SPEC WRITERS NOTE: This specification includes materials and installation procedures for **VaproSmart ICL,** a high-performance interior air barrier and vapor control layer with a variable vapor permeability membrane. **VaproSmart ICL** sheet membrane is used on the interior to control vapor diffusion and as an air barrier.
VaproSmart ICL is an interior air barrier and smart vapor retarder sheet membrane. It dynamically adjusts to mitigate moisture vapor based on the surrounding humidity levels, allowing moisture to escape while simultaneously protecting the interior wall cavity. This guide specification should be adapted to suit the requirements of individual projects. It is prepared in CSI Master Format and should be included as a separate section under Division 7 – Air and Vapor control.

SECTION 07 26 00

INTERIOR AIR AND VAPOR CONTROL MEMBRANE

PART 1 - GENERAL

1.1 GENERAL REQUIREMENTS

A. All of the Contract Documents, including General and Supplementary Conditions and Division 1 General Requirements, apply to the work of this section.

B. Examine all Drawings and all Sections of the Specifications for requirements and provisions affecting the work of this Section.

1.2 DESCRIPTION OF WORK

A. The work of this Section includes furnishing and installation of interior air barrier and vapor control layer at interior wall assemblies, at locations indicated on Drawings and elsewhere as noted and as required by code.

B. The work of this Section also includes furnishing and installation of flashing membranes to bridge gaps, for transition areas around windows, curtain wall, louvers, roof to wall interface, and elsewhere as indicated or required by code to provide a continuous air barrier assembly. Locations include, but are not limited to, the following:
1. Connection of the walls to the roof membrane
2. Connections of the walls to the foundations
3. Seismic and expansion joints
4. Openings and penetrations of window and door frames, storefront, and 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

C. Provide the material and work of this Section required to complete mock-up panel(s). Refer to exterior elevations for the extent of mock-up panels.

1.3 RELATED WORK SPECIFIED ELSEWHERE

A. Carefully examine all of the Contract Documents for requirements that affect the work of this section.

B. Other specifications sections which directly relate to the work of this section include, but are not limited to, the following:
1. Section 072000 – Thermal Protection
2. Section 072600 – Vapor Retarders
3. Section 072700 – Air Barriers
4. Section 072719 - Plastic Sheet Air Barriers

1.4 REFERENCE STANDARDS

A. The American Association of Textile Chemists and Colorists (AATCC) - Test Method for Water Resistance: Hydrostatic Pressure Test.

B. ASTM International (ASTM):
1. ASTM D828 - Standard Test Methods for Vulcanized Rubber and Thermoplastic Elastomers—Tension.
2. ASTM E96 - Test Methods for Water Vapor Transmission of Materials.
3. ASTM E283 - Standard Test Method for Determining Rate of Air Leakage Through Exterior Windows, Curtain Walls, and Doors Under Specified Pressure Differences Across the Specimen.
4. ASTM E2178 - Standard Test Method for Air Permeance of Building Materials.
5. ASTM F1249 - Standard Test Method for Water Vapor Transmission Rate Through Plastic Film and Sheeting Using a Modulated Infrared Sensor.

C. National Standards of Canada / Canadian General Standards Board (CAN/CGSB) 51.33 M89 Vapour Barrier Sheet, Excluding Polyethylene, for Use in Building Construction.

D. CDPH/EHLB Standard Method for the Testing and Evaluation of Volatile Organic Chemical Emissions from Indoor Sources Using Environmental Chambers.

1.5 SUBMITTALS

A. Submit manufacturers' current product data for the interior air barrier and vapor control layer with variable vapor permeability membrane components and accessories.
1. Manufacturer's sample warranty.
2. Installation instructions and recommendations.
3. Storage and handling requirements and recommendations

B. Submit samples of the following:
1. VaproSmart ICL, a high-performance interior air barrier and vapor control layer with a variable vapor permeability membrane, minimum 8 by 10 inches (203 by 254 mm).
2. Accessory components.
3. Sealants (included by others) required to provide a complete air barrier membrane system.

Delete section C if not pursuing LEED certification.

C. LEED Submittals:
1. Integrative process [IP] has a 1 pt. potential. VaproShield encourages this through preconstruction planning for 'building envelope attributes'.
2. Energy and Atmosphere [EA].
Minimum Energy requirement prerequisite and performance points – by providing a complete air barrier system: up to 18 pts.
Commissioning (i.e., BECx): Energy load reductions, Indoor Environmental Quality, and longevity of building components, which are required to satisfy the prerequisite if commissioning/verification for building envelope is chosen as a path before DD. Envelope Commissioning may qualify for an additional 2 pts, on top of the 4 pts via building energy simulation (enhanced commissioning), or complying with the prescriptive paths in ASHRAE 90.1-2010
3. Awareness and Education [AE] and/or Innovation [IN/ID]
Applies to projects that offer both a case study and an educational outreach program, which use the project as an example. 1 pt. available.

