

SECTION 07 27 26.03 FLUID APPLIED NON PERMEABLE AIR BARRIER MEMBRANE

SPEC NOTE: This specification includes materials and installation procedures for Air-Bloc 21 trowel applied and Air-Bloc 21S spray applied elastomeric insulation adhesive and non permeable air barrier membranes meeting the requirements of the Massachusetts Energy Code for the building envelope. Air-Bloc 21 and Air-Bloc 21S are used in cavity wall construction to provide an air/vapor and rain barrier membrane. This specification should be adapted to suit the requirements of individual projects. It is prepared in CSI three part format and should be included as a separate section under Division 7 - Thermal and Moisture Protection.

PART 1 - GENERAL

1.01 GENERAL REQUIREMENTS

- A. General Conditions, Supplementary Conditions, Instructions to Bidders and Division One General Requirements shall be read in conjunction with and govern this section.
- B. This Specification shall be read as a whole by all parties concerned. Each Section may contain more or less than the complete Work of any trade. The Contractor is solely responsible to make clear to the Subcontractors the extent of their Work.

1.02 DESCRIPTION

- A. Supply labor, materials and equipment to complete the Work as shown on the Drawings and as specified herein to bridge and seal the following air leakage 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 and door frames, store front, curtain wall.
 - 5. Piping, conduit, duct and similar penetrations.
 - 6. Masonry ties, screws, bolts and similar penetrations.
 - 7. All other air leakage pathways in the building envelope.
- B. Materials and installation methods of the primary air/vapor barrier membrane system and accessories.
- C. Materials and installation methods of through-wall flashing membranes.

1.03 RELATED SECTIONS

- A. Concrete Section [03 XX XX]
- B. Masonry: Section [04 XX XX]
- C. Gypsum Sheathing Section [06 XX XX]
- D. Plywood Sheathing Section [06 XX XX]
- E. Insulation: Section [07 XX XX]
- F. Roofing: Section [07 XX XX]
- G. Wall Panels Section [07 XX XX]
- H. Flashing Section [07 XX XX]
- I. Sealants: Section [07 XX XX]
- J. Door Frames: Section [08 XX XX]
- K. Window Frames: Section [08 XX XX]

1.04 REFERENCES

- A. The following standards are applicable to this section:
 - 1. ASTM E 2178: Standard Test Method for Air Permeance of Building Materials.
 - 2. ASTM E 283: Standard Test Method for Determining the Rate of Air Leakage Through Exterior Windows, Curtain Walls, and Doors Under Specified Pressure Differences Across the Specimen.
 - 3. E 1677 Specification for Air Retarder (AR) Material or System for Low-Rise Framed Building Walls
 - 4. ASTM E 330: Standard Test Method for Structural Performance of Exterior Windows, Curtain Walls, and Doors by Uniform Static Air Pressure Difference.
 - 5. ASTM E 331: Standard Test Method for Water Penetration of Exterior Windows, Skylights, Doors, and Curtain Walls by Uniform Static Air Pressure Difference
 - 5. ASTM E 96: Water Vapor Transmission of Materials.
 - 6. CGSB 37-GP-56M: Membrane, Modified, Bituminous, Prefabricated, and Reinforced.
 - 7. AMMA 2400: Standard Practice for Installation of Windows with a Mounting Flange in Stud Frame Construction.

8. ASTM E 2112: Standard Practice for Installation of Exterior Windows, Doors and Skylights.

1.05 SUBMITTALS

- A. Submit documentation from an approved independent testing laboratory certifying the air leakage and vapor permeance rates of the air barrier membranes, including primary membrane and transition sheets, exceed the requirements of the Massachusetts Energy Code and in accordance with ASTM E 2178.
 1. Test report submittals shall include test results on porous substrate and include sustained wind load and gust load air leakage results.
- B. Submit manufacturers' current product data sheets for the air barrier membrane system

1.06 QUALITY ASSURANCE

- A. Submit document stating the applicator of the primary air/vapor barrier membranes specified in this section is qualified by the manufacturer as suitable for the execution of the Work.
- B. Perform Work in accordance with manufacturer's written instructions and this specification.
- C. Maintain one copy of manufacturer's written instructions on site.
- D. Allow access to Work site by the air barrier membrane manufacturer's representative.
- E. Components used shall be sourced from one manufacturer, including sheet membrane, air barrier sealants, primers, mastics, and adhesives.
- F. Single-Source Responsibility:
 1. Obtain air barrier materials from a single manufacturer regularly engaged in manufacturing the product.
 2. Provide products which comply with all federal, state and local regulations controlling use of volatile organic compounds (VOCs).

