncorrosive substrate cleaner recommended by foam sealant manufacturer.

1. Joint Sealant: ASTM C920, single-component, neutral-curing silicone; Class 100/50 (low-modulus), Grade NS, Use NT related to exposure, and, as applicable to joint substrates indicated, Use O.
	1. Product: Perm-A-Barrier S100 Sealant as manufactured by GCP Applied Technologies.

PART 3 — EXECUTION

3.01 EXAMINATION

A. Examine substrates, areas, and conditions, with Installer present, for compliance with requirements and other conditions affecting performance.

1. Verify that substrates are sound and free of oil, grease, dirt, excess mortar, or other contaminants.

2. Verify that concrete has cured and aged for minimum time period recommended by air barrier manufacturer.

3. Verify that concrete is visibly dry and free of moisture. Test for capillary moisture by plastic sheet method according to ASTM D4263.

4. Verify that masonry joints are struck flush and completely filled with mortar.

5. Proceed with installation only after unsatisfactory conditions have been corrected.

3.02 SURFACE PREPARATION

A. Refer to manufacturer’s literature for requirements for preparation of substrates. Surfaces shall be sound and free of voids, spalled areas, loose aggregate and sharp protrusions. Remove contaminants such as grease, oil and wax from exposed surfaces. Remove dust, dirt, loose stone and debris. Use repair materials and methods that are acceptable to manufacturer of the fluid-applied air barrier system.

B. Exterior sheathing panels: Ensure that the boards are sufficiently stabilized with corners and edges fastened with appropriate screws. Gaps greater than 6 mm (1/4 in.) should be filled with mastic or caulk, allowing sufficient time to fully cure before application of the fluid applied weather barrier system.

C. Masonry Substrates: Apply weather barrier over concrete block and brick with smooth trowel-cut mortar joints, struck full and flush. Fill all voids and holes, particularly in the mortar joints, with a lean mortar mix, non-shrinking grout or parge coat.

D. Related Materials: Treat construction joints and install flashing as recommended by manufacturer.

E. Clean, prepare, treat, and seal substrate according to manufacturer's written instructions. Provide clean, dust-free, and dry substrate for weather barrier application.

F. Mask off adjoining surfaces not covered by air barrier to prevent spillage and overspray affecting other construction.

G. Remove grease, oil, bitumen, form-release agents, paints, curing compounds, and other penetrating contaminants or film-forming coatings from concrete.

H. Remove fins, ridges, mortar, and other projections and fill honeycomb, aggregate pockets, holes, and other voids in concrete with substrate patching membrane.

I. Remove excess mortar from masonry ties, shelf angles, and other obstructions.

J. Cover gaps in substrate plane and form a smooth transition from one substrate plane to another with stainless-steel sheet mechanically fastened to structural framing to provide continuous support for weather barrier.

3.03 JOINT TREATMENT

A. Concrete and Masonry: Prepare, treat, rout, and fill joints and cracks in substrate according to ASTM C1193 and weather barrier manufacturer's written instructions. Remove dust and dirt from joints and cracks complying with ASTM D4258 before coating surfaces.

1. Prime substrate if applicable prior to installing transition/flashing membrane.

B. Gypsum Sheathing/Plywood/OSB: Fill joints greater than 1/4 inch (6 mm) with sealant according to ASTM C1193 and with weather barrier manufacturer's written instructions. Apply an 8 mm thickness of weather barrier at the sheathing joints and embed manufacturer’s joint tape joint in accordance with weather barrier manufacturer’s written instructions.

3.04 WEATHER BARRIER MEMBRANE INSTALLATION

A. Apply weather barrier membrane to achieve a continuous monolithic membrane according to weather barrier manufacturer's written instructions.

B. Apply weather barrier membrane within manufacturer's recommended application temperature ranges.

C. Apply a continuous unbroken weather barrier to substrates according to the following minimum thickness. Apply membrane in full contact around protrusions such as masonry ties.

1. Vapor-Permeable Membrane Weather Barrier: 30-mil (0.8-mm) wet film thickness, 15-mil (0.4-mm) dry film thickness.

Note: The applicator goal should be a continuous membrane at a thickness of 30-mil (0.8-mm) wet film thickness, 15-mil (0.4-mm) dry film thickness, adjust thickness on substrates such as concrete or concrete masonry units if required to achieve a continuous membrane.

