

# LIQUID-APPLIED AIR BARRIER SYSTEM

## PART 1- GENERAL

### 1.1 SECTION INCLUDES

This section includes the following:

- A. Materials and installation methods for a liquid-applied air barrier system located in the accessible part of the wall.
- B. SRAB (sheet rubberized-asphalt barrier) self-adhered air barrier membrane in roof assemblies.
- C. Materials and installation 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 frames, store front, curtain wall.
  - 5. Barrier pre-cast concrete and other envelope systems.
  - 6. Door frames.
  - 7. Piping, conduit, duct and similar penetrations.
  - 8. Masonry ties, screws, bolts and similar penetrations.
  - 9. All other air leakage pathways in the building envelope.

### 1.2 PRODUCTS INSTALLED BUT NOT SUPPLIED UNDER THIS SECTION

Sheet metal flashings to be built into masonry are furnished under Section 07620.

### 1.3 RELATED SECTIONS

Section 03300 - Cast-In-Place Concrete:

- A. Concrete back-up walls.
- B. Underslab vapor retarder. Section 04200 - Unit Masonry.
- C. Masonry walls.
- D. Masonry veneer cavity walls.

Section 07131 - Self-Adhering Sheet Waterproofing: Below grade waterproofing.

Section 07160 - Bituminous Damp proofing: Below grade damp-proofing.

Section 07210 - Building Insulation: Insulation with integral vapor retarder facing.

Section 07530 - Single-Ply Membrane Roofing.

Section 07620 - Sheet Metal Flashing and Trim: Sheet metal flashings.

Section 07900 - Joint Sealers: Joint sealant materials and installation.

Section [\_\_\_\_\_]: Door frames.

Section 08520 - Aluminum Windows.

Section [\_\_\_\_\_]: Aluminum storefronts and entrances.

Section 08920 - Glazed Aluminum Curtain Walls.

Section 09253 - Gypsum Sheathing: Gypsum sheathing over metal studs.

Section [\_\_\_\_\_]: Other.

## 1.4 PERFORMANCE REQUIREMENTS

Provide air barrier constructed to perform as a continuous air barrier, and as a liquid water drainage plane flashed to discharge to the exterior any incidental condensation or water penetration. Membrane shall accommodate movements of building materials by providing expansion and control joints as required, with accessory air seal materials at such locations, changes in substrate and perimeter conditions.

Commonwealth of Massachusetts Building Code Requirements: The intent of this specification is to require compliance with 780 CMR 13, including Section 1304.1.2 Moisture Control and 1304.3 Air Leakage Exception #3 applies as it relates to Single Wythe Walls.

- A. Code 780 CMR 1304.1.2 Air Barrier Test ASTM-E-2178.01 Exception #3
- B. Code 780 CMR 1304.3.1 Air Barriers: “The building envelope shall be . . . constructed with a continuous air barrier to control air leakage into, or out of the conditioned space.” “The air barrier shall have the following characteristics:
  - 1. It must be continuous, with all joints made air-tight.
  - 2. It (the material used) shall have an air permeability not to exceed 0.001 cubic feet per minute per square foot under a pressure differential of 0.3 in. water (1.57 psi) (0.02L/s.m<sup>2</sup> @ 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. The air barrier shall be joined in an airtight and flexible manner to the air 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.
  - 4. Code 780 CMR 1304.3.2, Air Barrier Penetrations: All penetrations of the air barrier and paths of air infiltration / exfiltration shall be made air-tight.

## 1.5 SUBMITTALS

Provide submittals in accordance with Section 01300.

- A. At bid submission, provide evidence to the Architect of licensing and certification under the Air Barrier Association of America’s (ABAA’s) Quality Assurance Program.
- B. Submit shop drawings showing locations and extent of air barrier and details of all typical conditions, intersections with other envelope systems and materials, membrane counter-flashings, and details showing how gaps in the construction will be bridged, how inside and outside corners are negotiated and how miscellaneous penetrations such as conduits, pipes electric boxes and the like are sealed.

- C. Submit manufacturer's product data sheets for each type of membrane, including manufacturer's printed instructions for evaluating, preparing, and treating substrate, temperature and other limitations of installation conditions, technical data, and tested physical and performance properties.
- D. Submit manufacturer's installation instructions.
- E. Certifications by air/vapor barrier manufacturer that products supplied comply with local regulations controlling use of volatile organic compounds (VOC's).
- F. Certification of compatibility by air barrier manufacturer, listing all materials on the project that it connects to or that come in contact with it.
- G. Submit samples, 3 by 4 inch (75 by 100 mm) minimum size, of each air barrier material required for Project.