1.07 MOCK-UP

- A. Construct mock-up in accordance with Section 01 43 39 – Mock-ups.
- B. Provide mock-up of air/vapor barrier materials under provisions of Section 01 33 23 - Shop Drawings, Product Data and Samples.
- C. Where directed by [engineer] [architect] [consultant], construct typical exterior wall panel, 6 foot long by 6 foot wide, incorporating substrate, window frame, attachment of insulation and showing air barrier membrane application details.
- D. Allow 48 hours for inspection of mock-up by [engineer] [architect] [consultant] before proceeding with air barrier work. Mock-up may remain as part of the Work.
- E. Test mock-up for air and water infiltration to conform with Section 01400 - Quality Control, in accordance with ASTM E 783 and ASTM E 1105.

1.08 PRE-INSTALLATION CONFERENCE

- A. Contractor shall convene [one] week prior to commencing Work of this section, under provisions of Section 01 31 19 – Project Meetings.
- B. Ensure all contractors responsible for creating a continuous plane of air tightness are present.

1.09 DELIVERY, STORAGE AND HANDLING

- A. Refer to current Product MSDS for proper storage and handling.
- B. Deliver materials to the job site in undamaged and original packaging indicating the name of the manufacturer and product.
- C. Store materials on end in original packaging. Protect rolls from direct sunlight until ready for use.
- D. Store air barrier membranes, adhesives and primers at temperatures of 40 degrees F and rising.
- E. Keep solvent away from open flame or excessive heat.
- F. Wasted Management and Disposal
 1. Separate and recycle waste materials in accordance with Section [01355 - Waste Management and Disposal], and with the Waste Reduction Work Plan
- G. Contractor to verify compliance for Volatile Organic Compounds (VOC) limitations of products to comply with all federal, state and local regulations controlling use of volatile organic compounds (VOCs).

1.10 CO-ORDINATION

- A. Ensure continuity of the air seal throughout the scope of this section.

1.11 ALTERNATES

- A. Submit request for alternates in accordance with Section 01 25 00 – Substitution Procedures.
- B. Submit requests for alternates a minimum of ten (10) working days prior to bid date.
- C. Alternate submission to include:
 - 1. Evidence that alternate materials meet or exceed performance characteristics of Product requirements as well as documentation from an approved independent testing laboratory certifying the air leakage rates and vapor permeance rates of the air barrier membranes, including primary membrane and transition sheets, exceed the requirements of the Massachusetts Energy Code and in accordance with ASTM E2178.
 - 2. Copies of the manufacturer's current ISO certification
 - 3. Ten (10) references clearly indicating the membrane manufacturer has successfully completed projects of similar scope and nature for a minimum of ten (10) years
 - 4. Manufacturer's complete set of details for air barrier membrane system showing a continuous plane of air tightness throughout the building envelope.
- D. Acceptable alternates will be confirmed by addendum. Substitute materials not approved in writing prior to bid date shall not be permitted for use on this project.

1.12 WARRANTY

- A. Provide manufacturer's standard 10-year material warranty.

PART 2 – PRODUCTS

2.01 MATERIALS

- A. Air/vapor barrier membrane components and accessories must be obtained as a single-source from the membrane manufacturer to ensure total system compatibility and integrity.
 - 1. Acceptable Manufacturer: Henry Company.
909 N Sepulveda Blvd, Suite 650
El Segundo, CA 90245
(800) 598-7663
Web Site: www.Henry.com

