



Welcome to today's CHBA Net Zero Webinar!



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**The
CHBA
Net Zero
Team**





Housekeeping

- This webinar is being recorded. CHBA Members can access the Net Zero webinar archive at www.chba.ca/nzwebinars. (Recording + slide deck.)
- You will be in **“listen-only”** mode for the duration of the webinar.
- After the presentation we will have time for questions. **Please use the question section of the dashboard** throughout the webinar and I will relay the questions to the presenter(s).

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- High Performance Building Enclosure Systems

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- Principles of Acoustics and new ASTC Code Requirements
- Eliminating Thermal Bridges and Online Design Tools
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Our Next Webinar

March 24 from 1:00-2:30 ET (10:00-11:30 PT)

Can existing housing get to Net Zero safely & affordably?

Net Zero Renovations: Lessons from the NRCan Pilot Project

Join this webinar to learn about the results and lessons learned from the NRCan funded Net Zero Renovation Pilot initiative - directly from those who shaped it and used it to safely renovate homes to Net Zero or Net Zero Ready.

We'll review the project achievements and hear from the Net Zero Renovators and Energy Advisors on which techniques and technologies they used to renovate the homes. You'll also hear the homeowners' motivations and testimonials as well as learn about the energy cost and GHG savings.

CHBA Project Manager, Marie Hanchet, and Gary Sharp, former Director of the CHBA Canadian Renovator Council, will deliver presentations, then some of the project Renovators and Energy Advisors will join them for a panel conversation, including audience Q&A at the end.

Register at chba.ca/NZwebinars



Today's Webinar



Discover the New Generation of Spray Foam

Presented by Chris Janzen, Field Applications and Warranties Manager, PM North America, BASF Canada & Ibrahim Huseen, Construction and Standards Regulations Specialist, BASF Canada

Building codes, product standards, and regulatory requirements are changing for spray foam. This webinar will examine the latest industry updates and how this impacts your projects. Join us to learn how spray foam's innovative applications can make your upcoming project code compliant, energy efficient and green.

Join the webinar to:

- Gain knowledge on the new generation of spray foam using HFO blowing agents
- Learn about the steps required for your upcoming new build project
- Ensure you're using a certified installer to be code compliant
- Uncover new applications of spray foam including WALLTITE CM01 as a radon barrier

Chris Janzen has been with BASF Canada for over 19 years covering various aspects of technical support, product development, market development, and customer training for the spray polyurethane foam business. His experience has brought him exposure to residential, commercial, and roofing applications in Canada and abroad. He has recently taken on the role as Field Application & Warranty Manager for BASF in North America and is co-chair for the Spray Foam Coalition's Canada Work Group.

Ibrahim Huseen is a Construction and Standards Regulations Specialist at BASF Canada. In his role, he focuses on national and provincial building codes and standards. Ibrahim provides engineering support for the polyurethane spray foam (SPF) business. He manages research and development of projects across North America. He also participates in ULC and ASTM standards developments. Prior to joining BASF, he worked as a building engineer consultant specializing in building science. Ibrahim has a Master of Civil Engineering with an emphasis on Construction Management from Concordia University.





WALLTITE®

Discover the New Generation of Spray Foam



Chris Janzen
BASF Canada



Ibrahim Huseen
BASF Canada

TOPICS COVERED IN THIS WEBINAR

- Spray Foam Basics
- Changes to the Building Code, Regulatory, Sustainability
- Applications for ccSPF
- NEW application – Radon and Soil Gas
- Take Away

Spray Foam in Construction

Ideal for All Types of Construction Projects



Industrial



Commercial



Institutional



Residential



Multi-Residential

Related Spray Foam Applications

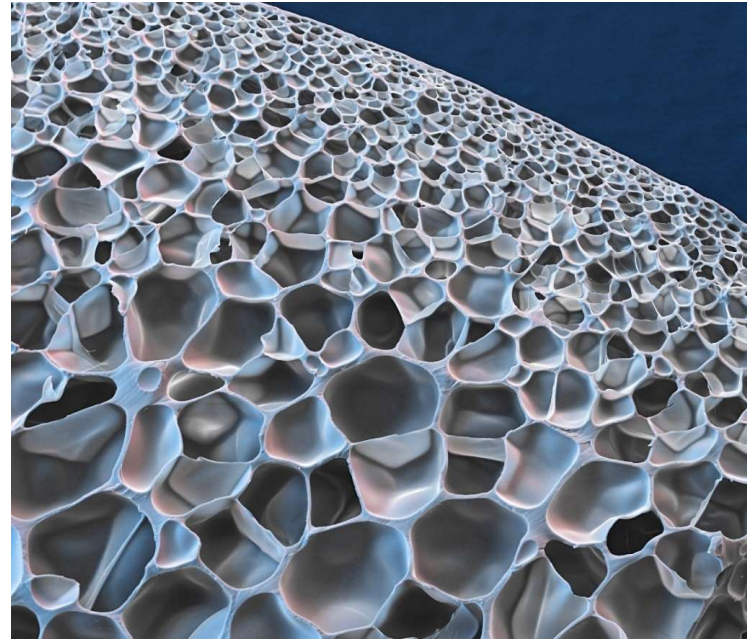
Closed Cell Polyurethane Foam - ccSPF



Multifunction

Provides all 4 Control Layers

1. Thermal
2. Air
3. Water
4. Vapour



Closed Cells are formed

Gas (blowing agent) retained

Thermal Control

R Value (LTTR*)



