

HEATLOKTM

SPRAY POLYURETHANE FOAM

SOYA



Radon

RADON SOLUTION IN ONE APPLICATION!



The solution
for a **dry,**
comfortable and
durable basement!



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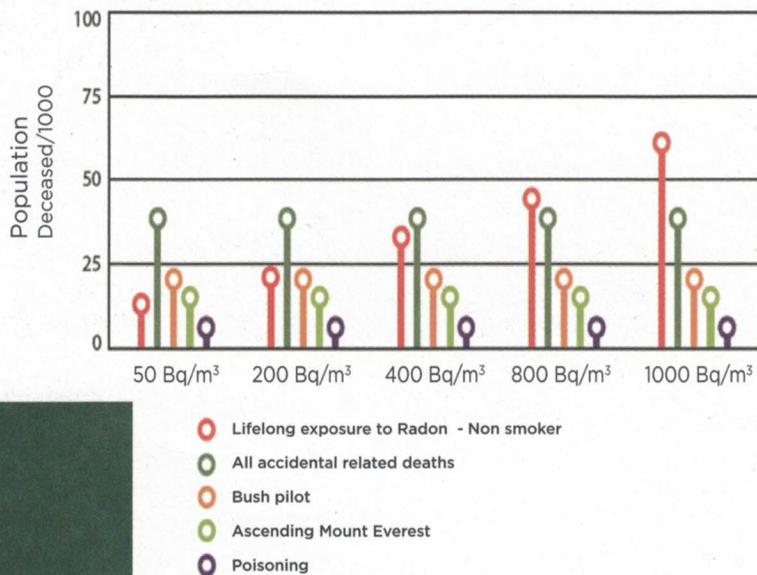
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What is Radon?

Radon is a noxious radioactive gas. It is colourless, odourless and tasteless. It is the second leading cause of lung cancer. It is heavier than air and accumulates in basements. This is a guide to building or renovating a radon gas-proof basement using Heatlok Soya polyurethane spray foam.

Radon can infiltrate in several places: cracks in the floor slab or foundation walls, the joint between the floor slab and foundation wall, openings in the floor slab or sumps. The Canadian Lung Association (CLA), National Building Code of Canada (NBC) **recommend testing for radon if you spend more than four hours a day in a basement.**

Risk from Exposure to Radon⁵



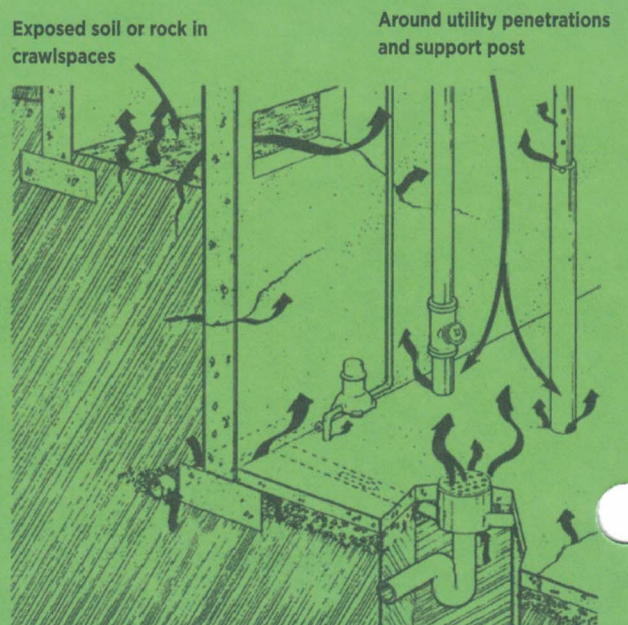
Bq= Becquerel, unit of measurement for Radon gas

Source: Radon - Reduction Guide for Canadians, Health Canada.

