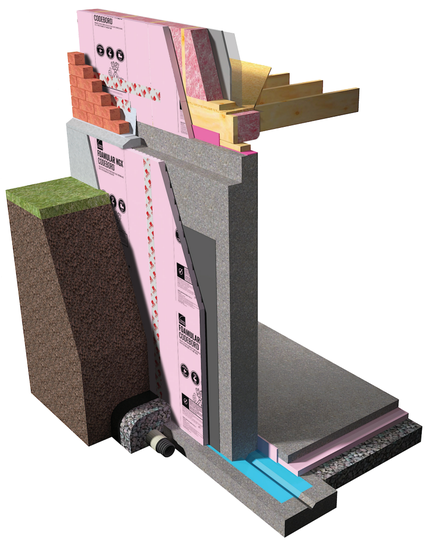
RADONBARRIER™ INSTALLATION GUIDELINES

Exterior XPS Insulation on vertical foundation wall

- Install minimum 100 mm coarse clean granulated material and a 100 mm diametre pipe over undisturbed soil per Code requirements
- Install FOAMULAR® NGX® CodeBord®^ XPS boards horizontally over granulated material
- Seal all foam board joints in the field using Owens Corning® JointSealR® Foam Joint Tape
- Seal the perimetre joint between the horizontal foam boards under the slab and the concrete foundation wall using Owens Corning® ProPink ComfortSeal™ Gun Foam Sealant or with a Code compliant flexible sealant (ASTM C834). Ensure joint between foam and concrete is continuously sealed along the entire perimetre.
- Seal around all penetrations through the foam board insulation under the slab using Owens Corning® JointSealR® Foam Joint Tape or ProPink ComfortSeal™ Gun Foam Sealant or a Code compliant flexible sealant
- Pour concrete slab over sealed insulation system



^FOAMULAR® NGX® C-200 also suitable

To learn more about the Owens Corning® FOAMULAR® NGX® RadonBARRIER™ Radon Abatement System:

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SCARBOROUGH, ONTARIO M1V 1Z5
1-800-GET-PINK®
radonbarrier.ca

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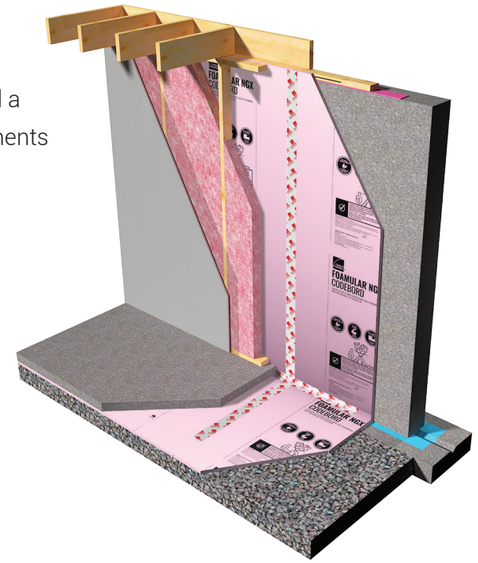
INSTALLATION GUIDE

FOAMULAR® NGX®
RADONBARRIER™
RADON ABATEMENT SYSTEM

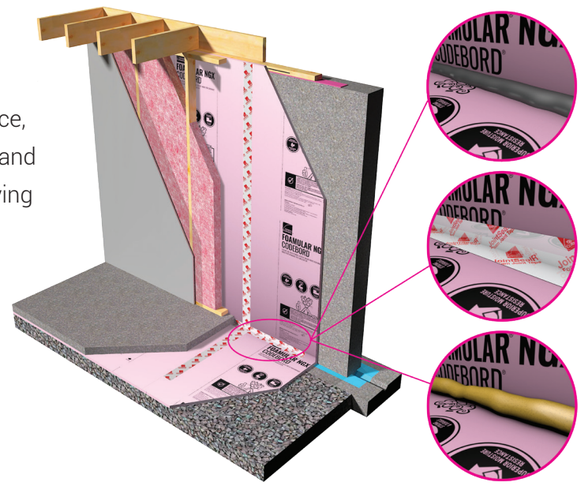
Interior XPS Insulation on vertical foundation wall