*Calculated using the version of the LTTR required by the NBC and OBC

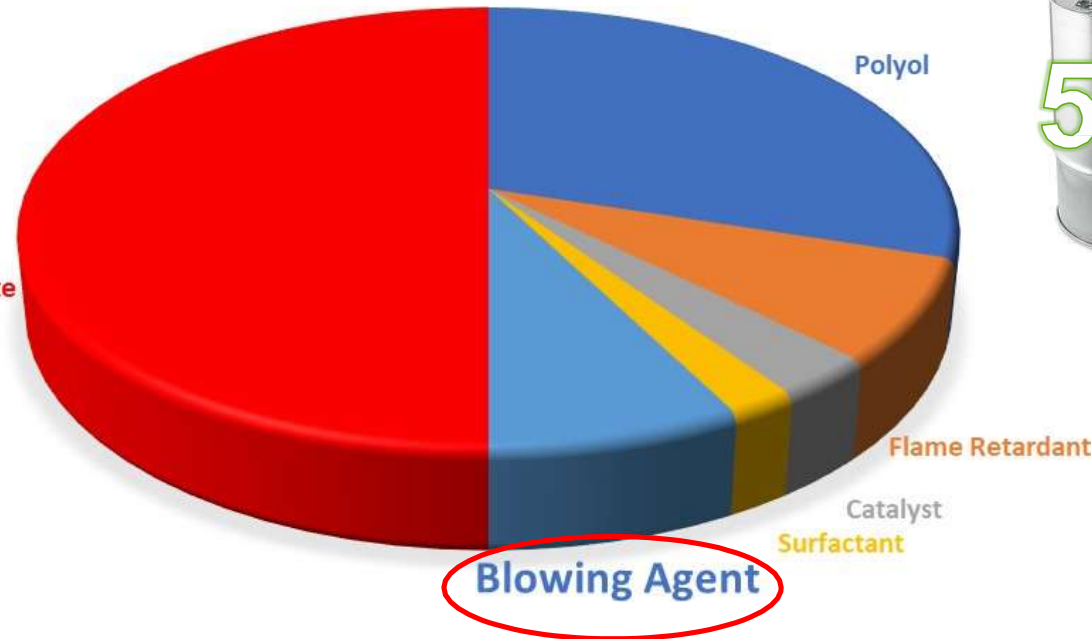
Closed-Cell Spray Foam Composition = 1 set/kit