2.02 MEMBRANES (Basis-of-Design)

- A. Primary trowel applied liquid air/vapor barrier membrane shall be Air-Bloc 21 manufactured by Henry; a synthetic trowel grade rubber based adhesive, compatibility with substrates, transition membranes and insulation. Membrane shall have the following physical properties:
 - 1. Meets the air leakage requirements of the Massachusetts Commercial Energy Code (780 CMR, Ch. 13) Energy Conservation Requirements for the Building Envelope.
 - 2. Air permeability: 0.0026 CFM/ft² @ 2.1 lbs/ft² to ASTM E 2178 and ASTM E 283 and have no increased air leakage when subjected to a sustained wind load of 10.5 lbs/ft² for 1 hour and gust wind load pressure of 62.8 lbs/ft² for 10 seconds when tested at 1.6 lbs/ft² to ASTM E 331
 - 3. Water vapor permeance: 0.03 perms to ASTM E 96
 - 4. Nominal wet film thickness: 120 mils
 - 5. Meets CAN/CGSB-51-33 Type I Water Vapor Permeance requirements
 - 6. Long Term Flexible: CGSB 71-GP-24M,
 - 7. Chemical resistance: Mild acids, alkalis and salt;
- B. Primary spray applied liquid air/vapor barrier membrane shall be Air-Bloc 21S manufactured by Henry; a synthetic spray grade rubber based adhesive, compatibility with substrates, transition membranes and insulation. Membrane shall have the following physical properties:
 - 1. Meets the air leakage requirements of the Massachusetts Commercial Energy Code (780 CMR, Ch. 13) Energy Conservation Requirements for the Building Envelope.
 - 2. Air permeability: 0.00024 CFM/ft² @ 1.6 lbs/ft² to ASTM E 2178 and ASTM E 283 and have no increased air leakage when subjected to a sustained wind load of 10.5 lbs/ft² for 1 hour and gust wind load pressure of 62.8 lbs/ft² for 10 seconds when tested at 1.6 lbs/ft² to ASTM E 331
 - 3. Water vapor permeance: 0.055 perms to ASTM E 96
 - 4. Nominal wet film thickness: 85 mils to 90 mils
 - 5. Meets CAN/CGSB-51-33 Type I Water Vapor Permeance requirements
 - 6. Long Term Flexible: CGSB 71-GP-24M,

7. Chemical resistance: Mild acids, alkalis and salt;
- C. Self-adhering transition membrane shall be Blueskin® SA manufactured by Henry; an SBS modified bitumen, self-adhering sheet membrane complete with a cross-laminated polyethylene film. For application temperatures down to 10 degrees F use Blueskin® SA LT. Membrane shall have the following physical properties:
1. Air leakage: <0.0001 CFM/ft² @1.6 lbs/ft² to ASTM E 283-91
 2. Vapor permeance: 0.05 perms to ASTM E96
 3. Membrane Thickness: 0.0394" (40 mils)
 4. Low temperature flexibility: -22 degrees F to CGSB 37-GP-56M
 5. Elongation: 200% to ASTM D412-modified
- D. Alternate joint treatment: HE 183 yellow open weave glass fabric or approved equal.

Spec Note: Masonry Flashings are typically specified in Section 04 05 23.16. Co-ordinate material selection and application with air barrier membrane systems. Blueskin TWF is specifically designed for flashing details with a stronger film and resistance to flow.

- E. Through-wall flashing membrane (Self-Adhering) shall be Blueskin® TWF manufactured by Henry; an SBS modified bitumen, self-adhering sheet membrane complete with a cross-laminated polyethylene film. Membrane shall have the following physical properties:
1. Membrane Thickness: 0.0394 inches (40 mils)
 2. Film Thickness: 4.0 mils
 3. Flow (ASTM D5147): Pass @ 212 degrees F
 4. Puncture Resistance: 134 lbf to ASTM E154
 5. Tensile Strength (film): 5723 psi ASTM D882
 6. Tear Resistance: 13lbs. MD to ASTM D1004
 7. Low temperature flexibility: -22 degrees F to CGSB 37-GP-56M

2.03 PRIMERS

- A. Primer for self-adhering membranes at temperatures above 25 degrees F shall be Aquatac™ Primer manufactured by Henry; a polymer emulsion based adhesive, quick setting. Primer shall have the following physical properties:
1. Colour: Aqua
 2. Weight: 8.7 lbs/gal
 3. Solids by weight: 53%
 4. Water based, no solvent odours
 5. Drying time (initial set): 30 minutes at 50% RH and 70 degrees F
- B. Primer for self-adhering membranes at all temperatures shall be Blueskin® Adhesive manufactured by Henry, a synthetic rubber based adhesive, quick setting, having the following physical properties:
- .1 Color: Blue,
 - .2 Weight: 6 lbs/gal,
 - .3 Solids by weight: 35%,
 - .4 Drying time (initial set): 30 minutes.