- Install FOAMULAR® NGX® CodeBord®^ XPS boards on interior side of foundation wall. Tape all vertical joints using Owens Corning® JointSealR® Foam Joint Tape and seal the foam board to top of foundation wall with a bead of Code compliant flexible sealant along the entire perimetre of the foundation wall.
- Install minimum 100 mm coarse clean granulated material and a 100 mm diametre pipe over undisturbed soil per Code requirements
- Install FOAMULAR® NGX® CodeBord® XPS boards horizontally over granulated material
- Seal all foam board joints in the field using Owens Corning® JointSealR® Foam Joint Tape
- Seal the perimetre joint between the horizontal foam boards under the slab and the vertical foam boards on the wall using Owens Corning® JointSealR® Foam Joint Tape or Owens Corning® ProPink ComfortSeal™ Gun Foam Sealant or a Code compliant flexible
  sealant (ASTM C834). Ensure joint between foam and concrete is continuously sealed along the entire perimetre.
- Seal around all penetrations through the foam board insulation under the slab using Owens Corning® JointSealR® Foam Joint Tape or ProPink ComfortSeal™ Gun Foam Sealant or a Code compliant flexible sealant
- Pour concrete slab over sealed insulation system

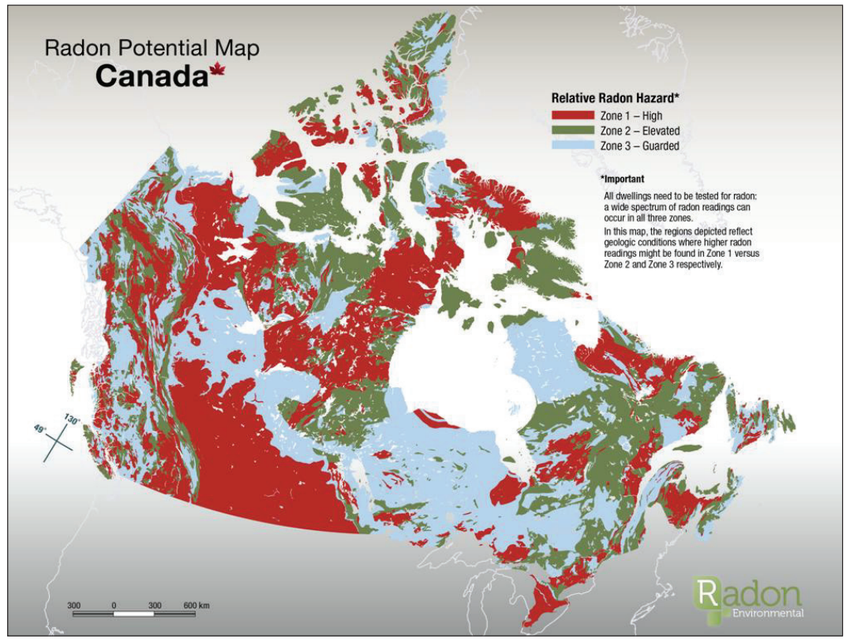


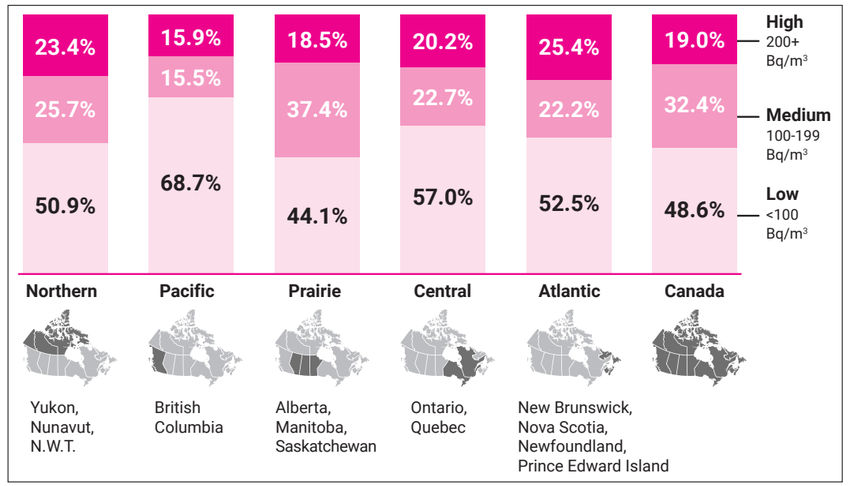
General

- Ensure the XPS surface is clean and dry and free of ice, snow, frost, dust, dirt, oil, grease, cracks, projections and depressions, loose particles and debris prior to applying tape, sealant or canned foam.
- Ensure board joints/penetrations are flush and tight with no gaps before applying tape
- Install floor drains that prevent ingress of soil gases
- Ensure sump pumps are properly sealed to prevent ingress of soil gases
- Add Owens Corning® PINK NEXT GEN® FIBERGLAS® insulation to the interior of the foundation wall to optimize thermal performance



Radon is found throughout Canada, but concentrations differ depending on the composition of the bedrock or sediment





Soil gas control code requirements in Canada

Consult applicable Building Code for soil gas control requirements.

