HUNTSMAN

BUILDING SOLUTIONS

Radon Protection

How It Works

Radon Protection from One of the World's Leaders in Spray Foam.

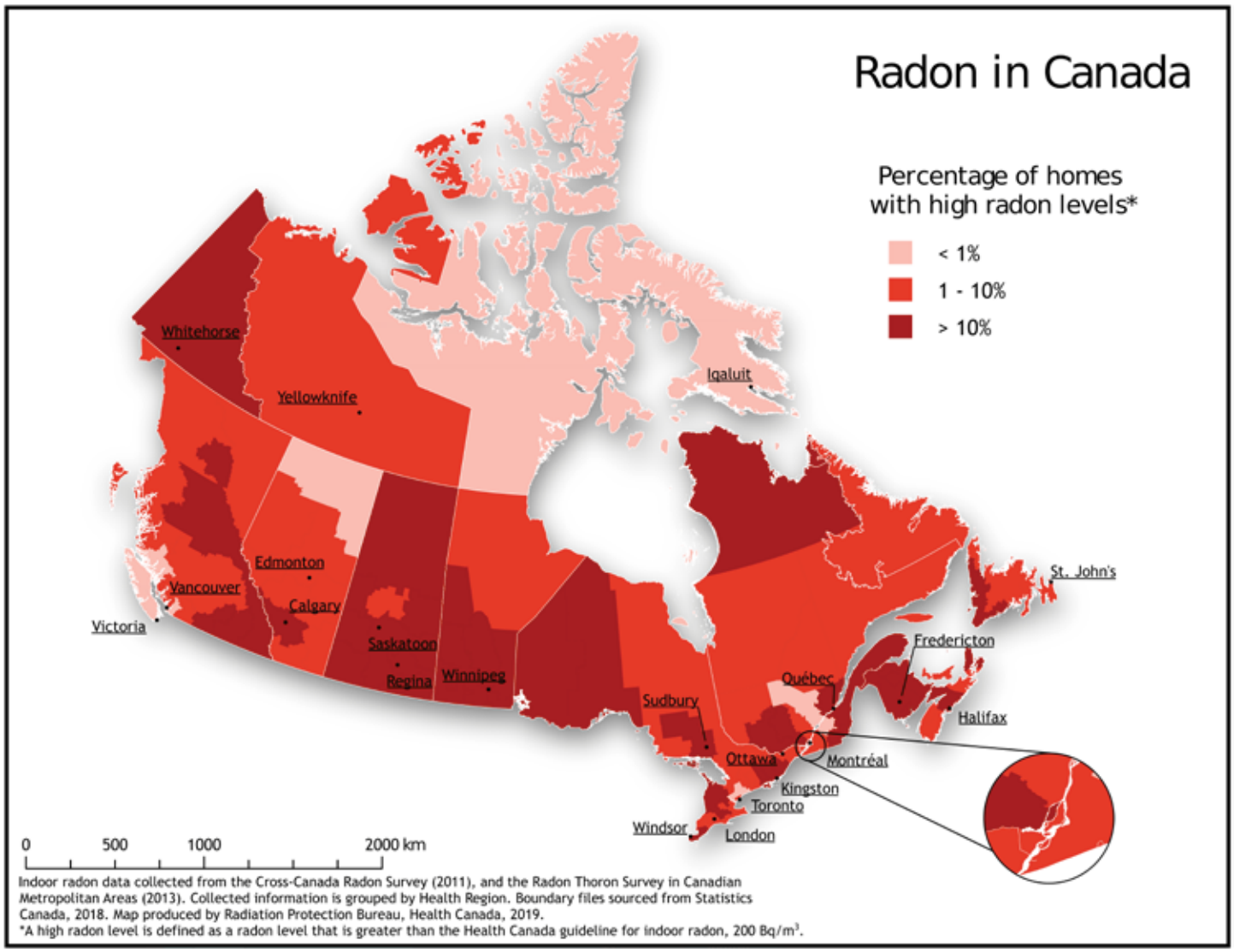
Heatlok Soya HP is Manufactured in Canada and contains 20% of recycled and renewable materials.

UL-ER47077-02

What is Radon?

