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## MANUFACTURER'S GUIDE SPECIFICATIONS

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# **SECTION 072713**

## **FIRE RESISTANT, SELF-ADHERING MEMBRANE AIR & VAPOR BARRIERS**



**SECTION 07 27 13****FIRE RESISTANT, SELF-ADHERING MEMBRANE AIR & VAPOR BARRIERS****PART 1 GENERAL****1.01 SECTION INCLUDES**

- A. A self-adhered membrane and accessory products of fire-resistant composition for use as an air and vapor barrier in exterior walls.
- B. 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, door frames, store front, curtain wall
  - 5. Barrier pre-cast concrete and other envelope systems
  - 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

**1.02 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 & Vapor 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 & Vapor 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 & Vapor Barrier material. The performance of the Air & Vapor 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.

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- F. Section 07 21 00 - Thermal Insulation
- G. Section 07 53 00 – Elastomeric Membrane Roofing
- H. Section 07 62 00 - Sheet Metal Flashing and Trim: Metal through-wall flashings
- I. Section 07 65 00 – Flexible Flashings: Self-adhering and EPDM through-wall flashing
- J. Section 07 90 00 - Joint Protection: Joint sealant materials and installation.
- K. Section 08 12 00 - Metal Door Frames
- L. Section 08 43 00 – Storefronts
- M. Section 08 44 00 – Curtain Wall and Glazed Assemblies
- N. Section 08 51 00 - Metal Windows
- O. Section 09 29 00 - Gypsum Sheathing: Gypsum sheathing over metal studs.
- P. [Section \[ \]](#) Other

### 1.03 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 90.1-2010 “Energy Standard for Buildings Except Low-Rise Residential Buildings”
- C. ASTM C 920 Standard Specification for Elastomeric Joint Sealants
- D. ASTM C 1305 Standard Test Method for Crack Bridging Ability of Liquid-Applied Waterproofing Membrane
- E. ASTM D 882 Standard Test Methods for Vulcanized Rubber and Thermoplastic Elastomers – Tension
- F. ASTM D 1876 Standard Test Method for Peel Resistance of Adhesive

- G. ASTM D 1970 Standard Specification for Self-Adhering Polymer Modified Bituminous Sheet Materials Used as Steep slope roofing Underlayment for Ice Dam Protection
- H. ASTM D 4073 Standard Test Method for Tensile-Tear Strength of Bituminuous Roofing Membranes
- I. ASTM D 4541 Standard Test Method for Pull-Off Strength of Coatings Using Portable Adhesion Testers
- J. ASTM E 84 Standard Test Method for Surface Burning Characteristics of Building Materials
- K. ASTM E 96 Standard Test Methods for Water Vapor Transmission of Materials.
- L. ASTM E 154 Standard Test Methods for Water Vapor Retarders used in Contact with Earth under Concrete Slabs, on Walls or as Ground Cover
- M. ASTM E 783 Standard Test Method for Field Measurement of Air Leakage Through Installed Exterior Windows and Doors
- N. 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.
- O. ASTM E 1354 Standard Test Method for Heat and Visible Smoke Release Rates for Materials and Products Using an Oxygen Consumption Calorimeter
- P. ASTM E 2178 Standard Test Method for Air Permeance of Building Materials
- Q. ASTM E 2357 Standard Test Method for Determining Air Leakage of Air Barrier Assemblies
- R. National Fire Protection Association (NFPA) 285 Standard Fire Test Method for Evaluation of Fire Propagation Characteristics of Exterior Non-Load-Bearing Wall Assemblies Containing Combustible Components

#### 1.04 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  $0.2 \text{ L/s}\cdot\text{m}^2$  at 75 Pa ( $0.040 \text{ CFM/ft}^2$  at 1.57 PSF) according to ASTM E 2357.
- D. Installed product and accessories shall perform as a vapor barrier, installed on the predominantly warm side of the insulation.
- E. For Type I, II, III and IV construction: Installed product and accessories shall be evaluated to NFPA 285 in wall assemblies of Project.
- F. Product shall consist of nominal 0.040 inch (40 mils) thickness composite membrane consisting of an aluminum-faced cross-laminated high density polyethylene sheet laminated with a styrene-butadiene-styrene modified asphalt adhesive.

