## MANUFACTURER'S GUIDE SPECIFICATIONS

# SECTION 07 27 26
# FLUID-APPLIED MEMBRANE AIR & VAPOR BARRIERS

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# SECTION 07 27 26

# FLUID-APPLIED MEMBRANE AIR & VAPOR BARRIERS

## PART 1 GENERAL

### 1.1 SECTION INCLUDES

A. An asphalt emulsion fluid-applied membrane and accessory products for use as an air barrier, water resistive barrier and vapor barrier in above-grade walls.

B. Materials and installation to bridge and seal the following leak pathways and gaps:
   1. Connections of the walls to the roof air barrier
   2. Connections of the walls to the foundations
   3. Seismic and expansion joints
   4. Openings and penetrations of window frames, door frames, store front, curtain wall
   5. Termination at existing construction and at neighboring wall assemblies
   6. Door frames Piping, conduit, duct and similar penetrations
   7. Masonry ties, screws, bolts and similar penetrations
   8. All other air leakage pathways through the walls

### 1.2 RELATED SECTIONS

A. Section 03 30 00 - Cast-In-Place Concrete [NOTE TO SPECIFIER: Require that backup concrete be free of fins, protrusions and large holes]

B. Section 04 20 00 - Unit Masonry [NOTE TO SPECIFIER: When concrete masonry unit (CMU) block walls are to receive air barrier materials it is critical to address surface preparation issues in this section. Due to the method of installation of the CMU, generally from the inside out, the most critical surfaces to receive the air barrier materials are neglected and not tooled properly. It is strongly suggested to cut and paste text located in PART 3 – EXECUTION, Article 3.02, Paragraph A of Section 07 27 13 into Section 04 20 00. The masonry trade must be made aware that this is a critical element for the self-adhering air barrier material. The performance of the air barrier material is directly related to the substrate OVER WHICH IT WILL be applied.]

C. Section 07 13 00 - Sheet Waterproofing

D. Section 07 14 00 – Fluid-Applied Waterproofing

E. Section 07 11 00 – Damp Proofing.

F. Section 07 21 00 - Thermal Insulation

F. Section 07 53 00 – Elastomeric Membrane Roofing

G. Section 07 62 00 - Sheet Metal Flashing and Trim: Metal through-wall flashings

H. Section 07 65 00 – Flexible Flashings: Self-adhering and EPDM through-wall flashing

I. Section 07 90 00 - Joint Protection: Joint sealant materials and installation.

J. Section 08 12 00 - Metal Door Frames

K. Section 08 43 00 – Storefronts

L. Section 08 44 00 – Curtain Wall and Glazed Assemblies

M. Section 08 51 00 - Metal Windows

N. Section 09 29 00 - Gypsum Sheathing: Gypsum sheathing over metal studs.

O. Section [_____] Other

1.3 REFERENCES

A. American Association of Textile Chemists and Colorists (AATCC) Test Method 127. "Water Resistance – Hydrostatic Pressure Test"

B. American Society of Heating, Refrigerating and Air-Conditioning Engineers (ASHRAE) Standard 90.1-2013 "Energy Standard for Buildings Except Low-Rise Residential Buildings"

C. ASTM C 920 Standard Specification for Elastomeric Joint Sealants

D. ASTM D 1970 Standard Specification for Self-Adhering Polymer Modifed Bituminous Sheet Materials Used as Steep slope roofing Underlayment for Ice Dam Protection.

ASTM D 4541 Standard Test Method for Pull-Off Strength of Coatings Using Portable Adhesion Testers

F. ASTM E 96 Standard Test Methods for Water Vapor Transmission of Materials.

G. ASTM E 783 Standard Test Method for Field Measurement of Air

Leakage Through Installed Exterior Windows and Doors

H. ASTM E 1105 Standard Test Method for Field Determination of Water Penetration of Installed Exterior Windows, Skylights, Doors, and Curtain Walls by Uniform or Cyclic Static Air Pressure Difference

I. ASTM E 2178 Standard Test Method for Air Permeance of Building Materials

J. ASTM E 2357 Standard Test Method for Determining Air Leakage of Air Barrier Assemblies

K. Canadian General Standards Board (CGSB) 71-GP-24M Standard for: Adhesive, Flexible, for Bonding Cellular Polystyrene Insulation

1.4 PERFORMANCE REQUIREMENTS

A. Installed product and accessories constitute a continuous air barrier, as described in ASHRAE Standard 90.1-2010 Section 5.4.3.1

B. Installed product and accessories shall perform as a liquid water drainage plane flashed to discharge to the exterior any incidental condensation or water penetration.