1.6 QUALITY ASSURANCE

A. Single Source: Obtain self-adhered water-resistive vapor-permeable air barrier and vapor control membrane components and accessories from a single-source membrane system manufacturer to ensure total system compatibility and integrity.

B. Manufacturer Qualifications:

1. Company specializing in manufacturing and supply of air barrier and vapor control layer products specified in this Section with a minimum [**10**] ten years' experience and successful installations in similar project applications.
2. Provide the manufacturer's experienced in-house technical and field observation personnel qualified to provide technical support.

C. Applicator:
1. Company specializing in performing Work of this Section with a minimum [3] three years' experience.

Include a mock-up if the project size and/or quality warrant such a precaution. Consider all corner connections and other complications, including sequencing that may disrupt the interior airtight vapor control layer.

1.7 MOCK-UP

A. Construct mock-up in accordance with Section 01 43 39 - Mock-up, or as specified under General Requirements Section 01 10 00.

B. Provide mock-up for evaluation of installation techniques and application workmanship.
1. Before installation of the airtight and vapor control layer, mock up the airtight and vapor control layer as follows to verify details and to demonstrate connections to adjoining construction elements, and other termination conditions.
2. Install a mockup of an airtight and vapor control layer in the location designated by the architect.
3. Do not proceed with the remaining work until workmanship and application technique are approved by the Architect.
4. Construct a typical interior wall, 8 feet wide by 8 feet long, illustrating materials interface and connections (tape, adhesives, gaskets), incorporating specified options, including but not limited to the following:
5. junctions of walls, foundations, ceilings, floors, and roof
6. corner conditions
7. window and doorframe connections
8. insulation seals/battens
9. Coordinate the construction of mockups to permit inspection and testing of the airtight and vapor control layer, along with the interfacing window, penetrations, before interior covering are installed.

1.8 PRECONSTRUCTION MEETING

A. Preconstruction Meeting: Convene a meeting with all subcontractors affected by the Work of this Section, a minimum of one week before commencing work of this section. The agenda shall emphasize that the success during the blower door test is dependent on the collaboration of all subcontractors.

B. Coordinate Work with other subcontractors (plumbers, electricians, carpenters, HVAC), operations, and installation of finish materials to install correctly-sized gaskets on pipes, ducts, and cable when these elements pass through the interior airtight and vapor control layer, and to avoid damage to installed materials. Before they commence work on site, provide each affected trade with sufficient gaskets

C. Agenda includes the following:
1. Review of approved submittals.
2. Review of mock-ups.
3. Coordination with the sequence of installation with adjacent materials.
4. Schedule for subsequent work covering the airtight and vapor control layer.
5. Procedures for quality assurance.

1.9 DELIVERY, STORAGE AND HANDLING

A. Refer to the current Product Data Sheet, Installation Instructions, and Safety Data Sheets (SDS) at www.vaproshield.com 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 pallets, in clean and dry areas, not exposed to direct sunlight, and in accordance with the manufacturer's instructions.

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

1.10 ENVIRONMENTAL CONDITIONS

A. Maintain environmental conditions (temperature, humidity, and ventilation) as per the manufacturer's recommendations. Do not install products under environmental conditions outside the manufacturer's absolute limits.

B. Minimize exposure to water.

1.11 WARRANTY

A. Provide manufacturer’s standard material warranty in which the manufacturer agrees to provide replacement material for the airtight and vapor control membrane installed in accordance with the manufacturer's instructions that fail due to material defects within [20] Twenty years from the date of Substantial Completion.

PART 2 - PRODUCTS

2.1 MANUFACTURE

A. Acceptable Manufacture: VaproShield. Website https://vaproshield.com/

B. Air-tight vapor control system, VaproSmart ICL.
1. Description: Smart vapor retarder made from polyamide film combined with a protective nonwoven layer membrane:
a. Color: White translucent green print.
b. Physical Dimensions: 0.008 inches (0.2 mm) thick and 59" x 98” (1.5 m x 30 m) and 9.8' x 98' (3 m x 30 m).
c. Dry Tensile strength to ASTM D828: machine direction: 2.7 N/mm (15 lbf/in), cross-machine direction: 1.9 N/mm (11 lbf/in).
d. Pliability to CAN/CGSB 51.33 M89: no cracking.
e. Water Vapor Permeance tested to ASTM E96 desiccant method, procedure A: 0.355 perms (20 ng/Pa•s•m^2).
f. Water Vapor Permeance tested to ASTM F1249, 0-50% RH @ 23°C: 0.34 Perm (grain/h•ft^2•inchHg) 19 ng/Pa•s•m^2).
g. Air Leakage: 0.0017 L/s•m^2 @ 75 Pa (<0.0003 cfm/ft^2 @ 1.57 psf) when tested in accordance with ASTM E2178.
h. Water Resistance tested to AATCC 127, 550 mm hydrostatic head for 5 hours: No leakage