2.04 PENETRATION & TERMINATION SEALANT

- A. Termination Sealant shall be HE925 BES Sealant manufactured by Henry; a moisture cure, medium modulus polymer modified sealing compound having the following physical properties:
1. Compatible with sheet air barrier, roofing and waterproofing membranes and substrate,
 2. Complies with Fed. Spec. TT-S-00230C, Type II, Class A
 3. Complies with ASTM C 920, Type S, Grade NS, Class 25
 4. Elongation: 450 – 550%
 5. Remains flexible with aging
 6. Seals construction joints up to 1 inch wide

SPEC NOTE: THERMAL SHORT CIRCUITING To reduce heat loss and restrict air convection between the air barrier membrane and insulating materials, secure the insulation in place with an insulation adhesive applied in a serpentine pattern and butter the joints of panels. Co-ordinate with the Cavity Wall Insulation Section.

2.05 INSULATION ADHESIVE

- A. Insulation adhesive shall be Air-Bloc 21 Insulation Adhesive manufactured by Henry; a synthetic, trowel applied, rubber based adhesive, having the following physical properties:
 - 1. Compatibility: With air barrier membrane, substrate and insulation
 - 2. Air leakage: 0.0026 CFM/ft² @ 2.1 lbs/ft² to ASTM E 283
 - 3. Water vapor permeance: 0.03 perms to ASTM E96
 - 4. Long term flexibility: CGSB 71-GP-24M

PART 3 EXECUTION

3.01 EXAMINATION

- A. Verify that surfaces 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. Fill spalled areas in substrate to provide an even plane. Strike masonry joints flush.
- C. Where curing compounds are used they must be clear resin based without oil, wax or pigments.
- D. Do not proceed with application of air barrier membrane when rain is expected within 24 hours.
- E. Condition materials to room temperature prior to application to facilitate handling.

3.02 SURFACE PREPARATION

- A. Synthetic trowel grade rubber based air/vapor barrier membrane: new concrete should be cured for a minimum of 14 days and must be dry before air barrier membranes are applied.
- B. Ensure all preparatory Work is complete prior to applying primary air/vapor barrier membrane.
- C. Mechanical fasteners used to secure sheathing boards or penetrate sheathing boards shall be set flush with sheathing and fastened into solid backing.

3.03 INSTALLTION OF AIR VAPOR BARRIER SYSTEM

A. JOINT TREATMENT

- 1. Seal joints ¼ inch and less between panels of exterior grade gypsum, DensGlass Gold, plywood, OSB or cementitious panels with joint treatment sealant.
 - a. Fill joint between sheathing with approved joint treatment sealant ensuring contact with all edges of sheathing board. Strike flush any excess sealant over joint layer to form a continuous layer over the joint.
- 2. Seal gaps and voids or irregular joints greater than ¼ inch between panels of exterior grade gypsum, DensGlass Gold, plywood, OSB or cementitious panels with a strip of self-adhering air/vapor barrier transition membrane lapped a minimum of 1 1/2 inches on both sides of the joint.
 - a. Prime surfaces as per manufacturers' instructions and allow to dry.
 - b. Align and position self-adhering air/vapor barrier transition membrane, remove protective film and press firmly into place. Ensure minimum 2 inches overlap at all end and side laps of membrane.
 - c. Roll all laps and membrane with a counter top roller to ensure seal.
- 3. Alternately, joints not exceeding 1/8 inch can be sealed with yellow open weave glass fabric.
 - a. Apply yellow open weave glass fabric centered over joint followed by a 1/8 inch (120mils) thick trowel application of air/vapor barrier membrane.
 - b. Allow to dry prior to application of primary air/vapor barrier membrane.

B. INSIDE AND OUTSIDE CORNERS

- 1. Seal inside and outside corners of sheathing boards with a strip of self-adhering air/vapor transition membrane extending a minimum of 3 inches on either side of the corner detail.
 - a. Prime surfaces as per manufacturers' instructions and allow to dry.
 - b. Align and position self-adhering transition membrane, remove protective film and press firmly into place. Ensure minimum 2 inches overlap at all end and side laps of membrane.
 - c. Roll all laps and membrane with a counter top roller to ensure seal.

C. CRACK TREATMENT – MASONRY AND CONCRETE

1. Seal cracks over 1/16 inches in masonry and concrete with a strip of self-adhering transition membrane lapped a minimum of 1 1/2 inches on both sides of the crack.
 - a. Prime surfaces as per manufacturers' instructions and allow to dry.
 - b. Align and position self-adhering transition membrane, remove protective film and press firmly into place. Ensure minimum 2 inches overlap at all end and side laps of membrane.
 - c. Roll all laps and membrane with a counter top roller to ensure seal.
2. Alternately, static cracks 1/16 inch to 1/8 inch can be sealed with primary air/vapor barrier membrane.
 - a. Fill crack with primary air barrier membrane.
 - b. Allow to dry prior to application of primary air/vapor barrier membrane.