Source: Whitehead, Alan (2014). *Mapping the Geologic Radon Potential of Canada.*
Retrieved from https://radiationsafety.ca/wp-content/uploads/2014/05/Alan-Whitehead-presentationRadonRSIRyerson2014.pdf

FOAMULAR® NGX® RADONBARRIER™ RADON ABATEMENT SYSTEM

Performance Criteria

COMPLIANCE:	CCMC Evaluation Report No. 14349-R	CCMC

SYSTEM COMPONENTS

FOAMULAR® NGX® CodeBord®^ Extruded Polystyrene Rigid Insulation Board

Performance Criteria

COMPLIANCE:	CCMC Evaluation Listing No. 13431-L Type 3	CCMC CAN ULC S701.1-17

Dampproofing Performance

PROPERTY	UNIT	TEST PROCEDURE	REQUIREMENT	RESULT
COEFFICIENT OF WATER ABSORPTION @ 72•h[3]	kg/(m²•s$^{(1/2)}$)	ISO 15148:2002	< 0.0040	0.000004[2] 0.000001[3]
WATER VAPOUR PERMEANCE:	ng/(Pa•s•m²)	ASTM E 96/E 96M-15, Procedure B (wet cup method)	≤ 43	39.4[2] 29.3[3]

Additional Performance Information

PHYSICAL PROPERTIES:	Compressive Strength[4]: **20 psi (140 kPa)** Compressive Modulus (typical): **1000 psi (6895 kPa)** Flexural Strength[5] (typical): **60 psi (414 kPa)** Dimensional Stability, Maximum, % linear change: **1.5** Linear Coefficient of Thermal Expansion: **3.5 x 10^{-5} in./in./°F (6.3 x 10^{-5} mm/mm/°C)**	ASTM D1621 ASTM D1621 ASTM C203 ASTM D2126 ASTM E228
THERMAL[6]:	Thermal Resistance, R-Value, hr•ft²•°F/Btu (RSI, °C•m²/W) 5.0 (0.88) @ 24 °C (75 °F) mean temperature 5.4 (0.95) @ 4.4 °C (40 °F) mean temperature 5.6 (0.99) @ -3.9 °C (25 °F) mean temperature	ASTM C518 or C177
LTTR: (CANADA)	**FOAMULAR® NGX®** Min. LTTR RSI (m2 °C/W) RSI: 0.65 @ 19 mm thickness RSI: 0.87 @ 25.4 mm thickness RSI: 1.27 @ 38.1 mm thickness RSI: 1.67 @ 50.8 mm thickness RSI: 2.09 @ 63.5 mm thickness RSI: 2.51 @ 76.2 mm thickness RSI: 2.93 @ 88.9 mm thickness RSI: 3.36 @ 101.6 mm thickness	CAN ULC S770-15
MOISTURE:	FOAMULAR® NGX® Water absorption, (max % by volume): **0.40** Water Vapour Permeance (typical) FOAMULAR® NGX™: **0.65 Perms (37 ng/Pa.s.m²)** Water Capillarity: **None** Water Affinity: **Hydrophobic** Limiting Oxygen Index, min.: **24**	ASTM D2842 ASTM E96 - - ASTM D2863
FIRE:	Combustible Flame spread 190: smoke developed > 500	CAN/ULC-S114 CAN/ULC-S102.2
MAX. SERVICE TEMP.:	Max. Service Temp. 74 °C (165 °F)	-

Sizes

Thickness	Widths	Lengths	Edges
FOAMULAR® NGX® C-200 XPS*			
25 mm, 38 mm, 51 mm (1", 1.5", 2")	610 mm (24")	2438 mm (96")	Square or Ship Lapped
FOAMULAR® NGX® CodeBord® XPS			
25 mm, 38 mm, 51 mm (1", 1.5", 2")	610 mm & 1220 mm (24" & 48")	2438 mm, 2743 mm, 3048 mm (96", 108", 120")	Square or Ship Lapped

FOAMULAR® NGX® C-200 is shipped in units containing four individually shrink-wrapped packages and FOAMULAR® NGX® CodeBord® is shipped in units containing three individually shrink-wrapped packages.
*Metric sizes for CMU also available

1. Minimum 72 hours as per ISO 15148:2002, "Hygrothermal performance of building materials and products – Determination of water absorption coefficient by partial immersion." The CCMC Technical Guide criterion has been met, which demonstrates that the Owens Corning's XPS board surface provides good water resistance.
2. For 25.4-mm-thick tested specimens.
3. For 38.1-mm-thick tested specimens.
4. Values at yield or 10% deflection, whichever occurs first.
5. Value at yield or 5%, whichever occurs first.
6. The R-value for FOAMULAR® NGX® XPS Insulation is provided from testing at mean temperatures of: -3.9 °C (25 °F), 4.4 °C (40 °F), and 24 °C (75 °F) and aging techniques of 180-day real time aged (as mandated by ASTM C578).