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

Potential Radon Infiltration



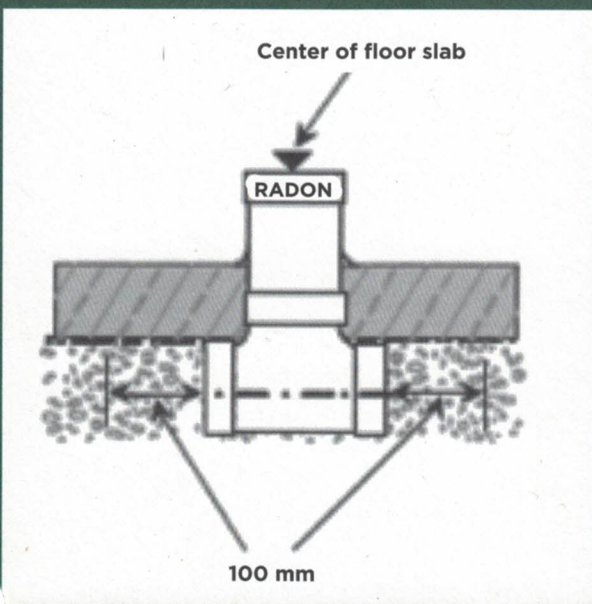
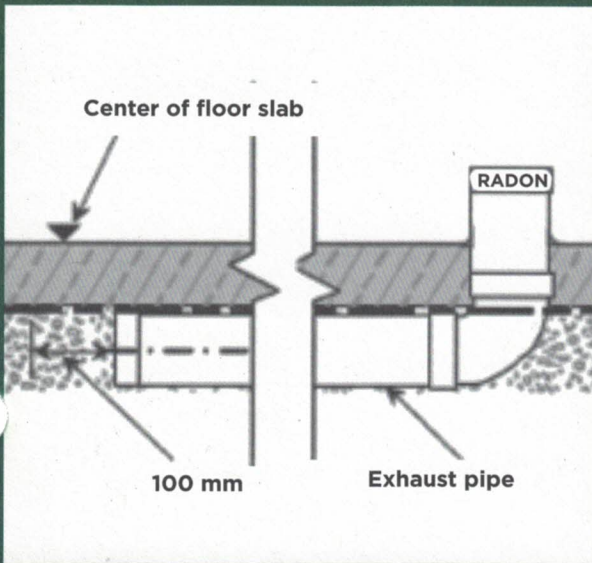
Source: Radon - Reduction Guide for Canadians, Health Canada.

How to build a radon-free basement

There are six steps to build a radon-proof basement in a new building:

1 - Install a depressurization pipe in the gravel under the slab

Installation of this pipe is mandatory under the 2010 National Building Code of Canada. A perforated pipe 4" in diameter must be installed in $\frac{3}{4}$ " gravel net and run to the centre 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 200 Bq/m³.



Source : CNBC 2010

2 - Install an air barrier and radon-tight product on the gravel under the foundation slab

Heatlok Soya is a NBCC compliant air barrier product, in accordance with standard CAN/ULC S 741, and provides perfect airtightness under the foundation slab, as well as being insulating. Heatlok Soya is radon gas resistant, as demonstrated by ISO/DIS 11665-10 tests⁴, and is four times more efficient than a 6-mil polyethylene membrane. The minimum thickness to apply is 32 mm (1 1/4") to meet insulation, air tightness and vapour barrier requirements.

3 - Seal the joint between the foundation wall and the floor slab

The perfect continuity of Heatlok Soya seals the foundation wall joint to the foundation, leaving no seams in the basement insulation anywhere: wall, slab, rim joist. The product is sprayed on in-situ and molds perfectly to the building structure. The continuity between the airtight slab and the wall is perfect. The installation of Heatlok Soya requires no sealant, tape, or cutting of materials, so there are no compatibility issues between materials.

4 - Seal all openings in the floor slab, foundation walls and load-bearing walls, as well as posts and stairs

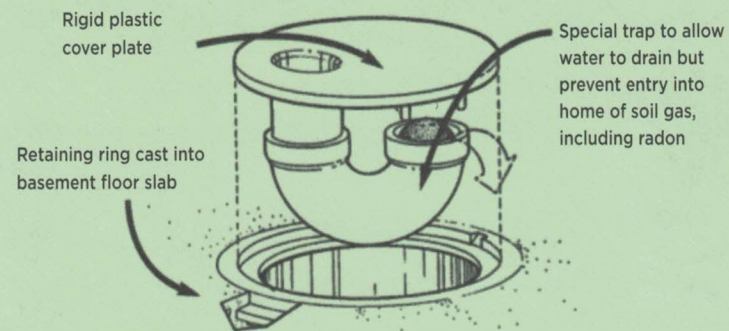
Heatlok Soya seals openings and posts, leaving no room for error. The product seals and expands 30 times its initial volume in 5 seconds.