## 1.6 QUALITY ASSURANCE

### Installer Qualifications:

- A. The air barrier contractor shall be, during the bidding period as well as for the duration of the installation, officially recognized as a Licensed Contractor by the Air Barrier Association of America (ABAA). The contractor shall carry liability insurance and bonding.
- B. Each worker who is installing air barriers must be either a Certified Applicator or an installer who is registered with ABAA
- C. Each Lead Certified Applicator can supervise a maximum of five registered installers. The Certified Applicator shall be thoroughly trained and experienced in the installation of air barriers of the types being applied. Lead Certified Applicators shall perform or directly supervise all air work on the project.
  - 1. Air barrier installers must be trained and certified by NECA (National Energy Conservation Association) and PSDI (Professional Skills Development Institute for energy conservation)
  - 2. Single-Source Responsibility: Obtain air/vapor barrier materials from a single manufacturer regularly engaged in manufacturing the product.
  - 3. Provide products which comply with all state and local regulations controlling use of volatile organic compounds (VOC's).
  - 4. Preconstruction Meeting: Convene [one] [\_\_\_\_\_] week prior to commencing Work of this section, in accordance with Section 01200 - Project Meetings.
  - 5. Field-Constructed Mock-Ups: Prior to installation of air/vapor barrier, apply air/vapor barrier as follows to verify details under shop drawing submittals and to demonstrate tie-ins with adjoining construction, and other termination conditions, as well as qualities of materials and execution.
- D. Apply air barrier in field-constructed mock-ups of assemblies specified in Section 04200 and Section 09253.
- E. Apply air barrier in field-constructed mock-ups of assemblies specified in Section 01452, "Mock-Ups".
- F. 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 materials interface and seals.

- G. Test mock-up for air and water infiltration to conform with Section 01400 - Quality Control, in accordance with ASTM E 783 and ASTM E1 105.
- H. Cooperate and coordinate with the Owner's inspection and testing agency. Do not cover any installed air and vapor barrier membrane 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, date of manufacture, and directions for storage.
- B. Store materials in their original undamaged packages in a clean, dry, protected location and within temperature range required by air/vapor barrier manufacturer. Protect stored materials from direct sunlight.
- C. Avoid spillage. Immediately notify Owner, [Architect] [Consultant] if spillage occurs and start clean up procedures.
- D. 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 [01355 - Waste Management and Disposal], and with the Waste Reduction Workplan.
- B. Place materials defined as hazardous or toxic waste in designated containers.

#### 1.9 PROJECT CONDITIONS

##### Environmental Conditions:

- A. Apply air barrier within range of ambient and substrate temperatures recommended by air barrier manufacturer.
- B. Do not apply air barrier to a damp or wet substrate, unless the manufacturer specifically permits that for the product.
- C. Do not apply air barrier in snow, rain, fog, or mist.
- D. Do not apply air barrier when the temperature of substrate surfaces and surrounding air temperatures are below those recommended by the manufacturer.

### PART 2- PRODUCTS

#### 2.1 MATERIALS & MANUFACTURER.

- A. Acceptable materials:  
**TNEMEC 156 AB** with leakage rate of 0.0001 – 0.0002 L/S·M<sup>2</sup> at a differential pressure of 75PA. when tested to ASTM E-2178-01, nominal total thickness 14-17 total system mils manufactured by TNEMEC COMPANY in accordance with physical properties as stated in manufacturer's literature.

## 2.2 AUXILIARY MATERIALS

- A. Furnish auxiliary materials recommended by air barrier manufacturer for intended use and compatible with the air/vapor barrier membrane.
- B. Stainless-Steel Sheet Flashing: ASTM A167, Type 304, soft annealed, with No. 2D finish; minimum, 0.0156 inch (0.4 mm) thick.
- C. Transition Strip: If required TNEMEC 152 TNEME-TAPE manufactured by TNEMEC CO self-adhering, smooth surfaced membrane, nominal 20 mil thickness, width as required.
- D. Transition Strip Primer and membrane: If required Primer manufactured by Rubber Polymer Corporation, Henery-Bakor or QWR Grace with transition membrane may be used to bridge opening where substrate gaps occur .
- E. Substrate Filler for TNEMEC 130 PC FILLER manufactured by TNEMEC CO.

## 2.3 PHYSICAL PROPERTIES:

PROPERTY	TEST METHOD	TEST RESULTS
Air Permance Rate	ASTM E2178-01	0.0001- 0.0002 @ 17-26 mils DFT
Elongation (%)	ASTM D 2370	200%
Freeze Thaw	ASTM D 2246	No Blistering, cracking or loss of adhesion after 20 cycles
Humidity	ASTM D 4585	No failure after 2000 hrs
Vapor Permeance	ASTM D 1653 wet method	3.9 perms @ 16 mils DFT
Crack Bridging	ASTM 836	Exceeds ten cycles to 1/8 inch at -15°F
QUV	ASTM G 53	No Blistering, cracking after 4000 hours exposure
Resistance to Bacteria	ASTM D 3273	No more than .5% after 5 weeks
Resistance to Wind Driven Rain	TT-C-555B	No damage, no visual moisture on light weight block after 48 hours
Salt spray	ASTM B117 Two coats applied to concrete block	No Blistering, cracking or delamination failure after 5000 hours