C. Installed product and accessories shall exhibit an air leakage rate, infiltration and exfiltration modes, measured after pressure cycling, not to exceed 0.2 L/s*$m^2$ at 75 Pa (0.040 CFM/$ft^2$ at 1.57 PSF) according to ASTM E 2357.

D. Product shall be minimum 0.040 inch (40 mils) membrane thickness based on % solids calculation. Membrane thickness = wet mil application * volume % solids.

E. Product shall be asphalt emulsion based, maximum 100 g/L volatile organic content (VOC).

F. Product shall be installable as an air-drying 1-part system or as a rapid cure co-spray system as described below
   1. 1-part system: Apply by spray, roller or brush. Shall be approved by air barrier manufacturer for installation at ambient and substrate temperature of 40°F and higher. Using this technique, product shall be rain wash-off resistant within 48 hours of installation.
   2. Co-Spray system: dispense through approved equipment which provides tandem spray of product with chloride-free deliquescent salt solution. Shall be approved by air barrier manufacturer for installation at ambient and substrate temperature of 20°F and

higher. Using this technique, product shall be rain wash-off resistant within 1 hour of installation.

G. Cured product shall meet the following requirements:

| REQUIREMENT | RESULT | TEST METHOD |
|---|---|---|
| Air Permeance – on Porous Substrate | Not more than 0.02 L/s*$m^2$ at 75 Pa (0.004 CFM/$ft^2$ at 1.57 PSF) | ASTM E-2178, mod sprayed on CMU |
| Air Permeance – Free Film | Not more than 0.02 L/s*$m^2$ at 75 Pa (0.004 CFM/$ft^2$ at 1.57 PSF) | ASTM E-2178 |
| Low Temperature Flexibility | No cracking at minus 20 degrees F, 180 degree bend over 1 inch mandrel | ASTM D 1970 |
| Fastener Sealability | No water leaking through nail penetration after 24 h. | ASTM D 1970 |
| Water Resistance | Product spray-applied to CMU and gypsum sheathing with joint shall resist a 55 cm (22 inch) column of water for 5 hours, no leaking or wet through. | AATCC-127 - mod, static head generated with 5"diameter PVC pipe sealed to specimen |
| Pull Adhesion | Not less than 16 $lb_f$ per square inch (or report value at substrate failure) on glass-faced gypsum sheathing and concrete masonry unit (CMU) | ASTM D 4541, modified 4 inch wood puck |

## 1.5 SUBMITTALS

A. Provide submittals in accordance with [Section 01 33 00]

B. At bid submission, provide evidence to the Architect of installer qualification by the air barrier manufacturer.

C. Shop drawings showing locations and extent of air barrier and details of all typical conditions.

D. Manufacturer's technical data sheets and material safety data sheets for product and accessories.

E. Manufacturer's installation instructions.

F. Certification of compatibility by manufacturer, listing all materials on the project with which the product and accessories may come into contact.

G. Free film sample of product at representative cured thickness, minimum 2 inch by 3 inch size.

H. Samples of accessory products used: detail flashing and liquid flashing.

## 1.6 QUALITY ASSURANCE

A. Installer Qualifications: Shall be experienced in applying the same or

similar materials and shall be specifically approved in writing by air barrier manufacturer.

B. Single-Source Responsibility: Obtain product and accessories from single manufacturer.

C. Product and Accessories shall comply with all state and local regulations controlling use of volatile organic compounds (VOCs).

D. Comply with the provisions of the Owner's building envelope commissioning program in accordance with [Section 01 91 15]

E. Pre-Installation Meeting: Convene [one] [_____] week prior to commencing Work of this Section, in accordance with Section 01 31 19 - Project Meetings.

