

SECTION 07 27 27

Self-adhered sheet membrane water resistive air barriers, vapor permeable

Vycor® enV-S™ Specification

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 self-adhered vapor permeable weather barrier membrane system located in the non-accessible part of the wall.
2. Materials and installation methods to seal air leakage pathways in roof and foundation junctions, window and door openings, and other penetrations through the wall assembly.

1.03 PERFORMANCE REQUIREMENTS

- A. General: Weather barrier shall be capable of performing as a continuous vapor-permeable air barrier and as a liquid-water drainage plane flashed to discharge to the exterior incidental condensation or water penetration.
- B. The building envelope shall be designed and constructed with a continuous weather barrier to control air leakage into, or out of the conditioned space. A weather barrier shall also be provided for interior partitions between conditioned space and space designed to maintain temperature or humidity levels which differ from those in the conditioned space by more than 50% of the difference between the conditioned space and design ambient conditions. The weather barrier shall have the following characteristics:
 1. It must be continuous, with all joints made airtight.
 2. It shall have an air permeability not to exceed 0.0004 cfm/sq. ft. under a pressure differential of 0.3 in. water. (1.57 psf) (equal to 0.002L/sq. m @ 75 Pa), when tested in accordance with ASTM E2178.
 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.
 - d. 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.

1.05 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. ASTM C920 Specifications for Elastomeric Joint Sealants
 2. ASTM D412 Standard Test Methods for Rubber Properties in Tension
 3. ASTM D570 Test Method for Water Absorption of Plastics
 4. ASTM D903 Standard Test Method for Peel or Stripping Strength of Adhesive Bonds
 5. ASTM D1004 Test Method for Initial Tear Resistance of Plastic Film and Sheeting
 6. ASTM D1876 Test Method for Peel Resistance of Adhesives
 7. ASTM D1938 Test Method for Tear Propagation Resistance of Plastic Film and Sheeting
 8. ASTM D1970 Standard Specification for Self-Adhering Polymer Modified Bituminous Sheet Materials Used as Steep Roofing Underlayment for Ice Dam Protection
 9. ASTM D4263 Test Method for Indicating Moisture in Concrete by the Plastic Sheet Method
 10. ASTM D4541 Test Method for Pull-off Strength of Coatings Using Portable Adhesion Testers
 11. ASTM D5034 Test Method for Breaking Strength and Elongation of Textile Fabrics
 12. ASTM E96 Test Methods for Water Vapor Transmission of Materials
 13. ASTM E154 Test Methods for Water Vapor Retarders Used in Contact with Earth Under Concrete Slabs, on Walls, or as Ground Cover
 14. ASTM E1186 Practice for Air Leakage Site Detection in Building Envelopes and Air Retarder Systems

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| 15. | ASTM E2178 | Standard Test Method for Air Permeance of Building Materials |
| 16. | ASTM E2357 | Standard Test Method for Determining Air Leakage of Weather barrier Assemblies |
| 17. | AATCC-127 | Water Resistance: Hydrostatic Pressure Test (American Association of Textile Chemists and Colorists) |

1.06 SUBMITTALS

- A. Product Data: Include manufacturer's written instructions for evaluating, preparing, and treating substrate; technical data; and tested physical and performance properties of weather barrier.
- B. Warranty: Submit a sample warranty identifying the terms and conditions stated in Article 1.10.

1.07 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, weather 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.
- B. Source Limitations: Obtain primary weather barrier material and self-adhered flashing through one source from a single manufacturer.
- C. 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. Pre-installation conference shall include the parties responsible for ensuring continuity of the weather barrier.

1.08 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 components on the job site. Provide cover on top and all sides, allowing for adequate ventilation.
- C. Protect fluid-applied components from freezing and extreme heat.
- D. Sequence deliveries to avoid delays, but minimize on-site storage.

1.09 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 weather barrier. Do not apply weather barrier to a wet substrate or during snow, rain, fog, or mist.

1.10 WARRANTY

- A. Submit manufacturer's warranty that weather barrier and accessories are free of defects at time of delivery and are manufactured to meet manufacturer's published physical properties and material specifications.
- B. Warranty Period: Five years from date of completion of the weather barrier membrane installation.