## PART 3- EXECUTION

### 3.1 EXAMINATION

- A. Examine substrates, areas, and conditions under which air barrier systems will be applied, with Installer present, for compliance with requirements. Verify that surfaces and conditions are suitable prior to commencing work of this section.
- B. Do not proceed with installation until unsatisfactory conditions have been corrected.
- C. Ensure that:
  1. Surfaces are sound, dry, even, and free of oil, grease, dirt, excess mortar or other contaminants
  2. Concrete surfaces are cured and dry, smooth without large voids, spalled areas or sharp protrusions.
  3. Masonry joints are flush and completely filled with mortar, and all excess mortar sitting on masonry ties has been removed.

- D. Verify substrate is visibly dry and free of moisture. Test for capillary moisture by plastic sheet method according to ASTM D4263.
- E. Notify Architect in writing of anticipated problems using air barrier over substrate.

### 3.2 SURFACE PREPARATION

- A. Clean, prepare, and treat CMU or concrete substrate according to manufacturer's written instructions.
- B. Provide clean, dust-free, and dry substrate for air barrier application.
- C. Prime wood, metal, and painted substrates with primer recommended by membrane manufacturer.
- D. Prepare, treat, and seal vertical and horizontal surfaces at terminations and penetrations through air barrier and at protrusions according to air barrier manufacturer's written instructions [and approved tested system in accordance with ABAA air barrier testing procedures].

### 3.3 INSTALLATION

#### TNEMEC 156 AIR BARRIER

- A. Install materials in accordance with manufacturer's instructions.
- B. Apply Tnemec 156 AB Air Barrier Coating to all surfaces to be treated with air barrier coating. Single Wythe walls should be treated from the inside in lieu of the exterior wherever possible. Tnemec 156 AB may also be applied to exterior surfaces with specific attention to mortar and joint details. The Air Barrier must be continuous and pinhole free and may require additional inspection to conform to these standards. Applying the TNEMEC 156 over a smooth substrate will improve ease of installation and provide a tighter air barrier. The TNEMEC 156 can be applied as a finish architectural coating as it can be furnished in a finish color. This option will be at the discretion of the architect. In difficult transition location seal with transition strip at beams, columns, changes in substrate material, over the Tnemec 156 membrane as required; and similar joints or connections to provide continuity of air barrier assembly. Generally, when or if required for Single Wythe walls, apply transition strips so that a minimum of 3" (75 mm) coverage is achieved over both substrates. Apply Air Barrier Coating into all transition points using transition membrane only in locations where a gap between substrates exists.
- C. Apply air barrier membrane within recommended application temperature ranges. Consult manufacturer when membrane cannot be applied within these temperature ranges.
- D. Using airless spray equipment having a minimum pressure of 3000 psi, apply first coat of air barrier membrane over inner surface of single Wythe masonry.
- E. Use alternating horizontal and vertical passes to ensure complete coverage of substrate. Seal masonry anchors or other penetrations air tight.
- F. Check surfaces again and if necessary, fill any remaining gaps with mastic substrate filler prior to covering with membrane.
- G. Complete application of membrane at a coverage rate of 70 to 90 sq.ft/gal to provide a seamless, monolithic surface to a thickness of 14-17 mils. Coverage may vary depending on density of substrate.
- H. Use TNEME-TAPE 3" tape in lieu of fully adhered membrane when topcoating of transition area is possible.
- I. The Air Barrier coating may be used as an architectural finish, the A/E maintains rights to TNEMEC standard color charts.
- J. Apply TNEMEC 156 AIR BARRIER within recommended application temperature ranges. Consult manufacturer when sealant cannot be applied within these temperature ranges.

### 3.4 PROTECTING AND CLEANING

- A. Protect air barrier system from damage during application and remainder of construction period, according to manufacturer's written instructions.
- B. Clean spillage and soiling from adjacent construction using cleaning agents and procedures recommended by manufacturer of affected construction.
- C. Protect air/vapor barrier from exposure to the elements as required by the manufacturer.

Specifier Note: This product guide specification is written according to the Construction Specifications Institute (CSI) Format, including *Master Format*, *Section Format*, and *Page Format*, contained in the *CSI Manual of Practice*.

The section must be carefully reviewed and edited by the Architect to meet the requirements of the project and local building code. Coordinate this section with other specification sections and the drawings.

Delete all "Specifier Notes" when editing this section.

Specifier Notes: This section covers Tnemec high-performance coating systems for commercial facilities.

This specification is only a guide listing various coating system options for various environments and should not be used as a final specification. Additional coating systems not listed in this specification are available, and may be more appropriate for your coating application. To finalize this specification, please contact [www.rightergroup.com](http://www.rightergroup.com)

Most coatings specified contain organic solvents. Consult Righter Group for compliance to local VOC regulations.

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