## G. Product shall meet the following requirements:

| REQUIREMENT  | RESULT  | TEST METHOD   |
|--|---|---|
| Air Permeance  | Not more than 0.02 L/s*m <sup>2</sup> at 75 Pa (0.004 CFM/ft <sup>2</sup> at 1.57 PSF)  | ASTM E-2178   |
| Tensile Strength                                     | Not less than 40 lb <sub>f</sub> per inch   | ASTM D-882  |
| Puncture Resistance                                  | Not less than 50 lb <sub>f</sub>  | ASTM E 154  |
| Tear Initiation and Propagation                      | Not less than 30 lb <sub>f</sub> , machine direction and cross direction  | ASTM D 4073   |
| Low Temperature Flexibility                          | No cracking at minus 20 degrees F, 1 inch mandrel   | ASTM D 1970   |
| Fastener Sealability                                 | No water leaking through fastener penetration after 24 h.   | ASTM D 1970   |
| Water Resistance                                     | Membrane specimen including a lap shall resist a 55 cm (22 inch) column of water for 5 hours, no leaking or wet through.  | AATCC-127, modified static head generated with 5" diameter PVC pipe sealed to specimen  |
| Pull Adhesion  | Not less than 16 lb <sub>f</sub> per square inch (or report value at substrate failure) on glass-faced gypsum sheathing and concrete masonry unit, substrate prepared with contact adhesive | ASTM D 4541, modified 4 inch puck   |
| Lap Adhesion   | Not less than 5 lb <sub>f</sub> per inch of width   | ASTM D 1876   |
| Water Vapor Permeance                                | Not more than 0.1 Perm  | ASTM E-96, Method B   |
| Surface Burning Characteristics.                     | Flame Spread Index:<br>Not more than 25<br>Smoke Generation Index:<br>Not more than 450   | ASTM E 84, sample tested at full coverage, cement board substrate, including surface preparation                              |
| Measurement of Heat Release Rate by Cone Calorimeter | Effective Heat of Combustion of 0 MJ/kg or less<br>Peak heat release rate of 6.67 kW/m <sup>2</sup> or less<br>Total heat release rate of 1.1 MJ/m <sup>2</sup> or less                     | ASTM E 1354, membrane applied to glass-faced gypsum sheathing, including surface preparation. 50 kW/m <sup>2</sup> heat flux. |

### 1.05 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 & vapor barrier manufacturer.
- C. Shop drawings showing locations and extent of air & vapor barrier and details of all typical conditions.
- D. Manufacturer's list and description of wall assemblies, incorporating product, tested per NFPA 285
- E. Manufacturer's technical data sheets and material safety data sheets for product and accessories.
- F. Manufacturer's installation instructions.
- G. Certification of compatibility by manufacturer, listing all materials on the project with which the product and accessories may come into contact.
- H. Sample of product and transition membrane, minimum 2 inch by 3 inch size.

### 1.06 QUALITY ASSURANCE

- A. Installer Qualifications: Shall be experienced in applying the same or similar materials and shall be specifically approved in writing by 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. 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.

#### 1.07 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.

#### 1.08 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.

#### 1.09 PROJECT CONDITIONS

- A. Do not apply product or accessories during rain or accumulating snowfall.
- B. Apply product and accessories within approved ambient and substrate temperature range stated in manufacturer's literature.
- C. Do not apply product or accessories over incompatible materials.
- D. 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

#### 2.01 PRODUCTS AND MANUFACTURERS:

- A. Basis of Design: Fire Resist™ 705 FR-A by Carlisle Coatings & Waterproofing, Incorporated (CCW). 900 Hensley Lane, Wylie, TX 75098. Phone 1-800-527-7092. Website <http://www.carlisleccw.com>
- B. Other equivalent products and manufacturers as approved by Design Professional

#### 2.02 ACCESSORIES: Provide from same manufacturer as air barrier membrane.

- A. Detail Flashing: Similar composition to air barrier membrane. Factory slit to convenient sizes.
  - 1. CCW: Fire Resist 705 FR-A
  - 2. Others: As specified by air barrier membrane manufacturer
- B. Contact Adhesive: Liquid or spray-applied for preparing surfaces accepting air barrier membrane
  - 1. CCW: CCW-702 Solvent-Based , CCW-702 LV VOC Compliant, Solvent-Based, CCW-702 WB Water-Based or CAV-GRIP™ Aerosol Spray
  - 2. Others: As specified by air barrier membrane manufacturer
- C. Detail Mastic: 1-part material for sealing details. Installation over air barrier membrane.