PART 2 — PRODUCTS

2.01 MEMBRANE (Basis-of-Design)

- A. SELF-ADHERED WEATHER BARRIER MEMBRANE: Vycor® enV-S™ manufactured by GCP Applied Technologies, Inc., 62 Whittemore Avenue, Cambridge, MA; a self-adhered membrane consisting of a breathable carrier film with a specially designed adhesive, which permits vapor permeability and provides superior protection against the damaging effects of air and water ingress on building structures. Product shall have the following minimum physical properties:
 1. Air Permeance, ASTM E2178: Not to exceed 0.0004 cfm/sq. ft. under a pressure differential of 0.3 in. water. (1.57 psf) (equal to 0.002L/sq. m @ 75 Pa)
 2. Water Vapor Permeance, ASTM E96: Not less than 15 perms
 3. Water Resistance, AATCC-127 Hydrostatic Test Per ICC ES AC-38: Pass
 4. Breaking Force, ASTM D5034: 54 lbf MD, and 46 lbf CD
 5. Peel Adhesion, AAMA 711/ASTM D3330: min. 4 pli to unprimed plywood; min 3 pli to Vycor® enV-S™ membrane
 6. UV Exposure Limit: Not more than 90 calendar days
 7. Water Penetration Resistance Around Nails, ASTM D1970 Modified: Pass
 8. Surface Burning Characteristics, ASTM E-84: Class A. Flame Spread Index of 5, and Smoke Developed Index of 15
 9. Meets the conditions of acceptance when applied to plywood and oriented strand board substrates of ICC AC-38 (Acceptance Criteria for Water-Resistive Barriers, including criteria set forth in section 3.4 for self-adhering weather barriers)

2.02 ACCESSORY MATERIALS

- A. General: Accessory materials recommended by weather barrier manufacturer for intended use and compatible with weather barrier membrane. Liquid type accessory materials shall comply with VOC limits of authorities having jurisdiction
- B. RANSITION FLASHING/MEMBRANE: Self-Adhering flashing materials bonded comprising an adhesive material integrally bonded to a high performance film material as noted below:
 - 1. Product: Vycor® Plus flashing as manufactured by GCP Applied Technologies, Inc.; a rubberized asphalt based adhesive integrally bonded to cross-laminated, high-density polyethylene film to provide a minimum 0.64mm (25 mil) thick membrane.
 - 2. Product: Vycor® Pro flashing as manufactured by GCP Applied Technologies, Inc; a butyl rubber based adhesive integrally bonded to an engineered polypropylene film to provide a minimum 0.36mm (14 mil) thick membrane.
- C. Primer for Primary Self-adhered weather barrier membrane: Perm-A-Barrier Primer Plus manufactured by GCP Applied Technologies, Inc; a water-based primer which imparts an aggressive, high tack finish on the treated substrate. Product shall have the following minimum physical properties:
 - 1. Color: Milky White (wet), Clear (dry)
 - 2. Weight: 8.25 lbs./gal.
 - 3. Solids Content (by wt.): 53-57%
 - 4. Solvent Type: Water
 - 3. VOC Content: Not to excess 1 g/L
 - 4. Application Temperature: 4°C (40°F) and above
- B. Wall Primer for Self-adhered transition membrane and Self-adhered flexible membrane wall flashing: Perm-A- Barrier WB Primer manufactured by GCP Applied Technologies, Inc; a water-based primer which imparts an aggressive, high tack finish on the treated substrate. Product shall have the following minimum physical properties:
 - 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)

2.03 PENETRATIONS & TERMINATION SEALANT

- A. Termination Sealant: Perm-A-Barrier S100 sealant manufactured by GCP Applied Technologies, Inc, or alternative sealant recommended by weather barrier manufacturer.