Isocyanate

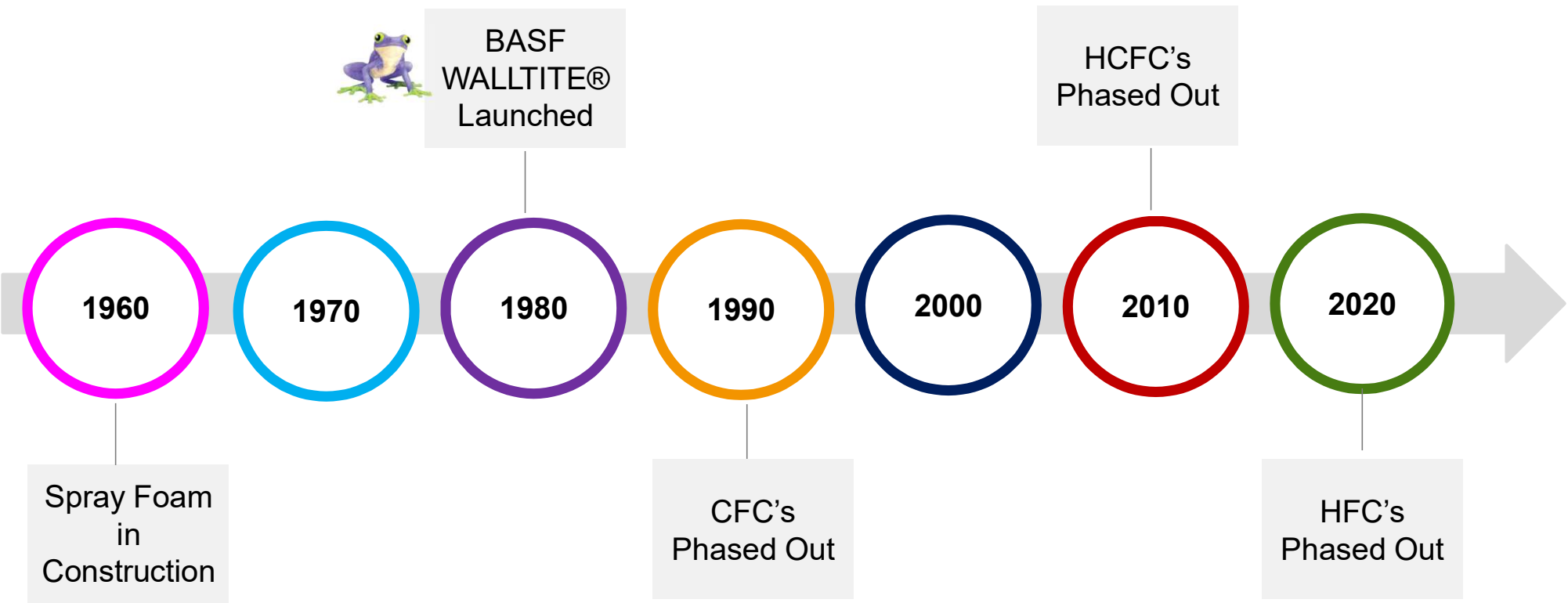


Isocyanate

Resin



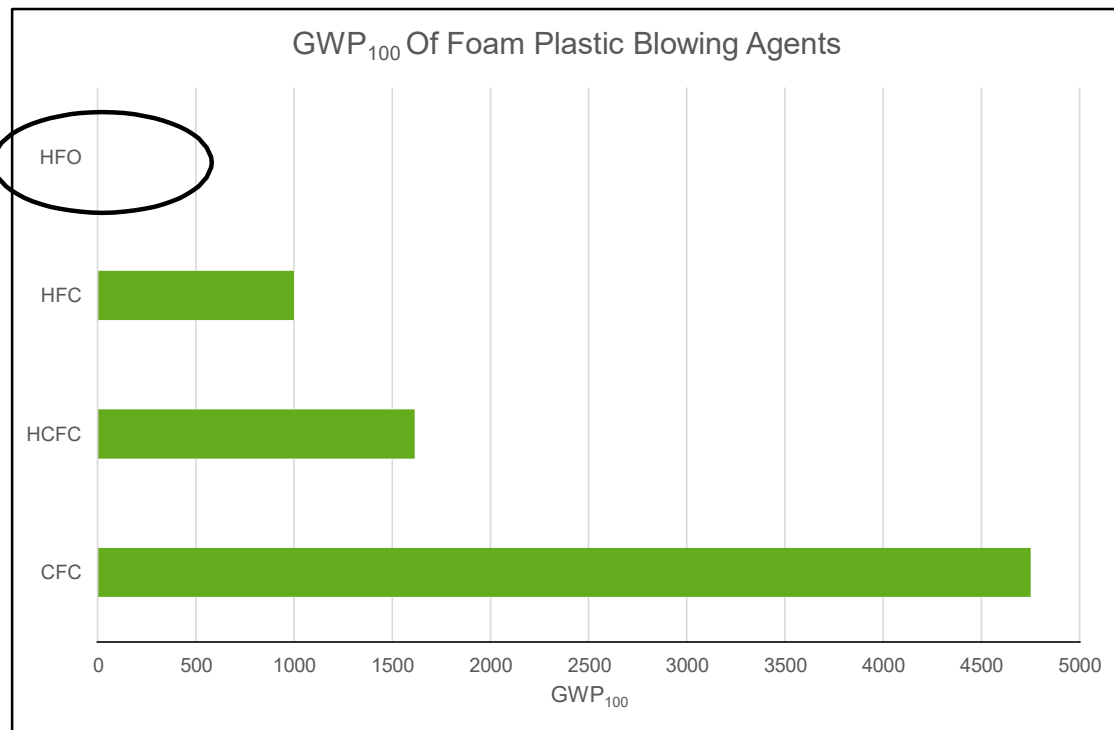
Spray Foam Evolution



Blowing Agent Evolution

Kigali Amendment to Montreal Protocol

- Implemented January 1, 2019
- Focused on Global Warming Potential (GWP) of HFC's in refrigeration and foam plastics
- Can help avoid 0.4C of global warming* (UN Environment Program)
- HFO has GWP of <1



Blowing Agent Evolution

- January 1, 2021: HFC blowing agent foam plastic production stopped
- Replaced by HFO blowing agent
- 2017 WALLTITE® CM01 HFO foam commercially available

JANUARY 2021						
Sun	Mon	Tue	Wed	Thu	Fri	Sat
27	28	29	30	31	1	2
3	4	5	6	7	8	9
10	11	12	13	14	15	16
17	18	19	20	21	22	23
24	25	26	27	28	29	30
31						

HFC vs. HFO Closed-Cell Spray Foam

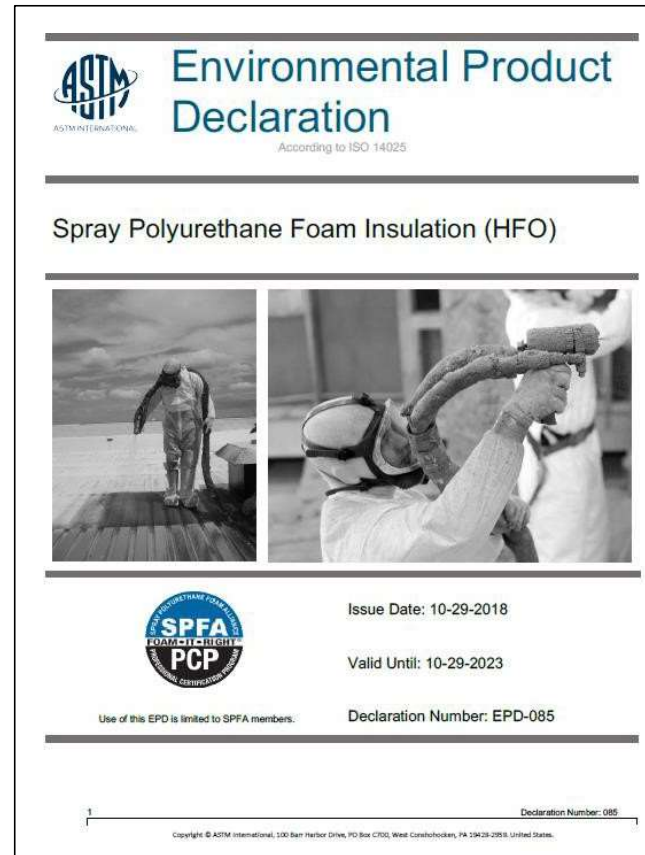
Criteria	Previous ccSPF	WALLTITE® CM01
Blowing Agent	HFC	HFO
Density (lb/ft³)	1.8-2.5	1.85
Insulation (R per inch)	5.8-6.1	5.2-5.5
GWP (kg CO2 eq) Blowing Agent Only	1030	<1
GWP (kg CO2 eq) Finished Product 1m2@1RSI	20	4
Air Barrier Material	✓	✓
Vapour Barrier	✓	✓
Low Water Absorption	✓	✓
Interior Insulation	✓	✓
Continuous Insulation (Exterior)	✓	✓
Structural Strength	✓	✓