D. Do not cover weather barrier until it has been tested and inspected by Owner's testing agency.

E. Correct deficiencies in or remove weather barrier that does not comply with requirements; repair substrates and reapply weather barrier components.

3.05 TRANSITION/FLASHING MEMBRANE INSTALLATION

A. Install strips, transition membrane, flashing and accessory materials according to weather barrier manufacturer's written instructions to form a seal with adjacent construction and maintain a continuous weather barrier.

1. Coordinate the installation of weather barrier with installation of roofing membrane and base flashing to ensure continuity of weather barrier with roofing membrane.

2. Install strip on roofing membrane or base flashing so that a minimum of 3 inches (75 mm) of coverage is achieved over both substrates.

3. Install all flashings only after application of weather barrier.

B. Apply primer to substrates when applicable to receive transition membrane/flashing at required rate and allow drying. Limit priming to areas that will be covered by transition/flashing tape in same day. Reprime areas exposed for more
than 24 hours.

1. Prime glass-fiber-surfaced gypsum sheathing not covered with weather membrane material with number of prime coats needed to achieve required bond, with adequate drying time between coats.

C. Connect and seal exterior wall weather barrier membrane continuously to roofing membrane air barrier, concrete below-grade structures, floor-to floor construction, exterior glazing and window systems, glazed curtain-wall systems, storefront systems, exterior louvers, exterior door framing, and other construction used in exterior wall openings, using accessory materials.

D. At end of each working day, seal top edge of transition/flashing strips to substrate acceptable sealant or fluid applied weather barrier.

E. Apply joint sealants forming part of weather barrier assembly within manufacturer's recommended application temperature ranges. Consult manufacturer when sealant cannot be applied within these temperature ranges.

F. Wall Openings: Prime concealed perimeter frame surfaces of windows, curtain walls, storefronts, and doors. Apply transition/flashing strip so that a minimum of 3 inches (75 mm) of coverage is achieved over both substrates. Maintain 3 inches (75 mm) of full contact over firm bearing to perimeter frames with not less than 1 inch (25 mm) of full contact.

1. Transition/Flashing Membrane: Roll firmly to enhance adhesion.

G. Fill gaps in perimeter frame surfaces of windows, curtain walls, storefronts, and doors, and miscellaneous penetrations of weather barrier membrane with foam sealant.

H. Repair punctures, voids, and deficient lapped seams in strips and transition/flashing strips. Slit and flatten fishmouths and blisters. Patch with transition/flashing strips extending 6 inches (150 mm) beyond repaired areas in strip direction.

3.06 FIELD QUALITY CONTROL

A. Testing Agency: Owner may engage a qualified testing agency to perform tests and inspections and prepare test reports.

B. Inspections: Air barrier materials and installation are subject to inspection for compliance with requirements. Inspections may include the following:

1. Continuity of weather barrier system has been achieved throughout the building envelope with no gaps or holes.

2. Continuous structural support of weather barrier system has been provided.

3. Masonry and concrete surfaces are smooth, clean and free of cavities, protrusions, and mortar droppings.

4. Site conditions for application temperature and dryness of substrates have been maintained.

5. Maximum exposure time of materials to UV deterioration has not been exceeded.

6. Surfaces have been primed, if applicable.

7. Laps in transition/flashing strips have complied with minimum requirements and have been shingled in the correct direction (or acceptable sealant has been applied on exposed edges), with no fishmouths.

8. Acceptable termination sealant has been applied on cut edges.

9. Transition/flashing strips have been firmly adhered to substrate.

10. Compatible materials have been used.

11. Transitions at changes in direction and structural support at gaps have been provided.

12. Connections between assemblies (membrane and sealants) have complied with requirements for cleanliness, preparation and priming of surfaces, structural support, integrity, and continuity of seal.

13. All penetrations have been sealed.

C. Remove and replace deficient weather barrier components and retest as specified above.

3.07 CLEANING AND PROTECTION

A. Protect weather barrier system from damage during application and remainder of construction period, according to manufacturer's written instructions.

B. Protect weather barrier from exposure to UV light and harmful weather exposure as required by manufacturer. Remove and replace air barrier exposed for more than 120 days.

C. Clean spills, stains, and soiling from construction that would be exposed in the completed work using cleaning agents and procedures recommended by manufacturer of affected construction.

D. Remove masking materials after installation.