F. Field-Constructed Mock-Ups: Prior to installation on Project, apply product and accessories on mock-up to verify details under shop drawing submittals, to demonstrate tie-ins with adjoining construction and other termination conditions and to become familiar with properties of materials in application:

[NOTE TO SPECIFIER: incorporate sub paragraph 1 or 2 into Paragraph F]

1. Apply in field-constructed mockups of assemblies as specified in [Section 01 43 39 – Mockups]

2. Construct typical exterior wall panel, 8 feet long by 8 feet wide, incorporating back-up wall, cladding, window and doorframe and sill, insulation, flashing, [building corner condition,] [junction with roof system] [foundation wall] [and] [typical penetrations and gaps]; illustrating interface of materials and seals

G. Allow full cure of product and test mock-up in accordance with Section [01 43 00 – Quality Assurance] and test in accordance with ASTM E 783 and ASTM E1105 for air and water infiltration

H. Cooperate and coordinate with the Owner's inspection and testing agency. Do not cover any installed product unless it has been inspected, tested and approved.

1.7 DELIVERY, STORAGE AND HANDLING

A. Deliver materials to Project site in original packages with seals unbroken, labeled with manufacturer's name, product, lot number and directions for storage.

B. Store materials in their original undamaged packages in a clean, dry,

protected location and within temperature range required by manufacturer.

C. Avoid spillage. Immediately notify Owner, [Architect] [Consultant] if spillage occurs and start clean up procedures. Clean spills and leave area as it was prior to spill.

1.8 WASTE MANAGEMENT AND DISPOSAL

A. Separate and recycle waste materials in accordance with [Section 01 74 19 – Construction Waste Management and Disposal], and with the Waste Reduction Work Plan.

B. Place materials defined as hazardous or toxic waste in designated containers.

C. Ensure emptied containers are stored safely for disposal away from children.

1.9 PROJECT CONDITIONS

A. Do not apply product or accessories during rain or accumulating snowfall.

B. Do not apply product or accessories if rain is expected before the manufacturer's required cure time.

C. Apply product and accessories within approved ambient and substrate temperature range stated in manufacturer's literature.

D. Do not apply product or accessories over incompatible materials.

E. Observe safety and environmental measures indicated in manufacturer's MSDS, and mandated by federal, state and local regulations.

1.10 WARRANTIES: Provide the manufacturer's minimum five year material warranty under provisions of [Section 01 78 36 – Warranties].

PART 2 PRODUCTS

2.1 PRODUCTS:

A. Basis of Design: Barriseal by Carlisle Coatings & Waterproofing, Incorporated. 900 Hensley Lane, Wylie, TX 75098. http://www.carlisleccw.com

B. Others as approved by Architect

2.2 ACCESSORIES: Provide from same manufacturer as main air barrier product.

A. Co-Spray Solution: Chloride-free, deliquescent salt solution for accelerating cure of product in co-spray application.
   1. Barricure by Carlisle Coatings & Waterproofing, Inc.
   2. Others as specified by air barrier manufacturer

B. Detail Flashing: 40 mil thickness, self-adhering flashing consisting of 4 mil cross-laminated HDPE facer laminated with 36 mils SBS-modied asphalt adhesive.
   1. CCW-705 by Carlisle Coatings & Waterproofing, Inc.
   2. Others as specified by air barrier manufacturer

C. Liquid Flashing: Minimum 40 mil wet thickness application of minimum 80% solids, silane-terminated polymer (STPE), moisture-curing elastomer.
   1. Barribond by Carlisle Coatings & Waterproofing, Inc.
   2. Others as specified by air barrier manufacturer

D. Contact Adhesive: Solvent-based, water-based or aerosol. As recommended by air barrier manufacturer for preparing surfaces accepting detail flashing.

E. Detail Mastic: 1-part, synthetic polymer, asphalt-free compound.
   1. LM 800 XL or Barribond by Carlisle Coatings & Waterproofing, Inc.
   2. Others as specified by air barrier manufacturer

F. Reinforcing Fabric: Woven synthetic fabric. Fabric saturated in product shall be able to cover un-filled gaps up to ¼ inch width.
   1. DCH Reinforcing Fabric by Carlisle Coatings & Waterproofing, Inc.
   2. Others as specified by air barrier manufacturer

G. Glass Mat: Chopped glass mat with binder that dissolves in liquid air barrier. For reinforcement in multi-plane and inverted details.
   1. LiquiFiber by Carlisle Coatings & Waterproofing, Inc.
   2. Others as specified by air barrier manufacturer

H. Fill Compound: 2-part chemical-cure asphalt-free elastomer, minimum 80% solids.
   1. CCW-703 V or CCW-201 by Carlisle Coatings & Waterproofing, Inc.
   2. Others as specified by air barrier manufacturer

## 2.3 RELATED MATERIALS BY OTHERS

A. Window Transition Sheet: Membrane for sealing window, door, curtain wall or other fenestration frame to air barrier on opaque wall. Use with manufacturer's recommended accessory items.
   1. SURE-SEAL Pressure-Sensitive Elastoform by Carlisle Coatings & Waterproofing, Inc.