Measuring and Comparing Environmental Impact

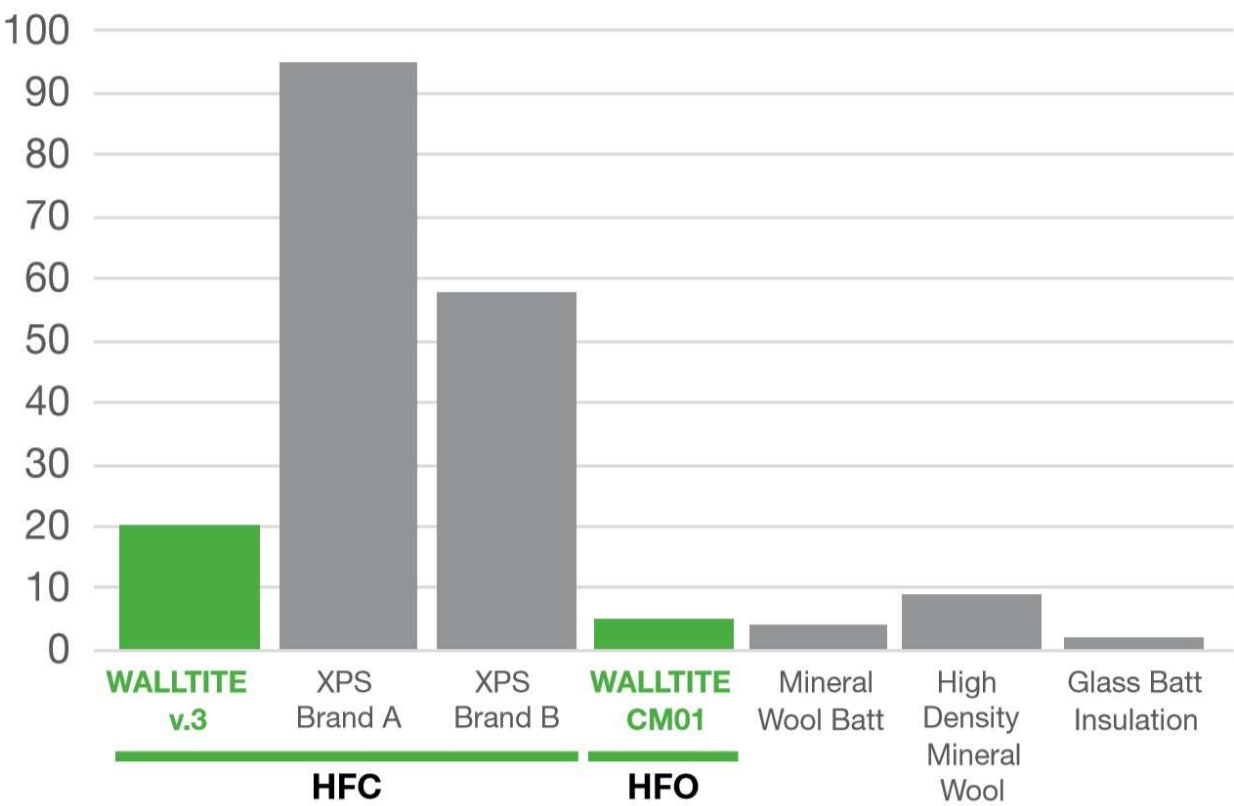
EPD Environmental Product Declaration

- Life Cycle Assessment (LCA)
- Functional Unit of 1m² @1Rsi
- Common, comparable information
- Measuring GWP, Carbon footprint...
- Independently verified
- Standard: ISO 14025



EPD's for Insulation

GWP [KG CO2] OF DIFFERENT INSULATIONS



Note 1: GWP evaluated cradle to grave
Note 2: Values are based on data sourced from publicly available environmental product declarations (EPDs).

LEED v.4

- MRc2 - Environmental Product Declaration – OPTION 1
 - EPD-085
- MRc4 - Material Ingredients – OPTION 1
 - HPD Builder
- REGIONAL MATERIALS
 - Site Manufactured
- LOW-EMITTING MATERIALS
 - Product is compliant with CDPH Standard Method v1.1-2010



ASTM INTERNATIONAL

Environmental Product Declaration

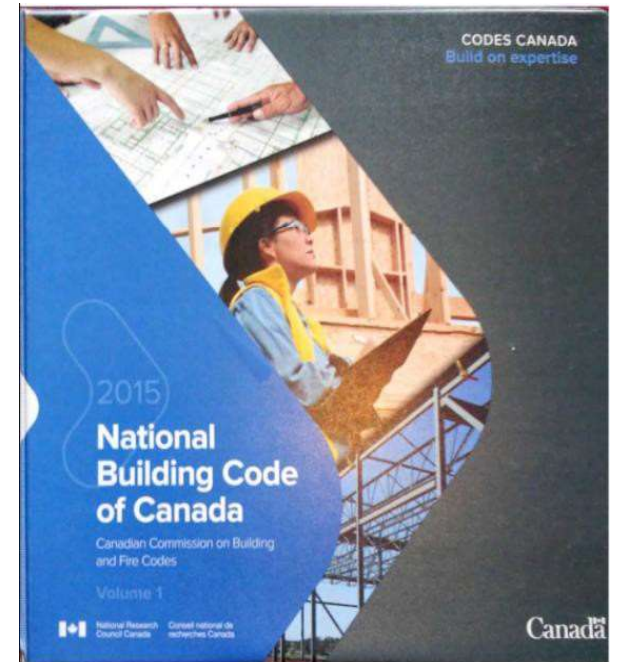
According to ISO 14025



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UPDATES TO STANDARDS AND BUILDING CODES

- 2015 National Building Code
 - Replaces 2010
 - Includes more recent Standards
 - CAN/ULC-S705.1-01 is now CAN/ULC S705.1-15
 - Provincial Codes Updated by Regulation



UPDATES TO STANDARDS AND BUILDING CODES

What changed?

