NATURAL POLYMERS™

NATURAL-THERM® 2.0 HFO CLOSED CELL RADONBARRIER™ PERFORMANCE

Third-party tested for radon diffusion and infiltration

GREENGUARD

PRODUCT CERTIFIED FOR LOW CHEMICAL EMISSIONS
UL.COM/GG
UL 2818

GOLD

INSTALLATION GUIDE

RADON ABATEMENT FOR BELOW GRADE/BELOW SLAB INSULATION

OVERVIEW

This guide provides important information for the application of Natural-Therm® 2.0 HFO Summer/Winter products as a radon gas diffusion barrier in below-grade and below-concrete slab installations. Natural-Therm® 2.0 HFO products are nominal 2.0 lb./ft^3 density, closed cell spray foam systems that provide a continuous layer of rigid insulation and also serve as soil gas, water vapor, and liquid water barriers. Concerning the soil gas radon, Natural-Therm® 2.0 HFO has been thoroughly tested by third-party laboratories and shown to be a more effective radon gas retarder at a thickness of 2 inches rather than the traditional 6-mil polyethylene sheet.[1] The radon retarding performance, as well as many other benefits that below-slab applications of Natural-Therm® 2.0 HFO products can provide, is highly dependent on design and installation parameters, as well as overall requirements for the project. These topics will be covered in this guide.

PRODUCT FEATURES

- 376 times lower radon infiltration ratio* than 6-mil poly
- Excellent thermal performance at R-Value of 7.2 per inch
- Continuous air seal solution (tested in accordance with ASTM E2178)
- UL GREENGUARD GOLD certified

*Radon infiltration ratio is the percentage of radon concentrations in the receiving and dosing compartments of the RIBETS (Radon Infiltration Building Envelope Test System).

RADON: THE UNFAMILIAR KILLER

Radon is a radioactive gas that is odorless, colorless, and tasteless. It is produced by the breakdown of uranium found in sediment (soil), rocks, and water. When radon is released into the atmosphere, it gets diluted and poses negligible risk to human health. However, if radon accumulates inside a home, it can pose a serious health risk.

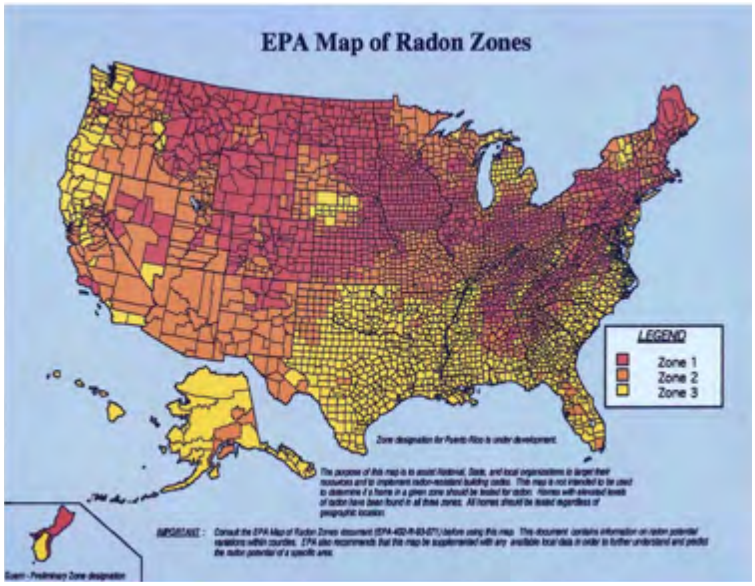
The EPA believes that any radon exposure carries some risk. No level of radon is safe, and even radon levels below 4 picocurie per liter (pCi/L) pose some risk. You can reduce your risk of lung cancer by lowering your radon level.[2]

- Radon is the number one cause of lung cancer among non-smokers, and the second leading cause of lung cancer overall.[2]
- The average indoor radon level is estimated to be about 1.3 pCi/L.[2]
- About 0.4 pCi/L of radon is normally found in the outside air.[2]

The U.S. Congress has set a long-term goal that indoor radon levels be no more than outdoor levels. While this goal is not yet technologically achievable in all cases, most homes today can be reduced to 2 pCi/L or below.[3]

