GUIDE SPECIFICATION FOR PERMINATOR® EVOH UNDERSLAB GAS AND VAPOR BARRIER

SECTION 07 26 16

Below Grade Vapor Retarders

Revision Date: July 3, 2019

Specifier Notes: This guide specification is written according to the Construction Specifications Institute (CSI) MasterFormat. The section must be carefully reviewed and edited by the architect or engineer to meet the requirements of the project. Coordinate this section with other specification sections and the drawings.

Specifier Notes: PERMINATOR EVOH is a seven-layer co-extruded barrier manufactured from state-of-the-art polyethylene and EVOH resins. Designed to provide superior resistance to gas and moisture transmission, as well as water vapor, PERMINATOR EVOH is a highly resilient underslab gas/vapor barrier designed to restrict naturally occurring gases, such as radon, methane, gasoline, solvents, oils, and hydrocarbons, from migrating through the ground and into the concrete slab.

When properly installed, PERMINATOR EVOH resists gas and moisture migration into the building envelope to provide protection from toxic/harmful chemicals. It can be installed as part of a passive or active control system extending across the entire building, including floors, walls, and crawl spaces. PERMINATOR EVOH protects flooring and other moisture-sensitive furnishings in the building's interior from moisture and water vapor migration, greatly reducing condensation, mold, and degradation.

PART 1 GENERAL

1.01 SECTION INCLUDES

A. Surface preparation.

B. Application of an underslab soil gas barrier.

1.02 RELATED SECTIONS

Specifier Notes: Edit the list of related sections as required for the project. List other sections dealing with work directly related to this section.

A. Section 03 30 00 - Concrete.

B. Section 07 10 00 – Dampproofing and Waterproofing.

C. Section 09 64 00 - Wood Flooring.

D. Section 09 65 00 - Resilient Flooring.

1.03 REFERENCES

A. ASTM D1434: Standard Test Method for Determining Gas Permeability Characteristics of Plastic Film and Sheeting.

B. ASTM D1709: Standard Test Methods for Impact Resistance of Plastic Film by the Free-Falling Dart Method.

C. ASTM E96: Standard Test Methods for Water Vapor Transmission of Materials.

D. ASTM E154: Standard Test Methods for Water Vapor Retarders Used in Contact with Earth Under Concrete Slabs.

E. ASTM E1643: Standard Practice for Installation of Water Vapor Retarders Used in Contact with Earth or Granular Fill Under Concrete Slabs.

F. ASTM E1745: Standard Specification for Plastic Water Vapor Retarders Used in Contact with Soil or Granular Fill Under Concrete Slabs.

G. ASTM F1249: Standard Test Method for Water Vapor Transmission Rate Through Plastic Film and Sheeting Using a Modulated Infrared Sensor.

H. K124/02/95: Determination of Radon Transmittance.

1.04 SUBMITTALS

A. Comply with Section 01 33 00 - Submittal Procedures.

B. Submit manufacturer's product data and application instructions.

1.05 QUALITY ASSURANCE

A. Use an experienced installer and adequate number of skilled personnel who are thoroughly trained and experienced in the application of the soil gas barrier.

B. Obtain gas barrier materials from a single manufacturer regularly engaged in manufacturing the product.

C. Provide products which comply with all state and local regulations controlling use of volatile organic compounds (VOCs).

1.06 PRECONSTRUCTION MEETING

A. Pre-Construction Meeting: Convene one week prior to installation of underslab soil gas barrier. Attendees to be as follows: - Architect, Engineer, General Contractor, Gas Barrier Installer, and Gas Barrier Manufacturer to discuss the installation in detail.

1.07 DELIVERY, STORAGE, AND HANDLING

A. Deliver materials to site in manufacturer's original, unopened containers and packaging, with labels clearly identifying product name and manufacturer.

B. Store materials in a clean, dry area in accordance with manufacturer's instructions.

C. Protect materials during handling and application to prevent damage or contamination.

D. Ensure membrane is stamped with manufacturer’s name, product name, and membrane thickness at intervals of no more than 85” (220 cm).

1.08 ENVIRONMENTAL REQUIREMENTS

A. Product not intended for uses subject to abuse or permanent exposure to the elements.

B. Do not apply on frozen ground.

PART 2 PRODUCTS

2.01 MANUFACTURER

A. W. R. MEADOWS®, INC., PO Box 338, Hampshire, Illinois 60140-0338. (800) 342-5976. (847) 683-4500. Fax (847) 683-4544. Web Site www.wrmeadows.com.

2.02 MATERIALS

A. Soil Gas Barrier
1. Performance-Based Specification: Gas barrier membrane shall be a seven layer co-extruded barrier manufactured from polyethylene and ethylene vinyl alcohol (EVOH) resins, meeting the shall meet the following minimum performance requirements:
a. Maximum Water Vapor Permeance (ASTM E154 Sections 7, 8, 11, 12, 13, by ASTM E96, Method B or ASTM F1249)
i. As received: 0.0098 perms.
ii. After Wetting and Drying: 0.0079 perms.
iii. Resistance to Plastic Flow and Temperature: 0.0079 perms.
iv. Effect Low Temperature and Flexibility: 0.0097 perms.
v. Resistance to Deterioration from Organisms and Substances in Contacting Soil: 0.0113 perms.
b. Puncture Resistance, ASTM D1709: 2,600 grams.
c. Tensile Strength, ASTM E154, Section 9: 58 Lb. Force/Inch.
d. Radon Diffusion Coefficient, k124/02/95: $<1.1 \times 10^{-13}$ m^2/s.
e. Methane Permeance, ASTM D1434: 3.68×10^{-12} GTR.
f. Aqueous Phase Film Permeance
i. Benzene Permeance: 1.57×10^{-10} m/s.
ii. Toluene Permeance: 2.18×10^{-10} m/s.
iii. Ethylbenzene Permeance: 1.71×10^{-10} m/s.
iv. M & P Xylenes Permeance: 1.62×10^{-10} m/s.
v. O Xylene Permeance: 1.53×10^{-10} m/s.

