

SECTION 312113

BELOW-GRADE RADON RETARDERS

PRODUCT AND SYSTEM GUIDE SPECIFICATION Environmentally Safe Products, Inc. (ESP) Low-E SlabShield® Below-grade vapor and radon (and other) gas retarder. The intent of this guide specification from the manufacturer is to assist the specifier in the correct specifying of the ESP Low-E SlabShield® product for residential and commercial building types. ESP manufactures a complete line of both residential and commercial reflective insulation products. Low-E SlabShield is a flexible insulation blanket comprised of two layers of polyethylene foam laminated either side to a layer of scrimless aluminum foil. It can be used as a below-grade radon retarding vapor barrier that is also insulating. The specifier must edit this guide specification to fit project specific requirements. Contact an ESP specialist for additional assistance and current information. 1-800-289-5693. Throughout this guide specification, there are specific notes to assist in editing of the text: [**BOLD TEXT**] within square brackets means options, where a choice needs to be made. Remove brackets and unbold text. < TEXT > in angle brackets means a choice needs to be inserted. Remove brackets and unbold text. Coordinate cross references to other specification sections with the actual specification section numbers or Division numbers and titles used for the project. Please note that ESP will not be held responsible for edited versions of this specification used for individual projects.

PART 1 - GENERAL

1.1 SUMMARY

A. Section Includes:

1. Insulating, radon- and vapor-retarding sheet membrane installed below concrete slabs on grade.

Specifier Note:
Select all that apply and or add others that apply.

B. [Related Requirements]

1. [Division 03 Sections for concrete slabs on grade.]

Environmentally Safe Products, Inc. (ESP)

1.2 REFERENCES

A. Definitions:

1. Vapor Retarder: A material that is intended to retard the transmission of water vapor under specific conditions.
2. Radon Retarder: A material that is intended to retard the transmission of radon and act as a passive radon control or as part of an active and passive radon control system.

B. Reference Standards:

1. ASTM C518; Standard Test Method for Steady-State Thermal Transmission Properties by Means of the Heat Flow Meter Apparatus.
2. ASTM E96; Standard Test Method for Water Vapor Transmission of Materials.
3. ISO/TS 11665; Measurement of radioactivity in the environment — Air: radon 222 — Part 13: Determination of the diffusion coefficient in waterproof materials: membrane two-side activity concentration test method.

1.3 PREINSTALLATION MEETINGS

Specifier Note:

Select default or insert a new number of days for preinstallation meeting

- A. Meet at Project site [7] **<Insert number>** days before starting installation.

Specifier Note:

Select all that apply and add any additional required attendees. Division 01 normally requires Contractor, Architect and Owner attend preinstallation meetings. Otherwise, add them to the list

- B. Required Attendees: Concrete subcontractor, **[installer of snow-melting system,]** other affected trades.

1.4 ACTION SUBMITTALS

- A. Product Data: Current technical literature and construction details.

Specifier Note:

Larger samples available. Change the minimum size as required.

- B. Samples: Insulating radon- and vapor-retarding membrane, minimum **4 inches by 6 inches (100 by 150 mm)**. Demonstrate shiplap.

Specifier Note:

Retain following article / paragraphs if required for any sustainable requirements. Coordinate final requirements with Division 01. Add additional sustainable requirements not listed. Check also manufacturer's website for current information.

1.5 [SUSTAINABILITY SUBMITTALS

A. LEED Documentation Submittals:

1. Potential Credits:

- a. **SS Prerequisite, Construction Activity Pollution Prevention.**
- b. **EA Prerequisite, Minimum Energy Performance.**
- c. **EA Credit, Optimize Energy Performance.**
- d. **MR Credit, Building Product Disclosure and Optimization: Environmental product declarations documentation.**
- e. **MR Credit, Building Product Disclosure and Optimization: Sourcing of raw materials documentation.**
- f. **MR Credit, Building Product Disclosure and Optimization: Material ingredients documentation.**
- g. **EQ Prerequisite, Minimum Air Quality Performance.**
- h. **EQ Credit, Low-Emitting Materials.**
- i. **EQ Credit, Indoor Air Quality Assessment**
- j. **EQ Credit, Thermal Comfort.**
- k. **IN Credit, Innovation.]**

B. [Enterprise Green Communities criteria for building certification.]

C. [Green Globes Sustainable criteria for building certification.]

D. [Well Building Standard criteria for building certification.]

1.6 INFORMATIONAL SUBMITTALS

A. Qualification statements for installer.

1.7 CLOSEOUT SUBMITTALS

A. General Submittal Procedures: Division 01.

1.8 QUALITY ASSURANCE

A. Qualifications:

- 1. **Installers: A firm experienced in applying below-slab radon and vapor retarder materials similar in design, material, application and extent to those indicated for this project, whose work has resulted with a record of successful service performance.**