2. Silicone sheet by others, as approved by air barrier manufacturer

[Note to Specifier: Silicone is not compatible with rubberized asphalt. Silicone sealants are suitable for installation OVER poly or foil-faced flashing materials]

B. Silicone Sealant, select any:
1. Dow 758, 790, 791, 795
2. Pecora 890, 891, 895
3. GE Silpruf, Silpruf LM
4. SpecTrem 1 by Tremco Sealants
5. Other product approved by air barrier manufacturer

[Note to Specifier: Silicone is not compatible with rubberized asphalt. Silicone sealants are suitable for installation OVER foil or poly-faced detail flashing typically installed about the perimeter of the rough opening]

C. Polyurethane Foam Sealant, select any:
1. Great Stuff by Dow Chemical Company
2. Froth Pack by Dow Chemical Company
3. Other product approved by air barrier manufacturer

D. Insulation Adhesive, select any
1. LM 800 XL
2. Barribond
3. Sonneborn Premium Adhesive
4. QB-300 Multi-Pupose Construction Adhesive by OSI
5. PL-300 VOC Foamboard Adhesive by Loctite
6. Other product approved by air barrier manufacture

## PART 3 EXECUTION

### 3.1 EXAMINATION

A. Examine substrates, areas, and conditions affecting installation of the air & vapor barrier and accessory products for compliance with requirements. Verify that surfaces and conditions are suitable prior to commencing Work of this section. Do not proceed with installation until unsatisfactory conditions have been corrected.

B. Verify that wall assemblies are dried in, such that water intrusion will not occur from above, behind or around the air barrier installation.

C. Concrete shall be cured for a minimum of seven days. It shall be smooth, with sharp protrusions such as form joints ground flush. Honeycomb and holes/cracks shall be filled with grout or mortar.

D. Surfaces shall be sound, dry and free of oil, grease, dirt, excess mortar or other contaminants.

E. Surfaces shall be supported and flush at joints without large voids or sharp protrusions.

F. Mortar joints shall be struck flush and shall be free of voids. Mortar droppings shall be removed from brick ties and all other surfaces accepting air barrier.

G. Sheathing boards shall be flush at joints, with gaps between boards according to building code and sheathing manufacturer's requirements. Sheathing boards shall also be securely fastened to the structure with proper fastener type, technique and spacing according to building code and sheathing manufacturer's requirements. Sheathing boards shall be repaired or replaced if inspection reveals moisture damage, mechanical damage or if sheathing boards have exceeded the exposure duration or exposure conditions as required by the sheathing manufacturer.

H. Plywood, OSB, lumber or pressure-treated wood moisture content, measured with a wood moisture meter in the core of the substrate, shall be below 20%.

I. Inform Architect [Consultant] [Owner] in writing of
1. Cracks in concrete and masonry.
2. Gaps or obstructions such as steel beams, angles, plates and projections which cannot be spanned or covered by product or accessories.
3. Anticipated problems applying product and accessories over substrate.

## 3.2 SURFACE PREPARATION

[NOTE TO SPECIFIER: Incorporate Paragraph A and its sub-paragraphs into Section 04 20 00 - Unit Masonry]

A. [Note to Mason: This project will have fluid-applied Membrane Air Barrier material applied to the cavity side of the CMU. Special attention and care must be taken to provide a smooth, filled surface to receive the membrane. The care is necessary to insure the design performance of the selected materials.] Concrete masonry unit (CMU) wall shall be prepared as follows to accept the air & vapor barrier:
1. Surfaces shall be free of contaminants such as grease, oil and wax on surfaces to receive membrane
2. The CMU surfaces shall be free from projections.
3. Strike all mortar joints flush to the face of the concrete block.
4. Fill all voids and holes with mortar, sealant or other approved fill material.
5. Surface irregularities exceeding ¼ inch in height or sharp to touch shall be ground flush or made smooth.
6. Fill around all penetrations with mortar, sealant or other approved fill

material and strike flush.