2. Proprietary-Based Specification:
a. PERMINATOR EVOH by W. R. MEADOWS.

2.03 ACCESSORIES

Specifier Notes: When PERMINATOR EVOH is to be used strictly as a water vapor barrier, only the PERMINATOR EVOH Tape is required to be used. In situations where the PERMINATOR EVOH is to be used as a soil gas barrier, PERMINATOR EVOH BUTYL TAPE is installed within a 12” (304.8 mm) overlap and then the seam is then taped with PERMINATOR EVOH Tape. Select accessories based on project requirements.

A. Seam Tape
1. High Density Polyethylene Tape with pressure sensitive adhesive. Minimum width 4” (100 mm).
a. PERMINATOR EVOH TAPE by W. R. MEADOWS.

B. Double Sided Seam Tape
1. Double sided butyl tape for overlap sealing in gas barrier installations. Minimum width 2” (50 mm).
a. PERMINATOR EVOH BUTYL TAPE by W. R. MEADOWS.

C. Pipe Collars
1. Construct pipe collars from gas barrier material and pressure sensitive tape per manufacturer’s instructions.

PART 3 EXECUTION

3.01 SURFACE PREPARATION

Specifier Notes: A base for a gas-reduction system may require a 4” - 6” (101. 6 – 152.4 mm) gas permeable layer of clean coarse aggregate as specified by architectural or structural consultant after installation of the recommended gas collection system. In this situation, a cushion layer consisting of a non-woven geotextile

fabric placed directly under PERMINATOR EVOH will help protect the barrier from damage due to possible sharp coarse aggregate. Surface preparation needs to be reviewed based on the specific project requirements.

A. Prepare surfaces in accordance with project requirements.

Specifier Notes: It may also be advisable to reference American Concrete Institute (ACI) 302.1R-15: Chapter 6, Section 6.1.4 – Base Material, for sub-grade preparation prior to placement of PERMINATOR EVOH. As this is a guide, reference to this document shall not be made in contract documents and any items in this document that the Architect/Engineer wants to be part of the contract documents, the items need to be reinstated in mandatory language for incorporation by the Architect/Engineer.

B. Level, tamp, or roll earth or granular material beneath the slab base.

3.02 EXAMINATION

A. Examine surfaces to receive membrane. Notify architect if surfaces are not acceptable. Do not begin surface preparation or application until unacceptable conditions have been corrected.

3.03 INSTALLATION

Specifier Notes: If PERMINATOR EVOH is being used as strictly a vapor barrier, then delete Section B below. If the requirement is for PERMINATOR EVOH to be used as a soil gas barrier for contaminated site installation, then delete Section A. It is also advisable to review the PERMINATOR EVOH Installation Guidelines for additional installation information that may be specific for the project requirements.

A. Vapor Barrier

1. Install the vapor barrier membrane in accordance with manufacturer's instructions and ASTM E1643.

2. Unroll vapor retarder with the longest dimension parallel with the direction of the pour.

3. Lap vapor barrier over footings and seal to foundation walls with 4" (100 mm) seam tape.

4. Overlap joints 6" (152 mm) and seal with 4" (100 mm) seam tape and roll press into place.

5. Seal all penetrations (including pipes) with manufacturer's written installation procedures.

6. No penetration of the vapor retarder is allowed except for reinforcing steel and permanent utilities.

7. Repair damaged areas by cutting patches of vapor barrier, overlapping damaged area 6" (150 mm) and taping all four sides with tape.

B. Soil Gas Barrier

1. Install the gas barrier membrane in accordance with manufacturer's instructions and ASTM E1643.

2. Unroll gas barrier membrane with the longest dimension parallel with the direction of the pour.

3. Lap gas barrier over the footing and seal to foundation walls with 2” (50 mm) double sided butyl tape and roll press into place with rubber roller.

4. Apply gas barrier seam tape to the terminated edge of the gas barrier membrane and onto the concrete foundation.

5. Roll press into place.

4. Joint Overlap
   a. Apply double sided butyl tape 6” (150 mm) from the termination of the gas barrier membrane and press into place.
   b. Overlap the next layer of gas barrier membrane 12” (300 mm) and roll press into place.
   c. Apply gas barrier seam tape centered over the joint and roll press into place.

5. Repair of Damaged Areas
   a. Cut out damaged area of gas barrier membrane allowing for an overlap of 12” (300 mm) in all directions.
   b. Apply double sided butyl tape 6” (150 mm) from the cut edges of the gas barrier membrane in all directions and press into place.
   c. Place the new piece of gas barrier membrane overlapping the existing areas a minimum of 12” (300 mm) and roll press into place.
   d. Apply 4” (100 mm) gas barrier seam tape centered over the joint in all directions and roll press into place.

END OF SECTION