D. TRANSITION AREAS

1. Tie-in to structural beams, columns, floor slabs and intermittent floors, parapet curbs, foundation walls, roofing systems and at the interface of dissimilar materials as indicated in drawings with self-adhering air/vapor barrier transition membrane.
 - a. Prime surfaces as per manufacturers' instructions and allow to dry.
 - b. Align and position self-adhering transition membrane, remove protective film and press firmly into place. Provide minimum 3 inch lap to all substrates.
 - c. Ensure minimum 2 inch overlap at all end and side laps of membrane.
 - d. Roll all laps and membrane with a counter top roller to ensure seal.

Spec Note: Best construction practice requires window sill details to be waterproofed and flashed prior to the placement of the window assembly. SBS modified self-adhering membranes provide the flexibility to wrap around the configurations of wall openings and provide the self-sealing properties to guard against leaks by mechanical fastener attachment.

Spec Note: Specific window manufacturer's instructions over-ride Henry specifications for window openings. The installer is responsible to resolve any conflicts in the specifications, sequencing, materials or techniques between window manufacturer's instructions and Henry specifications BEFORE CONSTRUCTION.

E. WINDOWS AND ROUGH OPENINGS

1. Wrap rough openings with self-adhering membrane as detailed.
 - a. Prime surfaces as per manufacturers' instructions and allow to dry.
 - b. Align and position self-adhering transition membrane, remove protective film and press firmly into place. Ensure minimum 2 inch overlap at all end and side laps of membrane.
 - c. Roll all laps and membrane with a counter top roller to ensure seal.

F. THROUGH-WALL FLASHING MEMBRANE

1. Apply through-wall flashing membrane along the base of masonry veneer walls and over shelf angles as detailed.
 - a. Prime surfaces and allow to dry, press membrane firmly into place, over lap minimum 2 inches at all end and side laps. Promptly roll all laps and membrane to ensure the seal.
 - b. Applications shall form a continuous flashing membrane and shall extend up a minimum of 8 inches up the back-up wall.
 - c. Seal the top edge of the membrane where it meets the substrate using termination sealant. Trowel-apply a feathered edge to seal termination to shed water.
 - d. Install through-wall flashing membrane and extend 1/2 inch from outside edge of veneer. Provide "end dam" flashing as detailed.

G. PRIMARY AIR/VAPOR BARRIER

1. Apply by flat trowel or spray a complete and continuous unbroken film of liquid air/vapor and rain barrier membrane.

- a. For trowel applied membranes apply one component elastomeric air/vapor barrier membrane at a rate of 13.5 sq.ft/gallon to a uniform wet film thickness of 120 mils.
 - b. For spray applied membranes apply one component elastomeric air/vapor barrier membrane at a rate of 18.6 sq.ft/gallon to 19 sq.ft/gallon to a uniform wet thickness of 85 mils to 90 mils.
2. Spray apply or trowel around all projections and penetrations ensuring a complete and continuous air barrier membrane. Lap liquid applied membrane 1 inch over self-adhering membranes to seal leading edge.

3.04 INSTALLATION OF INSULATION

- A. Co-ordinate with Cavity Wall Insulation Section [XXXXX] for insulating materials.
 1. Immediately embed insulation into liquid air vapor barrier membrane and press firmly into place to ensure full contact. Apply additional liquid air vapour barrier membrane if allowed to skin over.
 2. Fully butter all joints of insulation panels with liquid air vapour barrier membrane during installation, except at expansion joints.

3.05 FIELD QUALITY CONTROL

- A. Make notification when sections of Work are complete to allow review of air/vapor barrier system and insulation layer.

3.06 PROTECTION

- A. Damp substrates must not be inhibited from drying out. Do not expose the backside of the substrate to moisture or rain.
- B. Cap and protect exposed back-up walls against wet weather conditions during and after application of membrane. Drying time varies depending on temperature and relative humidity. Protect air barrier Work against wet weather conditions for a minimum of 24 hours.
- C. Air barrier membranes are not designed for permanent exposure. Good practice calls for covering as soon as possible.

END OF SECTION