Radon, a colorless, odorless, radioactive gas, is the second leading cause of lung cancer. Heavier than air, radon can accumulate in basements, increasing the risk of exposure to the homeowner.

Radon can infiltrate through several places, especially cracks or openings in the floor slab, cracks in the foundation wall, or sumps. The Environmental Protection Agency (EPA) and The Canadian Lung Association recommend testing for radon in your home.



This map was created using data collected from the Cross-Canada Radon Survey (2011) and the Radon Thoron Survey in Canadian Metropolitan Areas (2013). Collected information is grouped by Health Region. Boundary files are sourced from Statistics Canada, 2018.

Here are Health Canada's recommendations for reducing radon infiltration in basements:

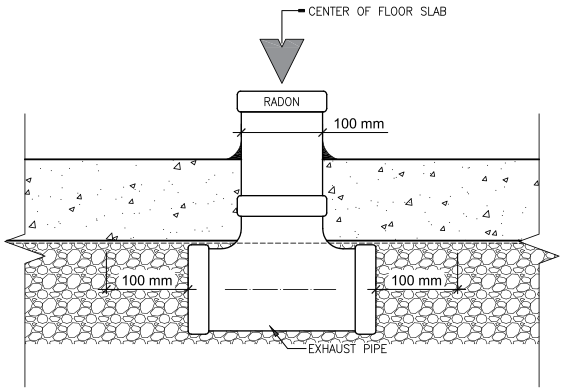
- Install a membrane or sealing product under the floor slab
- Seal the joint between the foundation wall and the floor slab
- Seal all openings in the foundation wall and floor slab
- Seal all posts and load-bearing walls to the floor slab and membrane
- Install floor drains that prevent gas infiltration
- Install sealed lid on sumps

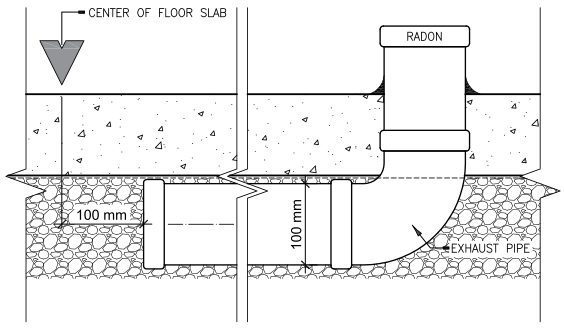
How to Build a Radon-Free Basement

These are the 6 steps to build a radon-proof basement in a new building:

1. Install A Depressurization Pipe

A perforated 4 inch diameter pipe must be installed in 3/4 inch gravel net and run to the center of the surface of the floor slab. This pipe is installed preventatively and will be connected to an exhaust fan if, after the work is completed, a test shows a radon concentration over the acceptable limit or 200 Bq/m^3.



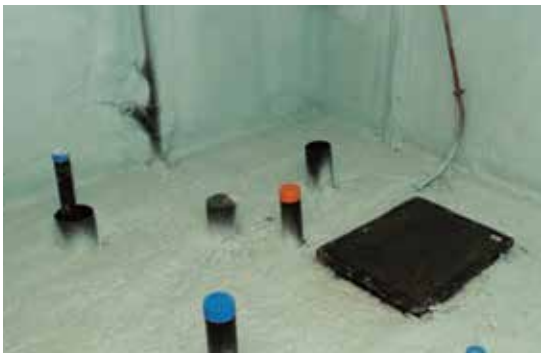


2. Install An Air Barrier

Heatlok Soya HP is an air-barrier product that exceeds CAN/ULC S741, CAN/ULC S742 and ASTM E2178 and UL evaluated specifically for this application, complying with the NBCC. The product provides perfect air-tightness under the foundation slab, as well as insulation. Heatlok Soya HP offers protection and resistance to Radon gas. An application of 38mm (1.5'') directly to the gravel is 19624 times more effective than a 6-mil polyethylene membrane. The minimum thickness is 38 mm to meet insulation, airtightness and vapour barrier requirements.