1.9 DELIVERY, STORAGE, AND HANDLING

A. Delivery and Acceptance Requirements:

- 1. **Deliver insulating, vapor-retarding sheet materials in manufacturer's original, unopened and undamaged packaging.**

B. Storage and Handling Requirements:

Environmentally Safe Products, Inc. (ESP)

1. Store products sheltered from adverse weather conditions inside their sealed original packaging until installation. Keep away from direct sunlight, high temperatures, ignition sources and heating equipment.

1.10 FIELD CONDITIONS

- A. Ambient Conditions: Perform work within following limitations.

1. Building enclosed and environmental systems maintaining design conditions for Owner occupancy.
2. Temperature: Avoid temperatures above 158 degF (70 degC).

1.11 WARRANTY

- A. Manufacturer Warranty:

1. Warranty Period: 20 years for materials and workmanship.

PART 2 - PRODUCTS

2.1 MANUFACTURERS

- A. Acceptable Manufacturer: Environmentally Safe Products, Inc.; ESP Low-E SlabShield.

1. Contact ESP:

- a. 313 W. Golden Lane. New Oxford, Pennsylvania 17350.
- b. Telephone: 717-624-3581, Toll Free: 1-800-289-5693.
- c. Fax: 717-624-7089.
- d. Email: sales@low-e.com
- e. Website: <http://www.low-e.com/>

Specifier Note:

Select the one that applies

- B. Substitutions: [See Division 01] [Not permitted].

2.2 PERFORMANCE

- A. Assembly R-Value: ASTM C518; R-2.9, including 4" aggregate base.

- B. Product R-Value: ASTM C518; R- 1.6.

- C. Radon Permeability: ISO/TS 11665:

1. Radon Diffusion Coefficient: 3.2×10^{-14} m²/second.
2. Radon Diffusion Length: 1.2×10^{-4} meters.
3. Radon Resistance: 3400 Ms/m.

Environmentally Safe Products, Inc. (ESP)

- D. Water Vapor Permeance: ASTM E96; **0.0028 perms** (0.16 ng/Pa x s x sq. m), maximum.
- E. Puncture Resistance: TAPPI Beach T 803; **90 psi** (620 kPa), minimum.

2.3 INSULATING, RADON- AND VAPOR-RETARDING MEMBRANE

- A. Radon- and Vapor-Retarding Slab Insulation: Two layers polyethylene foam laminated to scrimless aluminum foil.

Specifier Note:

Product Code for 3/8 inch material is 4FSFB

- 1. Product Thickness: [**3/8 inch** (10 mm)], nominal.

2.4 ACCESSORIES

- A. Seam Tape: Membrane manufacturer recommended 4 or 6 inch wide butyl tape.
- B. Repair Tape: Membrane manufacturer recommended 12 inch wide butyl tape.

PART 3 - EXECUTION

3.1 EXAMINATION

- A. Examine the substrate and surface conditions.
- B. Ensure subsoil is level and compacted.

3.2 INSTALLATION

- A. Installation - General: Follow ASTM E1643.
- B. Follow membrane manufacturer written instructions and details to ensure continuity of radon- and vapor-tight system.
 - 1. Clean and prime concrete surfaces to ensure proper tape adhesion.
 - 2. Apply radon- and vapor-retarding membrane beneath entire slab. Seal membrane to foundation walls or other perimeter enclosing construction with butyl tape.
 - 3. Joints:
 - a. Shiplap edge joints 3 inches minimum and seal with seam tape.
 - b. Tightly butt end joints and seal with seam tape. Center tape on seam.
 - 4. Apply repair tape to seal columns, drains, conduits, pipes, and other items penetrating membrane.
 - 5. Repair damaged areas with additional membrane and repair tape.

Environmentally Safe Products, Inc. (ESP)

3.3 CLEANING

- A. Waste Management: Dispose of leftover material in AHJ-approved solid waste landfill. Follow all regulatory requirements for disposal.

3.4 PROTECTION

Specifier Note:

In concrete or hydronic heating specifications, note that only brick or flat-bottomed chair type supports should be used, to protect the membrane from puncture.

- A. Protect installed radon- and vapor-retarding membrane from damage until concrete slab is poured. Pour slab within 15 days or protect membrane from UV exposure.

END OF SECTION