Property	2010 National Building Code	2015 National Building Code
Product Standard	CAN/ULC S705.1- 01	CAN/ULC S705.1- 15
LTTR Test Method in Standard	CAN/ULC S770- 03	CAN/ULC S770- 09 More complex
Initial Thermal Resistance	Included	Removed
Dimensional Stability	No limit on shrinkage	2% limit on shrinkage
Fungi Resistance	Not included	Included

Design with Spray Foam

Steps

- Include on drawings used for building permit
- Hire a reputable spray foam contractor
- Certified Installers
- Area to be sprayed is accessible and other trades are not doing work in the spray area
- Get paperwork from spray foam contractor for building inspectors

Choosing an SPF Contractor and Installer

Registered Contractor

- Need to be registered and in good standing with Certification Organization to buy product



Certified Installer

- Certified by certification organization to spray foam and ISO 17024
- Trained on spray foam and building science



Choosing an SPF Contractor and Installer

Quality Applications

Certified Installers

- Responsible for safety within the spray area
 - Personal Protective Equipment (PPE)
 - Particles can be asthma inducing during application if proper
- Responsible for Quality Control
 - Daily Work Records
 - Job Site Labels

BASF Job Site Label

This Job Site certificate indicates that the installed spray applied rigid polyurethane foam insulation meets the CANULCS705.1 – medium density – product standard. This product has been installed according to the CANULC-5705.2 installation standard.

Job Site
Address: _____
Product Names: _____ CCMC: _____
Licensed Contractor: _____ ID: _____
Certified Installer: _____ ID: _____
Daily Work Sheet #: _____ Date: _____
Signed: _____ Phone: _____
Address: _____ Fax: _____

Areas Installed:
Above Grade walls ☐ Thickness _____ R Values _____ Rim joist ☐ Thickness _____ R Values _____
Cantilever Floors ☐ Thickness _____ R Values _____ Other ☐ Thickness _____ R Values _____
HP+ Walls ☐ Thickness _____ R Values _____
Below Grade Walls ☐ Thickness _____ R Values _____



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CALIBER
by **GAP**

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PROJECT INFORMATION

Contractor: _____
Product Name: _____
City: _____
State: _____
Zip: _____
Project Description: _____
Total Project Wall Area: _____
Please Contact responsible for thermal barrier: _____

MATERIAL INFORMATION

Product: _____
Lot number: _____
Expiry Date: _____
Manufacturing Date: _____
Shelf Temperature: _____
Quantity of Foam Used: _____
Quantity of Foam Used: _____
Kg _____ Pounds (28.3) _____

EQUIPMENT

Manufacturer of machine: _____
Model: _____
Holding Chamber Size: _____
Pressure: _____
Booster Temperature: _____
Primary _____ Secondary _____
Time (hours): _____ Ambient Temperature (°F): _____ Relative Humidity (%): _____
Substrate Temperature (°F): _____

SUBSTRATE CONDITIONS

Type: _____
Condition: _____
Dry: _____
Properly Sealed: _____
Proper Adhesion: _____

TEST RESULTS

Weight of Sample #1 (g): _____
Weight of Sample #2 (g): _____
Thickness of Sample #1 (in): _____
Thickness of Sample #2 (in): _____
Number of Passes: _____
Adhesion Test #1: _____
Adhesion Test #2: _____
Adhesion Test #3: _____

SIGNATURES

Signature: _____



VERIFYING SPRAY FOAM INSTALLATION FOR BUILDING INSPECTORS

SPF Paperwork Review and Checklist

ARC-CHRC CONSTRUCTION

Evaluation Listing CCMC 14100-L

Walltite® CM01

MasterFormat: 07 21 19 02
Evaluation issued: 2018-07-17

1. Evaluation

The product conforms to CAN/ULC-S705.1-15, "Standard for Thermal Insulation - Spray Applied Rigid Polyurethane Foam, Medium Density - Material Specification." The product meets the minimum site density, long-term thermal resistance (LTTR) and water vapour permeance (WVP) time-to-occupancy values are provided in Table 1.1.

Product	Minimum Site Density ⁽¹⁾ (kg/m³) [lb/ft³]	50 mm LTTR (m²·K/W) (ft²·°F·h/Btu)	50 mm WVP ⁽²⁾ (ng/(Pa·m²·s))	Time-to-Occupancy ⁽³⁾ (day)
Walltite® CM01	29.87 [1.85]	1.82	56	1

Notes to Table 1.1:

- Based on the qualification testing to CAN/ULC-S705.1, the specified minimum site density must comply with CAN/ULC-S705.1, as measured on-site in accordance with CAN/ULC-S705.2, "Standard for Thermal Insulation - Spray Applied Rigid Polyurethane Foam, Medium Density - Application."
- The water vapour permeance (WVP) is determined from a core sample with the skin removed. Due to the effect of the skin, the WVP at this thickness would be lower in the site-installed product.
- For retrofit construction, the time to occupancy is one (1) day when the segregated retrofit area is ventilated as required by CAN/ULC-S705.2 during installation of the product. See Note 3 in Table 1 in the Annex for the product for further details.

2. Description

The product is a spray-applied, rigid polyurethane foam of medium density. The foam system consists of two components: isocyanate and resin. The two components are mixed on-site by a qualified installer with fixed-ratio positive displacement equipment.

The colour of the final cured product is **purple**.

LTTR for 50 mm is RSI 1.82.

3. Standard and Regulatory Information

See the Annex appended to this Listing, which summarizes the product information.

This product was previously evaluated to the product standard referenced in the Annex, current as of 2017-10-27. Note that the Annex may have been updated since this Listing was issued to include more recent editions of the applicable product standard. Therefore, this Listing may not reflect the requirements contained in any updated version of this product standard.