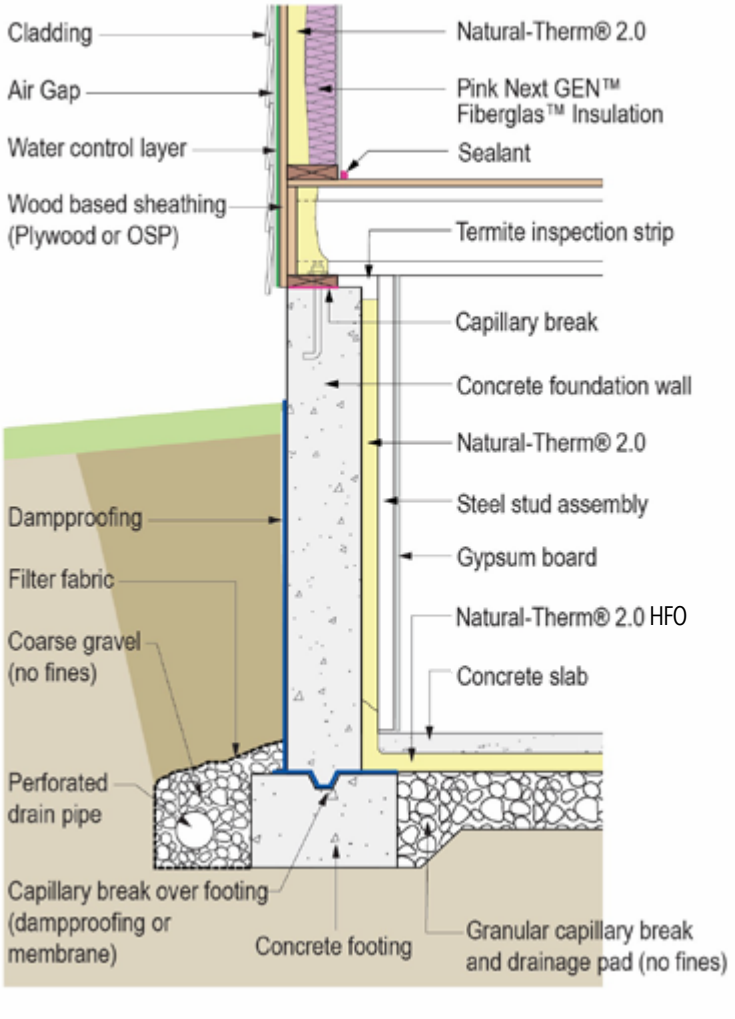
Radon can enter via cracks in the foundation walls and/or floor slabs. It can also enter through other openings, including:

- Unfinished floors (dirt)
- Construction joints
- Gaps around service pipes
- Support posts
- Window casements
- Floor drains
- Sumps
- Cavities inside walls



RADON MITIGATION

According to the US EPA, a systems approach with methods that prevent radon from entering the home or building has proven most effective at minimizing risk, although most methods result in some loss of heated or air-conditioned air, which leads to higher energy costs.[3] In these systems, the use of Natural-Therm® 2.0 HFO can play a more efficient role as a radon retarder than polyethylene sheet, providing reduced radon levels entering the home with excellent insulation properties. Less radon entering the home, coupled with greater control of temperature and humidity with Natural-Therm® 2.0 HFO, may enable reduced air exchanges and HVAC requirements. However, it should not be the sole means of controlling radon levels. A certified or qualified radon mitigation contractor should be consulted to assess the specific needs of each installation and determine what level of control measures are required.



NATURAL-THERM® 2.0 HFO INSTALLATION

Natural-Therm® 2.0 HFO can be applied to most surfaces in sub-grade and beneath-slab installations. For beneath-slab applications, the gravel base should be installed and properly compacted and leveled as in traditional slab pours. Natural-Therm® 2.0 HFO should not be installed over a sand base or fine aggregate. For best results, the gravel base should be relatively dry without standing water or excess moisture. Application of Natural-Therm® 2.0 HFO involves high pressure, so gravel should not contain excessive amounts of dust or fines that can become airborne. Removal by compressed air may be appropriate if needed.

- Natural-Therm® 2.0 HFO may be used as a soil-gas retarder, as an alternative to 6-mil (0.15 mm) polyethylene detailed in Section AF103.3 of the IRC to retard the flow of radon gas.
- Apply Natural-Therm® 2.0 HFO on top of the base course as defined in Section IRC 506.2, at a minimum thickness of 2 inches (50.8 mm), prior to casting the slab or placing the floor assembly.
- Natural-Therm® 2.0 HFO must be installed to fit closely around pipe, wire, or other penetrations when installed as a soil gas retarder.[4]

For additional detailed guidance about the application of Natural-Therm® 2.0 HFO SPF products, please consult the **Natural Polymers Closed Cell SPF Application Guide**.

[1] NRC A1-023490 (Dec 2023)
[2] epa.gov/radon/health-risk-radon (July 2024)
[3] epa.gov/sites/default/files/2016-12/documents/2016_consumers_guide_to_radon_reduction.pdf (July 2024)
[4] Code Evaluation Report IAPMO ER-714 (Mar 2024)

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