1. CCW: Universal Single Ply Sealant
  2. Others: As specified by air barrier membrane manufacturer
- D. Transition Membrane: Tough, elastomeric sheet capable of bridging a 1” gap. Minimum 60 mils thickness
1. CCW: SURE-SEAL Pressure-Sensitive Elastoform.
  2. Others: As specified by air barrier membrane manufacturer
- E. Fill Compound: 2-part chemical cure sealant, compatible with adhesive side of air barrier membrane.
1. CCW: CCW-703 V Modified polyurethane, 2-part or CCW-201 Polyurethane, 2-part
  2. Others: As specified by air barrier membrane manufacturer

## 2.03 RELATED MATERIALS BY OTHERS

- A. Polyurethane Sealant: used for sealing membrane surface defects, penetrations and terminations :
1. Approved by CCW: Sonneborn NP-1, Dymonic FC, S-M 7100 Permthane Pro-Installer by Schnee-Morehead Div, ITW or Xtra-Bond 7500 TX by Premiere Industrial Supply
  2. Others: As specified by air barrier membrane manufacturer
- B. Silicone Sealant: used for sealing fenestration to air barrier membrane, surface defects and penetrations
1. Approved by CCW: Dow-Corning 758, 790, 791 or 795 or Pecora AVB Silicone, 890, 891 or 895 or GE Silpruf or Silpruf LM
  2. Others: As specified by air barrier membrane manufacturer
- C. Polyurethane Foam Sealant: used for sealing gaps around fenestration and other penetrations
1. Approved by CCW: Great Stuff by Dow Chemical Company, FireBlock Gun Foam by TVM Building Products or Fireblock Foam Sealant by FOMO
  2. Others: As specified by air barrier membrane manufacturer
- D. Insulation Adhesive: used for bonding foam board insulation to air barrier membrane
1. Approved by CCW for polyisocyanurate insulation: LM 800 XL or CAV-GRIP Spray Contact Adhesive by Carlisle Coatings & Waterproofing Incorporated
  2. Approved by CCW for extruded polystyrene insulation: CAV-GRIP Spray Contact Adhesive by CCW, QB-300 Multi-Purpose Construction Adhesive by OSI or PL-300 VOC Foamboard Adhesive by Loctite
  3. Others: As specified by air barrier membrane manufacturer

## PART 3 EXECUTION

### 3.01 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 exceeding ¼ inch across 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 exceeding ¼ inch across. 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.

### 3.02 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 self-adhering Air and Vapor 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 greater than ¼ inch across at any point 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 exceeding ¼ inch width with fill compound or polyurethane sealant.
- 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.

### 3.03 INSTALLATION

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

- B. Allow sealants used during surface preparation to cure fully before applying product.
- C. Apply contact adhesive to all surfaces accepting product, according to manufacturer's instructions.
- D. Apply product to prepared surfaces according to manufacturer's instructions and drawings.
- E. Sequence installation to provide shingled laps. Lap neighboring sheets 2 inches minimum.
- F. Install detail flashing or transition membrane according to manufacturer's drawings and instructions at expansion joints, seismic joints, mechanical/electrical penetrations and similar conditions.
- G. Install detail mastic, polyurethane sealant or silicone sealant covering non-water shedding laps, penetrations and similar surface defects.

#### 3.04 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 membrane, transition membrane, polyurethane sealant, 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 detail flashing.
- E. Cladding shall be installed after product.
- F. Rigid or semi-rigid insulation installed over product shall be attached with insulation adhesive and mechanical fastening according to insulation manufacturer and air barrier manufacturer's instructions.
- G. 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.

#### 3.05 REPAIR AND PROTECTION

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- A. Protect from damage during application and remainder of construction period.
- B. Inspect before covering. Repair or replace damaged material according to Manufacturer's instructions and drawings.
- C. Product and accessories are not designed for permanent exposure. Cover with insulation or exterior cladding as soon as schedule allows.
- D. Outdoor exposure of installed product and accessories shall not exceed 180 days.

END OF SECTION