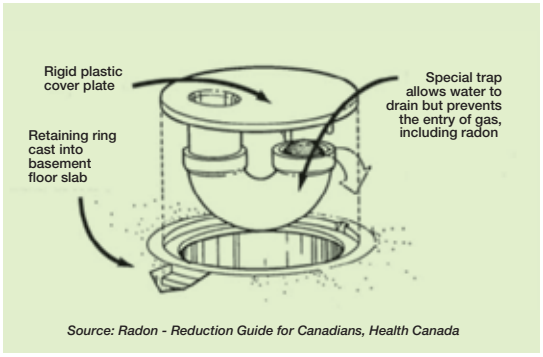
3. Seal The Joints

The perfect continuity of insulation achieved with Heatlok Soya HP seals all joints, providing seamless insulation from the slab to the foundation wall all the way up to the rim joist. The product is sprayed on-site and molds perfectly to the building structure. The continuity between the slab and the wall is perfect. The installation of Heatlok Soya HP requires no sealant, tape or cutting of materials, so there are no compatibility issues between materials.



4. Seal All Openings

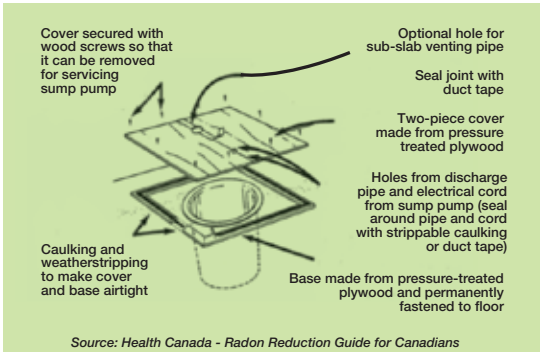
Heatlok Soya HP seals openings and posts, leaving no room for error. The product seals and expands 30 times its initial volume in 5 seconds.



Source: Radon - Reduction Guide for Canadians, Health Canada

5. Install Floor Drains

Radon can use water as a vehicle for infiltration. It is, therefore, important to install floor drains that are specifically designed to prevent gas infiltration.



Source: Health Canada - Radon Reduction Guide for Canadians

6. Install A Sealed Lid on Sumps

Sumps can communicate directly with the gravel. It is therefore important to use specifically designed sealed lids.

Protection Requirements

The basement can often be a high risk area: high humidity, floods, mold, etc. With the energy requirements of The National Building Code of Canada (NBCC-Table 9.36.2.8.-A), its is recommended to insulate under the basement concrete slab. The insulation performance must meet the local requirements where the building is constructed. In addition, NBCC requires the installation of protection against soil gases (sub-section 9.13.4 of the NBCC), mainly radon. Heatlok Soya HP provides superior insulation, a perfect air barrier system, and a vapour barrier all in one single application. It also prevents soil gases, mainly radon, from entering the building. In short, the occupants are warm, comfortable and protected from radon.

Depending on the thickness applied, Heatlok Soya HP exceeds Building Code requirements. The product is sprayed directly onto the gravel and provides continuous, seamless insulation. Heatlok Soya HP has very good compressive strength (37 psi).

During construction, workers can move with wheelbarrows and equipment without damaging Heatlok Soya HP; it will not crack or break. The entire basement can be sprayed in a single step. Application is very quick and generates no waste. No scraps, no wasted materials. In 2010, the Canadian government has changed the safety threshold for Radon gas in buildings. The requirements of the National Building Code of Canada, NBCC 2015 (Sub-Section 9.13.4) stipulate the installation of an air barrier system in basements to block infiltration of radon gas. In addition to its high insulation factor, Heatlok Soya HP acts as an air barrier & vapour barrier. 25 mm (1") of product exceeds the air barrier material and system requirements (CAN/ULC S741 et CAN/ULC S742). When applied, the product adheres and expands 30 times its initial volume in 5 seconds.