C. Optional exterior Water and Air-tight control systems.
1. Description: Exterior Air-Tight, water-resistant barriers (WRB):
a. WrapShield SA, PanelShield SA, RevealShield SA, CanShield VP or BlockShield SA

2.2 ACCESSORIES

A. VaproAirSeal™

1. An air and water-tight sealant for perimeter and penetration sealing.

B. VaproFlashing SA
1. An air and vapor barrier for seam and penetration sealing.
Pass: CDPH/EHLB/Standard Method V1.2 (Sect. 01350) VOC test.

2.3 PENETRATION SEALANT

A. A. Provide sealant for penetrations as recommended by the manufacturer and as specified under Division 07 Section: Sealants. Appropriate sealants shall be VaproAirSeal™ or VaproFlashing SA.

PART 3 - EXECUTION

3.1 EXAMINATION

B. Verify that surfaces and conditions are ready to accept the work of this section. Notify [Envelope Consultant] [Engineer] [Architect] [Construction Manager] in writing of any discrepancies. Commencement of the work or any parts thereof shall mean acceptance of the prepared substrates.

C. Ensure substrates/surfaces have been properly prepared and cleaned of dust, silicones, oils, and grease. Before installation, verify the substrate is free of splinters, nails, or other objects that could puncture membranes.

D. Ensure all preparatory work is complete before applying the airtight and vapor control layer membrane.

E. If floor, walls, or ledger boards have been built that interfere with the airtight and vapor control layer and a drawn/planned pre-installed airtight and vapor control membrane was not installed as per the sequencing plan, notify the architect of unsatisfactory preparation before proceeding

3.2 PREPARATION

A. Download Installation Instructions at http://vaproshield.com/public-documents/installation-instructions.

B. Installation Summary:
1. Clean and prepare surfaces to receive airtight and vapor control membrane in accordance with the manufacturer's installation guidelines.
2. All surfaces must be clean, smooth, and dry and must be free of oil, dust, and silicone.
3. Batt installation: install the membrane immediately after the batt insulation is installed in winter.
4. Properly ventilate the space or use a dehumidifier to prevent high humidity conditions after concrete pours, sheetrock compounding, and tile work. Monitor humidity if needed to ensure it stays below 60% relative humidity.

3.3 APPLICATION

A. Apply an airtight layer/vapor retarder in accordance with the manufacturer's instructions.

B. Install membranes taut and without creases along the substrate.

C. Overlap subsequent courses of membrane. Use the printed lines on the membrane as a guide.

D. Tape all overlaps. Use a roller tool to ensure there is sufficient pressure when applying sheathing tapes. Make sure that tape joints are not permanently under stress, i.e., are supported by a batten or by cross-taping the taped joint with 12” long pieces of tape every 12”.

E. Overlap the membrane a minimum of 2” over dissimilar airtight materials (concrete, plaster).

F. Use VaproAirSeal to adhere membranes to concrete, brick, plaster, or rough OSB. Leave some slack in the membrane to allow for expansion and contraction between these dissimilar materials.

G. If taping the membrane to a porous or unknown substrate, they should be free of oil, silicone, and dust. Perform an adhesion test to ensure proper adhesion.

H. Seal membrane to windows, joist and beams with VaproAirSeal, airtight sheathing tape, or VaproFlashing SA. Follow the application guides of specific tapes.

I. Seal all penetrations with gaskets taped with airtight sheathing tape, VaproFlashing SA and/or VaproAirSeal to provide a continuous airtight layer. Air seal around pre-existing penetrations.

J. Apply blown-in insulation directly after installing the interior airtight and vapor control membrane.

K. Inspect membrane before blower door test and/or dense-packing insulation. Ensure”
1. Each overlap is taped
2. Staples or fasteners applied at appropriate intervals
3. Counter battens at recommended distances
4. Tears and punctures repaired with sheathing tape and/or VaproAirSeal
5. Adhesives have cured for 48 hours before the test.

3.4 PROTECTION

A. Protect the installed membrane until completion of the project.

B. Repair tears, punctures, or burns and/or replace damaged membrane before covering.

C. To protect the interior airtight and vapor control membrane, apply service cavity insulation and sheetrock as soon as possible, and not later than the specified exposure limit of used materials. Use tarps or other means of blocking UV if exposure times will be exceeded to protect membranes.

3.10 FIELD QUALITY CONTROL

A. Make notification when sections of work are complete to allow review before covering the air tight and vapor control membrane system.

B. Owner to engage an independent consultant to observe substrate and membrane installation before placement of cladding system(s) and provide written documentation of observations.

3.11 END OF SECTION