^FOAMULAR® NGX® C-200 also suitable

JointSealR® Foam Joint Tape

Performance Criteria

COMPLIANCE:	CCMC Evaluation Listing No. 14003-R	CCMC

Additional Performance Information

SERVICE TEMPERATURE:	-40 to 74 °C (-40 to 165 °F)	-
APPLICATION TEMPERATURE:	-18 to 49 °C (0 to 120 °F)	-
FIRE:	Flame Spread 5; Smoke Developed 25 Smoulder Resistance Mean Mass Loss ≤ 0.02%	ASTM E84 CAN/ULC-S129
MOISTURE:	Water Vapour Transmission: 0.19 perms (11 ng/Pa•s•m2)	ASTM E96/E96 M (water method)
AIR PERMEANCE (TESTED AT 75 PA)	0.00017 L/s•m2 (0.0000335 cfm/sq. ft.)	ASTM E2178
UV EXPOSURE	Up to 180 days	-

Product & Packaging Data | JointSealR® Foam Board Joint Tape

Property	Value
Thickness (mils)	.25 mm (9.9)
Width	89 mm (3.5")
Length	27.4 m (90')
Roll Dimensions	89 mm x 27.4 m (3.5" x 90')
Rolls Per Carton	8
Cartons Per Pallet	54
Minimum Order Quantity	1 Carton

ProPink ComfortSeal™ Gun Foam Sealant

Performance Criteria

COMPLIANCE:	CAN ULC S-710.1-11, Class 1	CCMC Evaluation Listing No. 14431-L

Additional Performance Information

FIRE:	ASTM E-84	Flame Spread: 25 Smoke Developed: 50
CORE DENSITY:	-	17.6 kg/m² (1.1 lb./ft.³)
R-VALUE:	ASTM C518	4-5 per 25 mm (1") typically
AIR BARRIER PROPERTIES: @ 300 PA (6.24 PSF) **@ 75 PA (1.57 PSF)**	ASTM E283	<0.05 L/s/m² (0.01 cfm/ft.²) <0.0125 L/s/m² (0.0025 cfm/ft.²)
CLOSED CELL CONTENT:	ASTM D2856	>70%
TACK-FREE TIME : 21° C (70° F), 40% RH	-	Approx. 5 minutes
CURE TIME:	-	12-24 hours
CUTTABLE (25 MM (1") BEAD AT ROOM TEMPERATURE CONDITIONS)	-	<1 hour
PRESSURE BUILD:	Tested according to AAMA (812-04) test method for low pressure window and door sealing foam. All properties obtained using internal methods unless otherwise indicated	2-3 psig
YIELD:	Based on theoretical calculations for comparison purposed and will vary depending upon ambient conditions, actual in-place density and particular application	6.3 mm (1/4") BEAD = 1,342 m (4,403 ft.) 9.5 mm (3/8") BEAD = 596 m (1,957 ft.) 12.7 mm (1/2") BEAD = 336 m (1,101 ft.) 16 mm (5/8") BEAD = 214 m (704 ft.) Volume: 42 litres (1.50 ft.³)
ODP (OZONE DEPLETION POTENTIAL)	-	Contains non-ozone depleting hydrocarbon propellant
VOC CONTENT:	-	Contains less than 20% by weight VOCs (206 g/l)

RADONBARRIER™ - THE OWENS CORNING® FOAMULAR® NGX® HIGH PERFORMANCE BASEMENT ENCLOSURE SYSTEM WITH PROTECTION FROM SOIL GAS (RADON) INGRESS

The complete solution that provides a lower living space that is[1]:

- Comfortable
- Energy efficient
- Drier
- Has better indoor air quality
- Durable
- Safer

Radon: The unfamiliar killer.

Radon is a radioactive gas that is odourless, colourless, 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.

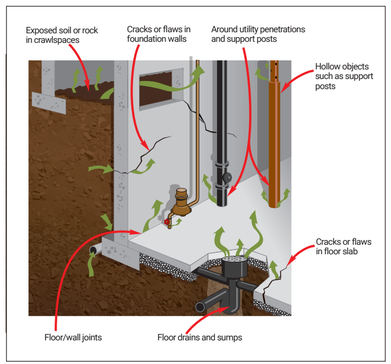
Between 2009 and 2011, Health Canada conducted a survey of radon concentrations in homes across Canada. The study tested radon levels in 14,000 homes over three months. The results indicate that seven per cent of Canadians are living in homes with high radon levels.