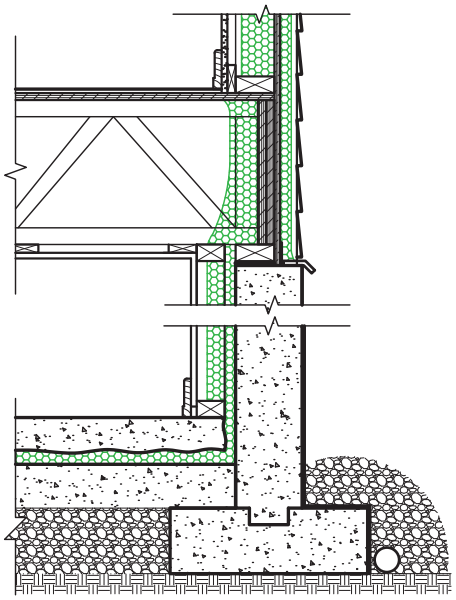
MINIMUM INSULATION VALUES REQUIRED FOR BASEMENT				
ONTARIO SB-12				
	Full Surface Below Grade Slab	**Edge of Below Grade Slab**	**Heated Slab or ≤ 600mm Below Grade**	**Basement Wall**
Zone 1 (<5000 HDD)	-----	R-10	R-10	R-12 R-20 [2]
Zone 2 (<5000 HDD)	R-5 [1]	R-10	R-10	R-12 R-20 R-22 [2]
Addition	-----	R-10	R-10	R-20
QUÉBEC PART 11				
(<6000 HDD)	R-5	R-4	R-10	R-17 [3]
BRITISH COLUMBIA PART 10				
Residential (<5 Stories)	R-5	R-4	R-10	R-17 [3]

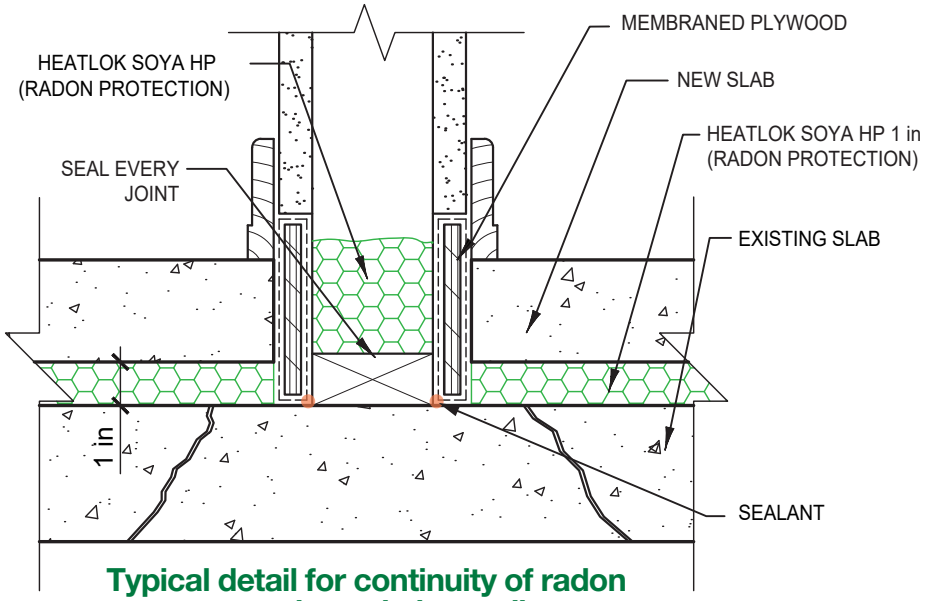
1 - Zone 2 table 2.1.1.3.A AFUE ≥ 90% compliance package B,C,E,F,G,I,J,K,L,M = R-0
2 - Depend on applicable compliance package
3 - Total R-17 with a minimum R-4 insulation thermal break structure 1RSI=5,678R
For more information see Typical Heatlok Soya HP Detail Wood Fraing Construction

Reference Article for Radon NBCC-2010, 2015 and 2020
5.4.1.1.1(e)-A 5.4.1.1 - 9.13.4 - 9.25.3 - 9.36.2.9

Renovation

A simple solution to prevent radon infiltration in existing buildings. Spray Heatlok Soya HP on the existing slab, the foundation wall, and the rim joist, and then pour a new slab. It is important to verify the floor/ceiling height, since this will add approximately 4” to the floor thickness.