5 - Install floor drains that prevent gas infiltration

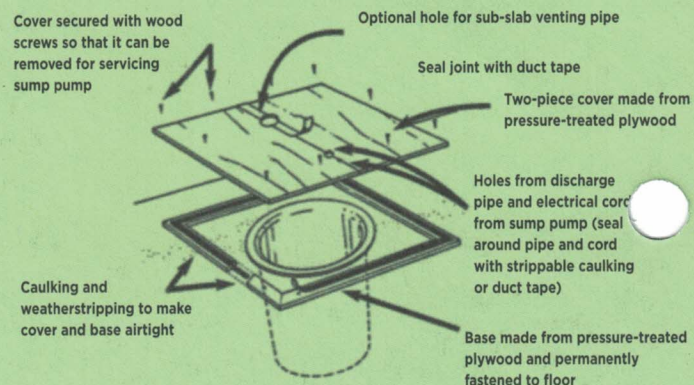
Radon can use water as a vehicle for infiltration. It is therefore important to install floor drains that are specifically designed to prevent gas infiltration.

6 - Install a sealed lid on sumps

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



Source: Health Canada - Radon - Reduction Guide for Canadians



Source: Health Canada - Radon Reduction Guide for Canadians

RADON SOLUTION

Requirements for Insulation and Protection Against Soil Gases

The basement can often be a risky area: high humidity, floods, mold, etc. With the new energy requirements of The National Building Code of Canada (NBCC), it is recommended to insulate under the basement concrete slab. The insulation must have a minimum value of R-5 full surface or R-7.5 for 4 feet (1.2 metre) around the perimeter. In addition, NBCC requires the installation of protection against soil gases (sub-section 9.13.4 of the NBCC), mainly radon. HEATLOK SOYA 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.

With an R value of R-6/inch, HEATLOK SOYA, applied 1 ¼" (32 mm) thick, provides R-7.5 insulation under the entire surface of the slab, exceeding Building Code requirements. The product is sprayed directly on the crushed stone and provides continuous insulation, with no joints. HEATLOK SOYA has very good compressive strength (28 psi).

Reference article for radon NBCC-2010
5.4.1.1.1)e)-A 5.4.1.1 - 9.13.4 - 9.25.3 - 9.36.2.9

During construction, workers can move with wheelbarrows and equipment without damaging Heatlok Soya; 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.

The Canadian government has changed the safe threshold for Radon gas in buildings. The new requirements of the National Building Code of Canada, 2010 (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 acts as an air and vapor barrier. 25 mm (1") of product exceeds the air barrier material requirements by 500 times, creating an air barrier system. The product is tested in accordance with Standard CAN/ULC S741 "Standard for Air Barrier Materials - Specification" and Standard CAN/ULC S742 "Standard for Air Barrier Assemblies - Specification". 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-10	R-12	R-12

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 Details Wood Framing Construction

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Benefits of Using Heatlok Soya



HEATLOK SOYA, used under the slab, on the foundation walls and on the rim joists, provides a continuous, seamless, air-tight, from the insulation below the basement slab right up to the ground floor.

Thermal break

The NBC now requires a thermal break between the foundation wall and the slab (minimum value of R-4). The continuity of the polyurethane foam between the slab and the wall surface creates the thermal break by itself.

Insulation performance

With 1 ¼" (32 mm) below the slab (R-7.5) and 2 ½" (64 mm) on the foundation walls, the required minimum values of R-5 below the slab and R-17 are exceeded: R-17.5 for the full wall assembly assembly without any thermal bridge.