Exposure to **radon** increases the **risk** of developing lung cancer. This has prompted concern that **radon levels** in some **Canadian homes** and buildings may be a health **risk**. It is estimated that about 10% of all lung cancers worldwide are related to **radon**.

According to Health Canada, the acceptable level of radon in the average home is 200 becquerels per cubic metre (200 Bq/m³), while the World Health Organization sets the acceptable level at 100 becquerels per cubic metre (100 Bq/m³).

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

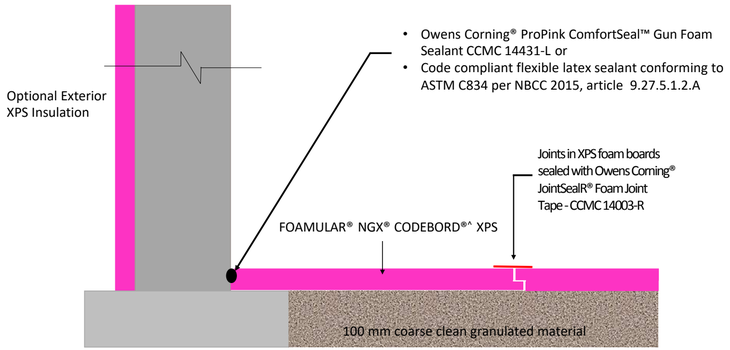
- Unfinished floors (dirt);
- Construction joints;
- Gaps around service pipes;
- Support posts;
- Window casements;
- Floor drains;
- Sumps; and/or
- Cavities inside walls.

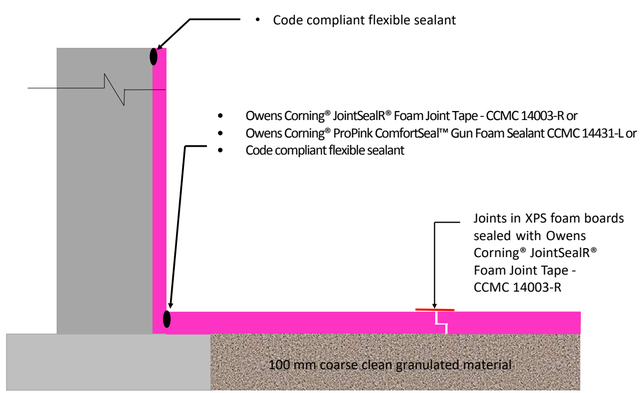


[1]Compared to a space with radon

Source: CREA Canadian Real Estate Association Study

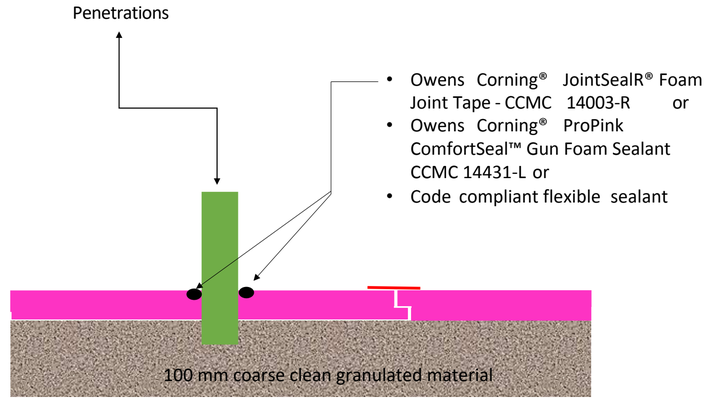
THE RADONBARRIER™ RADON ABATEMENT SYSTEM





^FOAMULAR® NGX® C-200 also suitable

Sealing around penetrations



Install strips of JointSealR® Foam Joint Tape to provide a continuous seal of the gap between the penetration and the rigid insulation. Ensure proper sealing of the penetration by applying a series of vertical strips of tape as shown in images 2 and 3.

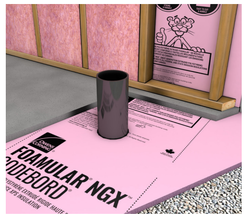


Image 1

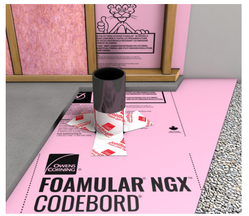


Image 2

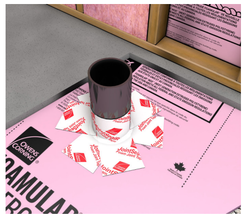


Image 3