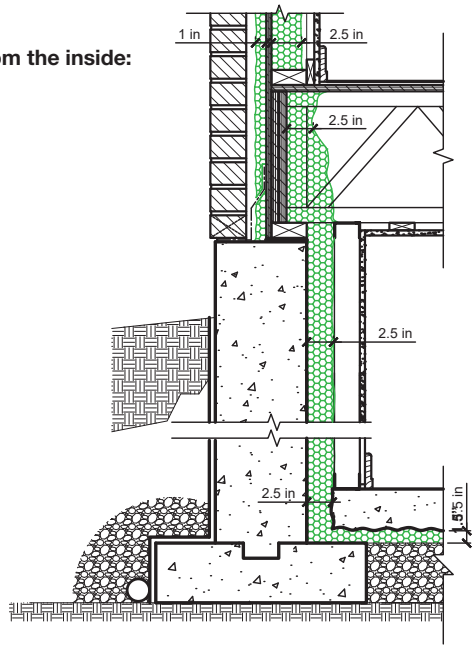


Typical detail for continuity of radon protection existing walls

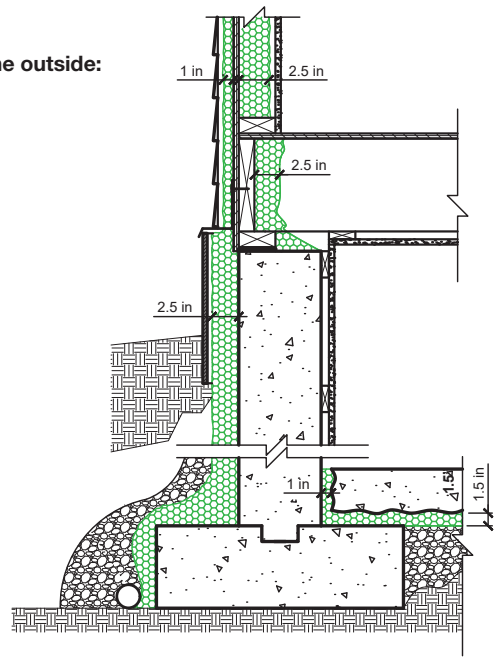
New Construction

Preventing radon gas infiltration in new construction is even simpler.

From the inside:



From the outside:



The Solution For Lasting Comfort

A basement is a high-humidity area prone to mold and mildew development. According to independent laboratory testing (ASTM C 1338), mold will not grow in Heatlok Soya HP, as it is not a nutrient source for bacteria. The product is water and humidity resistant. Numerous studies have shown that it is the ideal insulation for flood-prone areas, as it has the highest rating (class 5) for flood-resistant materials. The spray polyurethane foam may remain in place even after a flood. The foam does not degrade and, once dry, Heatlok Soya HP recovers all of its physical properties.

In short, the installation of Heatlok Soya HP under the slab and on foundation walls saves time and materials, while providing lasting superior-quality insulation and airtightness at a competitive price. Heatlok Soya HP is suitable for application on all building types and Its installation generates no waste or job site trash. The product is sold in liquid form in returnable or recycled containers, therefore there is no excess packaging.

To see the Radon performance test video, scan here

References

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3. Honeywell. Closed-cell spray foam: A better building technology. Severe Weather FEMA. (August 2008). Flood damage – Resistant Materials Requirements. Technical Bulletin #2. FEMA. (December 2010). Home Builder's Guide to Coastal Construction. Technical factsheet series. FEMA P-499 SCHL. (1999). Basement walls that dry quickly. Research Highlights. Technical series 99-109
4. Test Report No 124017/2023, Radon diffusion coefficient of the polyurethane foam insulation Heatlok Soya HP in accordance with ISO/TS 11665-13.
5. Radon - Reduction Guide for Canadians, Health Canada.
6. Swinton, M.C.; Bomberg, M.T.; Maref, W.; Normandin, N.; Marchand, R.G. In-Situ Performance Evaluation of Exterior Insulation Basement System (EIBS) Spray Polyurethane Foam. Institute for Research in Construction, NRCC, Ottawa, 2000 (A-3132.3)
7. National Building Code of Canada 2010, 2015 and 2020 National Research Council Canada

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