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Installer Certification Verification

Product and CCMC Number Match

Product meets latest standard

Installed density exceeds minimum site density

Colour of installed product matches listing and DWR

R Value correlates to installed thickness and LTTR

website address

THIRD-PARTY VERIFIER

Check Contractor and Installer Status

Installer's Exact Name or Card Number

Status / Mark: **CERTIFIED / CERTIFIÉ**

Program / Programme: Card # / # Carte: **SPF Installer 7689**

Name / Nom: **Johnny Installer**

Valid thru / Valable jusqu'à: **2020-12-31**

Third-party Verifier

INSULATION SYSTEM DAILY WORK RECORD

Contractor: **Professional Trade Corps** Card #: **7689**

Installer: **Johnny Installer**

Project Information:

Customer Name: **TOTAL CORP** Construction: ☒ Unoccupied ☐ Occupied ☐

Project Name: **West N. Addition** Ventilation 6.3 ACH: ☒ Yes ☐ No ☐

Project Address: **100 N. 1st St. N. W.** Spray Area Isolated: ☒ Yes ☐ No ☐

City: **Winnipeg** Warning Sign Posted: ☒ Yes ☐ No ☐

Phone: **204-981-1111** Type: ☒ Residential ☐ Commercial ☐ Other ☐

Project Description: **Addition to home** Building Permit: ☒ Yes ☐ No ☐

Total Project Work Area: **1000** sq. m. ☐ sq. ft. ☒

Person/Company responsible for thermal barrier: **None**

MATERIAL INFORMATION

Product: **WALLTITE CM01**

CCMC # **14100-L**

Formulation: **Regular**

Lot number: **0012312390209083114**

Expiry Date: **YYMMDDYYMMDD**

Manufacturing Date: **YYMMDDYYMMDD**

Quantity of Cycles Used: **1000** Quantity of Foam Used: **4.0** m³ ☐ ft³ ☒

Manufacturer of Machine: **Graco** Model: **H30**

Mixing Chamber Size: **1000** ml ☐ L ☒

Isocyanate psi: **900** Hose Length: **30** m ☐ ft ☒

Primary Master Temperature: **20** °C ☐ °F ☒

Hose Temperature: **100** °C ☐ °F ☒

ENVIRONMENTAL CONDITIONS

Time (Hr:min): **10:00**

Ambient Temperature: **20** °C ☐ °F ☒

Relative Humidity: **50** % ☐ Mph ☐ Km/h ☐

Wind Velocity: **21** m/s ☐ Km/h ☐

Substrate Temperature: **25** °C ☐ °F ☒

SUBSTRATE CONDITIONS

Type: **OSB**

Conditions: ☒ Clean ☐ Greasy ☐ Damp ☐ Dry ☐ Properly Fastened ☐ Proper Adhesion

Special Conditions: ☒ Primer Required ☐ Protector Required ☐ Exterior Coating ☐ Interior Thermal Barrier

Details: **Clean, dry substrate**

Moisture Content (MC): **5** %

TEST RESULTS

Density Calc: **Open cell: g/cm³ = kg/m³ ÷ 1000**

Volume (Closed foam cell) (Gross) (cc) **1000**

Weight of Sample #1 (g): **5.9**

Volume of Sample #1: **2.00** L

Weight of Sample #2 (g): **5.9**

Volume of Sample #2: **2.00** L

Weight of Sample #3 (g): **5.9**

Volume of Sample #3: **2.00** L

Thickness Pass #1: **5.9** mm

Thickness Pass #2: **5.9** mm

Thickness Pass #3: **5.9** mm

Number of Passes: **1** ☐ 2 ☐ 3 ☐ Total Thickness: **1.00** m

Adhesion Test #1: **Pass** ☐ Fail ☐

Adhesion Test #2: **Pass** ☐ Fail ☐

Adhesion Test #3: **Pass** ☐ Fail ☐

Cohesion Test #1: **Pass** ☐ Fail ☐

Cohesion Test #2: **Pass** ☐ Fail ☐

Cohesion Test #3: **Pass** ☐ Fail ☐

CORRECTIVE ACTIONS (List corrective action taken as a result of test failures)

Signature: **[Signature]**

Checklist

Request copy of CCMC Listing, Daily Work Records, and Installer's Certification Card be submitted

FROM CCMC LISTING

- ☐ Verify product conforms to CAN/ULC S705.1-15 or referenced standard in provincial building code
- ☐ Verify minimum site density
- ☐ Verify LTTR value at 50 mm
- ☐ Verify colour of cured product

FROM DAILY WORK RECORD

- ☐ Installer certification number
- ☐ Product installed matches CCMC Listing number and colour
- ☐ Site density exceeds minimum site density listed on CCMC Listing
- ☐ Thickness and installed R value meet local code requirements

FROM INSTALLER'S CERTIFICATION CARD

- ☐ Verify installer is certified for the current year
- ☐ Check up-to-date certification status online through QAP provider identified on certification card

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Applications for Spray Foam

Advantages:

- ✓ Low GWP
- ✓ High R value
- ✓ Air Barrier
- ✓ Vapour barrier
- ✓ Prevents growth of mold and fungi
- ✓ Versatile



Walls Above Grade



After Electrical is completed
High R-value in existing framing
Air seals and strengthens existing walls
Sealant used at double studs, top plates and
bottom plate