Price-quality ratio

Another benefit of insulating the basement in a single step, namely application below the slab, on the foundation wall and on the rim joists, is the cost savings. Application is very quick and the product cost will be lower per square foot, since the applicator's travel time and prep are offset by the volume to install, compared with a conventional insulation system that involves multiple steps, several materials, plus more labour, which leaves more room for error. When a similar installation is done with the use of insulation panel + polyethylene + sealant + glue and tape the overall performance and the quality of the job depends of the level of workmanship. In a single step with HEATLOK SOYA, we create a durable and perfectly sealed structural envelope during and after the work. All plumbing pipes and vents, sumps and drains in the slab and walls are sealed in one operation, without any complication regarding compatibility of materials. Adhesion to the concrete wall is perfect; there is no possible air space for condensation and mold to penetrate. HEATLOK SOYA delivers an insulation and moisture control system, and a vapor barrier, all in one step, quickly and effectively. The durability, adhesion and quality of the product are confirmed by a CMHC study¹; with everything remaining intact in the long term.

Resistance to radon gas

In addition, HEATLOK SOYA has been tested for its resistance to radon gas by recognized independent laboratories. Tests consisted in comparing HEATLOK SOYA's performance with a 6-mil polyethylene sheet (CAN-CGSB 51.34-M). The results demonstrate that HEATLOK SOYA is 4 times more resistant to radon migration than 6-mil polyethylene.

Consult our video on our website demilec.ca



FOUNDATION

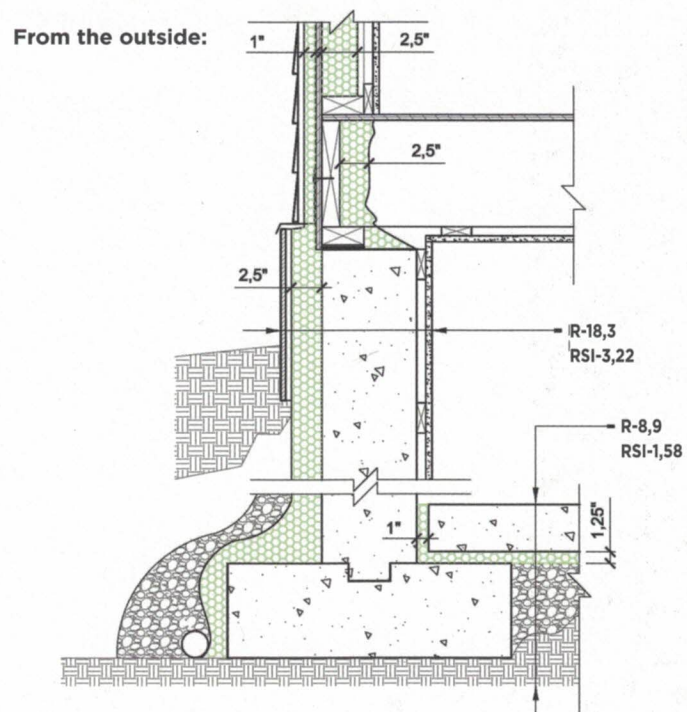
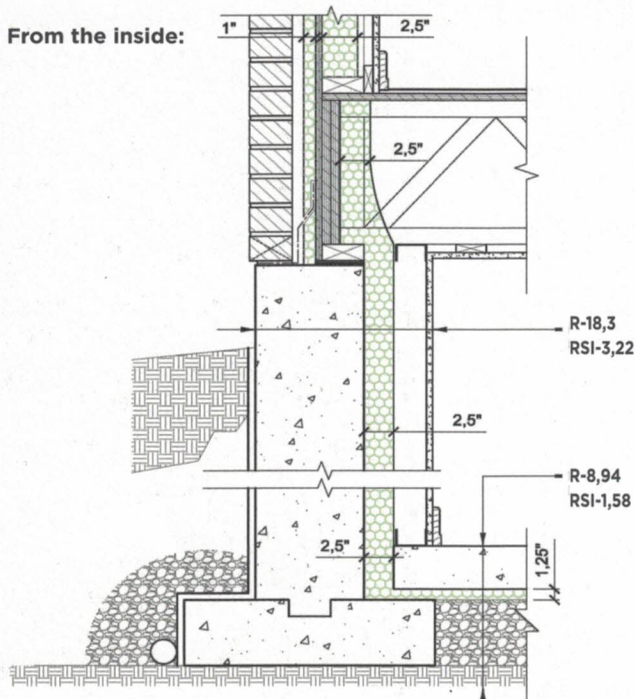