7. If the surfaces cannot be made smooth to the satisfaction of the Architect, it will be the responsibility of the trade to alternatively apply a parge coat (typically one part cement to three parts sand) over the entire surface to receive Air & Vapor Barrier Membrane
8. Remove mortar droppings on brick ties, shelf angles, brick shelves or other horizontal obstructions.

B. Fill cracks, gaps and joints with fill compound or detail mastic.

C. Fill rough gaps around pipe, conduit and similar penetrations with mortar, non-shrink grout, fill compound or polyurethane foam sealant shaved flush.

D. Apply a ¾ inch cant of fill compound at the intersection of the base of the wall and the footing.

3.3 DETAILING

A. Additional materials and installation are required at joints, transitions, openings, terminations, penetrations and similar surface irregularities. Perform detailing before or after product installation.

B. Install product and accessories in details as directed in manufacturer's literature.

C. Cover sheathing joints using either of the following materials, centered over the joint:

1. 2 inch width liquid flashing
2. 4 inch reinforcing fabric imbedded in product.

D. Cover sheathing inside and outside corners using any of the materials listed below. Detail materials shall cover the corner and bear 3 inches minimum onto each side.

1. Detail flashing
2. Reinforcing fabric imbedded in product
3. Glass mat imbedded in product, gaps in substrate pre-filled with detail mastic struck flush

E. Wrap window rough openings using any of the materials listed below. Detail materials shall bear onto wall 3 inches minimum and shall return into window opening 3 inches minimum or ½ inch short of exposed finish.

1. Detail flashing
2. Liquid flashing
3. Glass mat imbedded in product, gaps in substrate pre-filled with detail mastic struck flush

F. Wrap pipe or duct penetrations using any of the materials listed below. Detail materials shall bear onto wall 3 inches minimum and shall bear onto pipe or duct 3 inches or ½ inch short of exposed finish .
   1. Detail flashing
   2. Liquid flashing
   3. Glass mat imbedded in product, gaps in substrate pre-filled with detail mastic struck flush

G. Expansion or deflection joints. Detail flashing with 3-inch minimum bearing on either side of joint. Form bellows or bulb to accommodate movement.

H. At the interface of dissimilar substrates, cover the joint and bear 3 inches on either side using any of the materials listed below:
   1. Detail flashing
   2. Reinforcing fabric imbedded in product
   3. Glass mat imbedded in product, substrate gaps filled with detail mastic

## 3.4 INSTALLATION

A. Apply product over opaque wall surfaces as indicated in Project drawings.

B. Apply product using spray, roller or brush technique as directed by manufacturer.

C. Install product at specified thickness and number of coats in accordance with manufacturer's literature.

D. Perform measurements using a comb gauge or other accepted technique, at sufficient frequency, to verify surfaces are being covered within the minimum to maximum range of manufacturer's required mil thickness.

E. Apply additional product as required to provide a continuous membrane, free of holes.

## 3.5 SCHEDULE

A. Wall substrates and roof or temporary roof shall be in place, effectively enclosing interior space, before proceeding with air barrier installation.

B. Seal penetrations made through installed product according to manufacturer's instructions and drawings.

C. Seal fenestration to product with detail flashing, window transition membrane, silicone sealant or polyurethane foam sealant according to Project drawings

D. Through-wall flashing may be installed before or after product. Seal

termination of metal through-wall flashing to product with 6 inch width counter-flashing strip consisting of any of these:

1. Detail flashing
2. Reinforcing fabric imbedded in product
3. Glass mat imbedded in product

E. Cladding and exterior insulation shall be installed after product.

[Specifier note: Minimize penetrations made through the air barrier by specifying an exterior cladding system which uses the same hardware to simultaneously secure the exterior cladding and the exterior insulation. Seal cladding hardware penetrations to air barrier as indicated in Details or Mockup testing]

F. Sequence Work to enable air barrier continuity at wall-to-foundation, shelf angle, wall-to-roof, fenestration, different wall assemblies and other conditions providing challenges to air barrier continuity.

## 3.6 REPAIR AND PROTECTION

A. Protect from damage during application and remainder of construction period.

B. Inspect before covering. Repair or replace damaged material according to manufacturer's literature.

C. Product and accessories are not designed for permanent exposure. Cover with insulation or exterior cladding as soon as schedule allows.

D. Do not exceed manufacturer's maximum allowed outdoor exposure time of installed product and accessories.

END OF SECTION