Exterior Application



Provides Continuous Insulation (CI) on top of existing wall system

Easily air seals existing wall system with new air barrier

Need to verify existing building envelope can be retrofitted

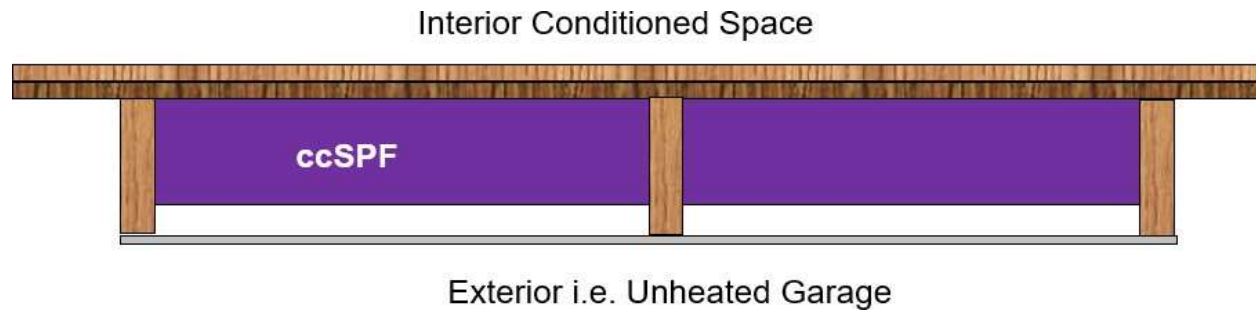
Living Area Over Unconditioned Space

Warm Floors

Air seal, vapour barrier, and insulation

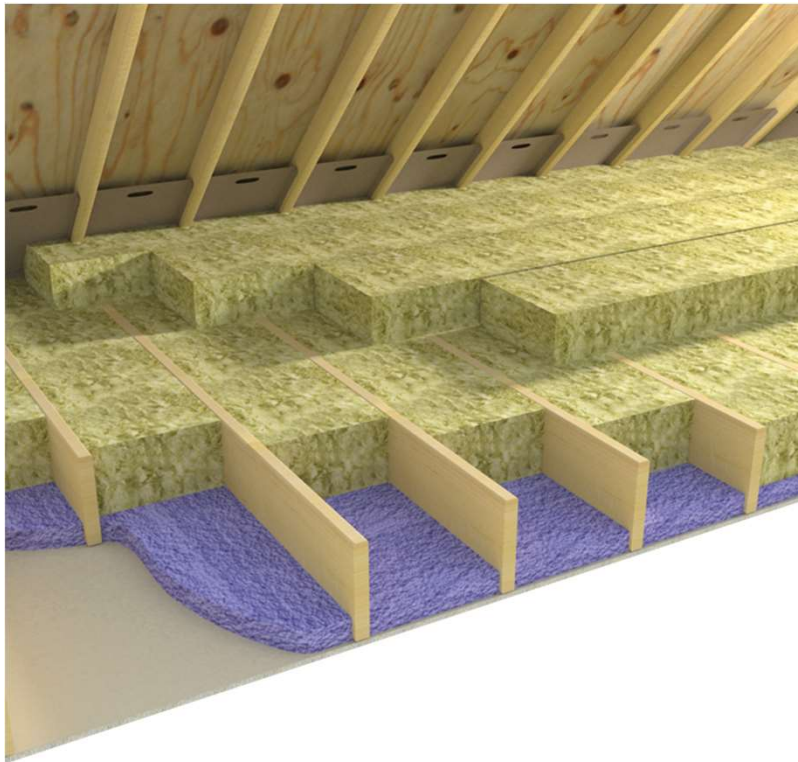


Garage Ceilings, Bay Windows, Porches

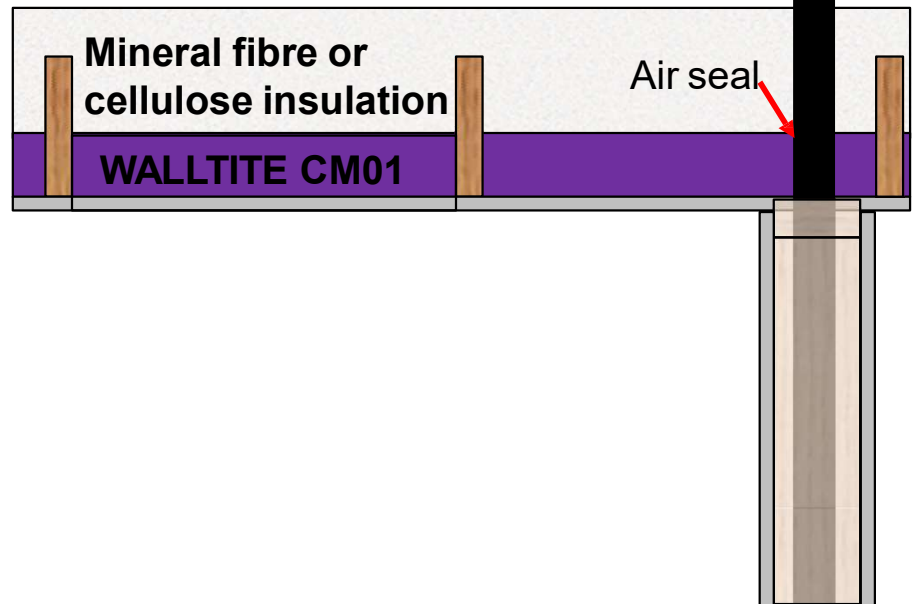