SLAB

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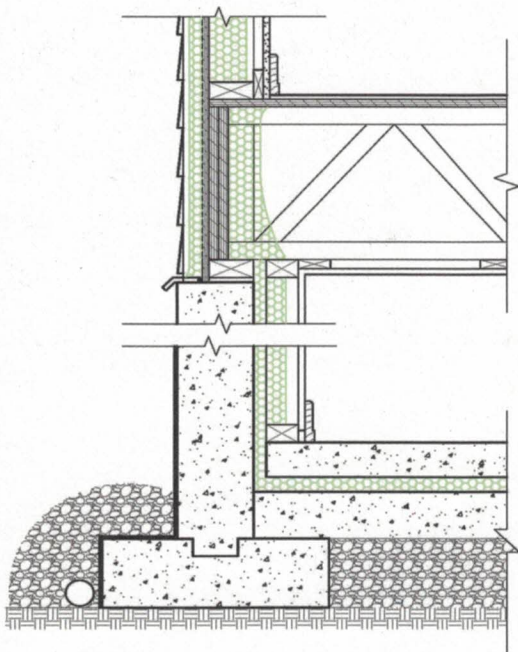
New Construction

Preventing radon gas infiltration in a new construction is even simpler.

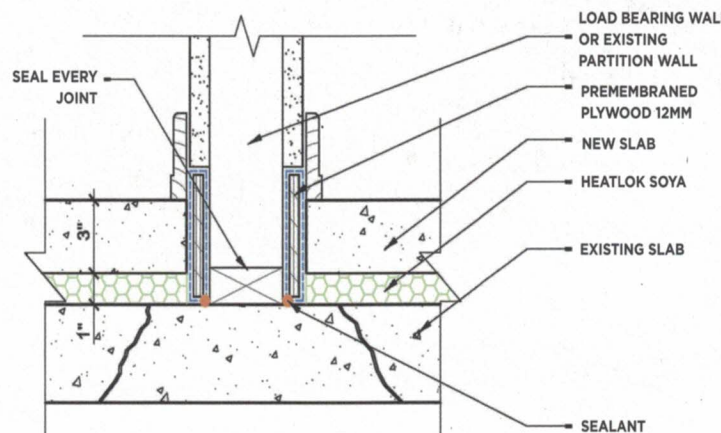


Renovation

A simple solution to prevent radon infiltration in existing buildings. Spray Heatlok Soya 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.



Detail for sealing a bearing wall or an existing divider.



RADON SOLUTION

The Solution for a Dry Basement and Lasting Comfort



The basement is a high-humidity area, prone to mold and mildew development. According to independent laboratory testing (ASTM C1338), mold will not grow in Heatlok Soya foam, 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 zones. The spray polyurethane foam may remain in place even after a flood. The foam does not degrade and, once dry, Heatlok Soya recovers all of its physical properties.

In short, the installation of Heatlok Soya under the slab and on foundation walls saves time and materials, while providing lasting superior-quality insulation and airtightness at a competitive price.

Introduced on the market in 2006, HEATLOK® SOYA is produced in Canada and is a 7.5% postconsumer recycled product. To date, DEMILEC has recycled more than 360 million 591-mL plastic bottles. Heatlok® Soya is suitable for application on all building types. Its installation generates no waste, no jobsite trash. There is no packaging. The product is sold in liquid form in returnable or recyclable containers.



References

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2. Bodycote Materials Testing. (December 2005). Fungal Resistance Testing of Airmetic. Report 05-00342
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 124015/2015, Radon diffusion coefficient of the polyurethane foam insulation HEATLOK SOYA in accordance with the method ISO/DIS 11665-10
5. Radon - Reduction Guide for Canadians, Health Canada.

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)

National Building Code of Canada 2010, National Research Council Canada



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