PART 3 — EXECUTION

3.01 EXAMINATION

- A. Verify that substrates and conditions are ready to accept the Work of this section. Notify [engineer] [architect] [consultant] in writing of any discrepancies. Commencement of the Work or any parts thereof shall mean acceptance of the prepared substrates.
- B. All surfaces must be sound, dry, clean and free of oil, grease, dirt, excess mortar or other contaminants detrimental to the adhesion of the membranes. Fill voids, gaps and spalled areas in substrate to provide an even plane. Strike masonry joints full-flush.
- C. Curing compounds or release agents used in concrete construction must be resin based without oil, wax or pigments.
- D. 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 weather barrier assembly.
- B. Exterior sheathing panels: Ensure that the boards are sufficiently stabilized with corners and edges fastened with appropriate screws in accordance with exterior sheathing manufacturers written instructions. Mechanical fasteners penetrating sheathing panels shall be set flush and fastened to a solid backing material.
- 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. Concrete Substrates: Remove grease, oil, bitumen, form-release agents, paints, curing compounds, and other penetrating contaminants or film-forming coatings from concrete. Concrete shall be cured for a minimum of 14 days prior to application of the self-adhered weather barrier membrane, transition flashing, or primer. Concrete Block and Concrete substrates must be primed prior to application of the self-adhered weather barrier membrane

3.03 WEATHER BARRIER MEMBRANE INSTALLATION

- A. Refer to manufacturer's literature for recommendations on installation
- B. Apply weather barrier membrane to achieve a continuous weather barrier according to weather barrier manufacturer's written instructions.

C. Application of Self-Adhered Weather Barrier Membrane

1. Install weather barrier to dry surfaces at air and surface temperatures of 4°C (40°F) and above in accordance with manufacturer's recommendations, at locations indicated on Construction Documents.
2. Vycor® enV-S™ weather resistive barrier can typically be installed over clean and dry wood substrate (plywood or OSB) without aid of an adhesive primer. In those cases when adhesion appears to be marginal, or when applying the weather barrier over cured concrete or concrete block, apply Perm-A-Barrier Primer Plus primer in accordance with manufacturer's installation requirements. Allow primer to dry to a tack before installing weather barrier membrane.
3. Precut pieces of weather barrier into easily handled lengths.
4. Apply membrane horizontally, or vertically, beginning at the base of the wall and working up.
5. Remove release linear and position membrane carefully before placing against the surface.
6. When properly positioned, place against surface by pressing firmly into place. Roll membrane with extension-handled countertop roller immediately after placement.
7. Overlap adjacent pieces (side and end laps) 50 mm (2 in.) and roll seams.
8. Seal around all penetrations with penetration & termination sealant.
9. Coordinate the installation of weather barrier with roof installer to ensure continuity of membrane with roof weather barrier.
10. At end of each working day seal top edge of weather barrier to substrate with termination sealant.
11. Do not expose weather barrier membrane to sunlight for more than 90 days prior to enclosure.
12. Inspect installation prior to enclosing and repair punctures, damaged areas and inadequately lapped seams with a patch of the membrane sized to extend 150 mm (6 in.) in all directions from the perimeter of the affected area.

3.04 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.
 4. Seal all non-watershedding edges of flashings, transition membrane and auxiliary materials with compatible sealant.
- B. Apply primer to substrates to receive transition membrane at required rate and allow to dry. Limit priming to areas that will be covered by transition tape in same day. Re-prime areas exposed for more than 24 hours.
 1. Prime glass-fiber-surfaced gypsum sheathing not covered with air membrane material with number of prime coats needed to achieve required bond, with adequate drying time between coats.
- C. Connect and seal weather barrier membrane continuously to roofing membrane weather barrier, concrete floor-to floor construction, exterior glazing and window systems, exterior door framing, and other construction used in exterior wall openings, using accessory materials.
- D. At end of each working day, seal top edge transition membrane to substrate with termination sealant.
- E. Repair punctures, voids, and deficient lapped seams in transition membrane. Slit and flatten fish-mouths and blisters. Patch with transition membrane extending 6 inches (150 mm) beyond repaired areas in strip direction.

3.05 FIELD QUALITY CONTROL

- A. Notify responsible parties as weather barrier installation is completed to allow for review and inspection as necessary prior to enclosing weather barrier materials.
- B. Remove and replace deficient weather barrier components and retest as specified above.

3.06 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 weather barrier exposed for more than 90 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.

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GCP0083 xxx-xxx-xx16