Attic

Air seal, vapour barrier, and insulation

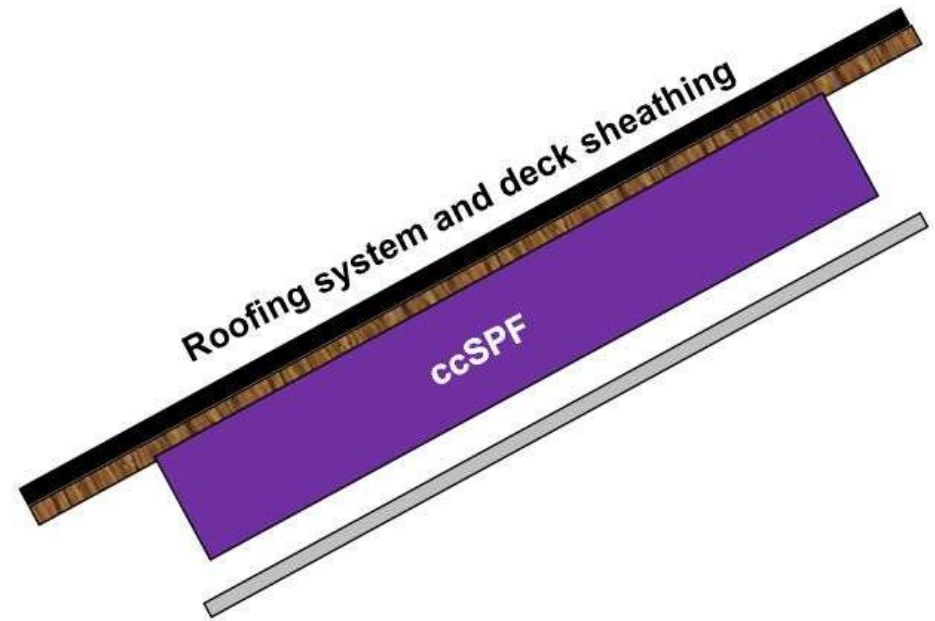


Air seal, vapour barrier, and insulation

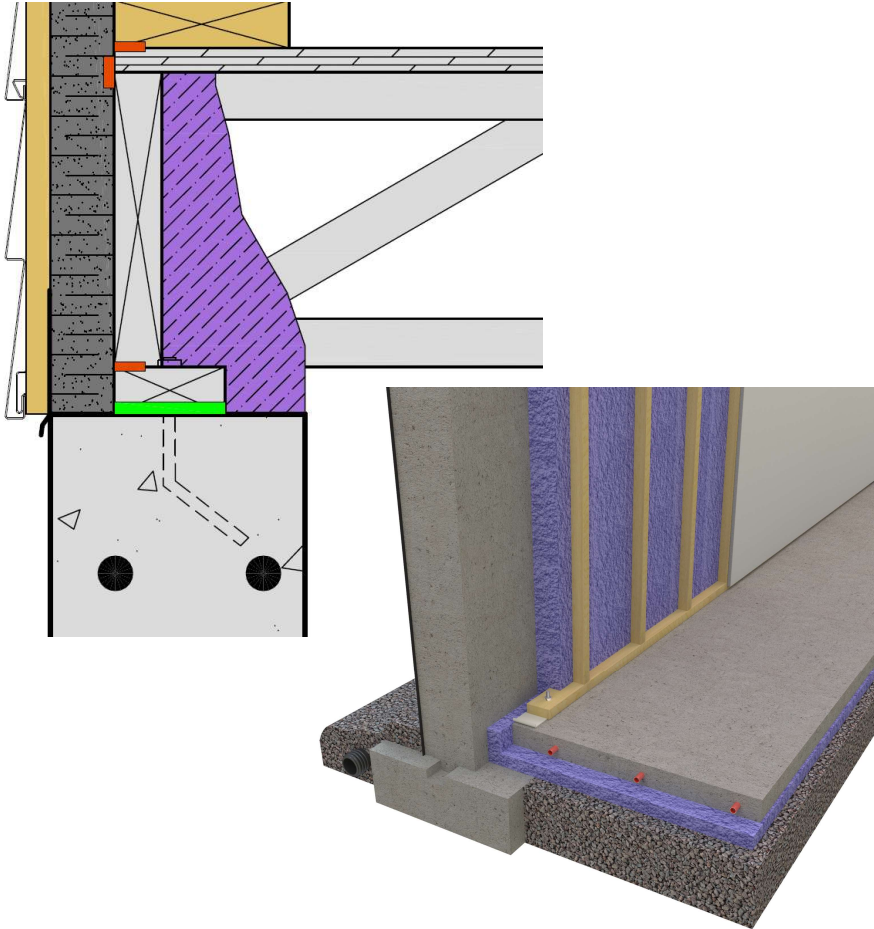


Cathedral Ceilings

Air seal, vapour barrier, and insulation



Basements



Address leaky foundation before SPF application

Off set studs from wall

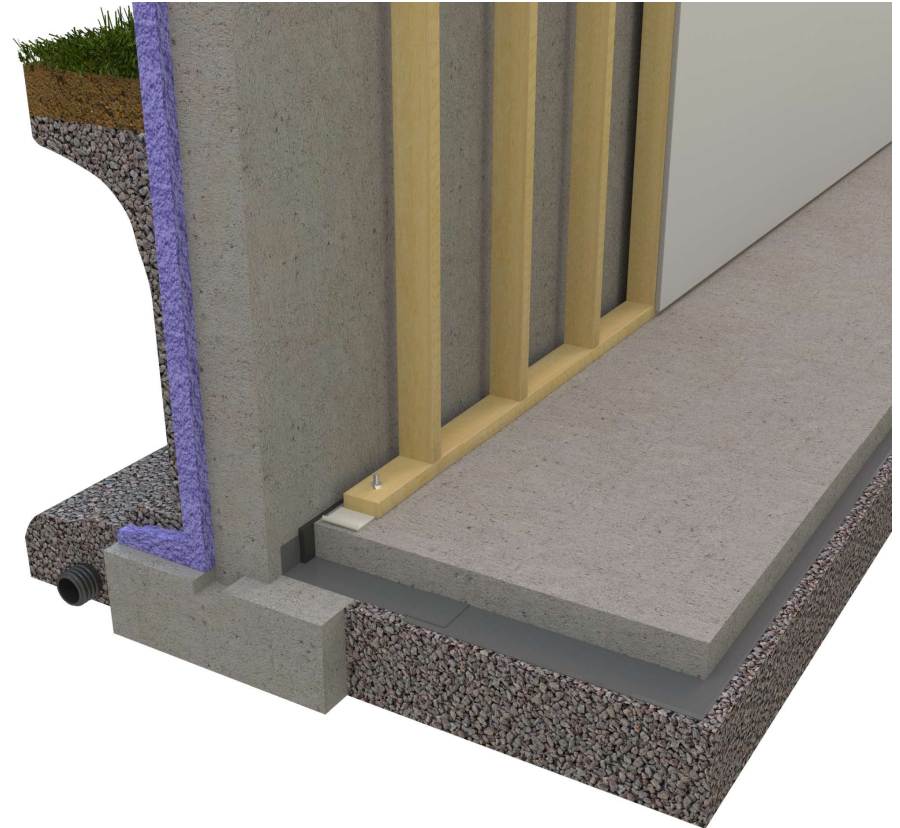
Achieve Continuous Insulation

Allows for air sealing along rim joists

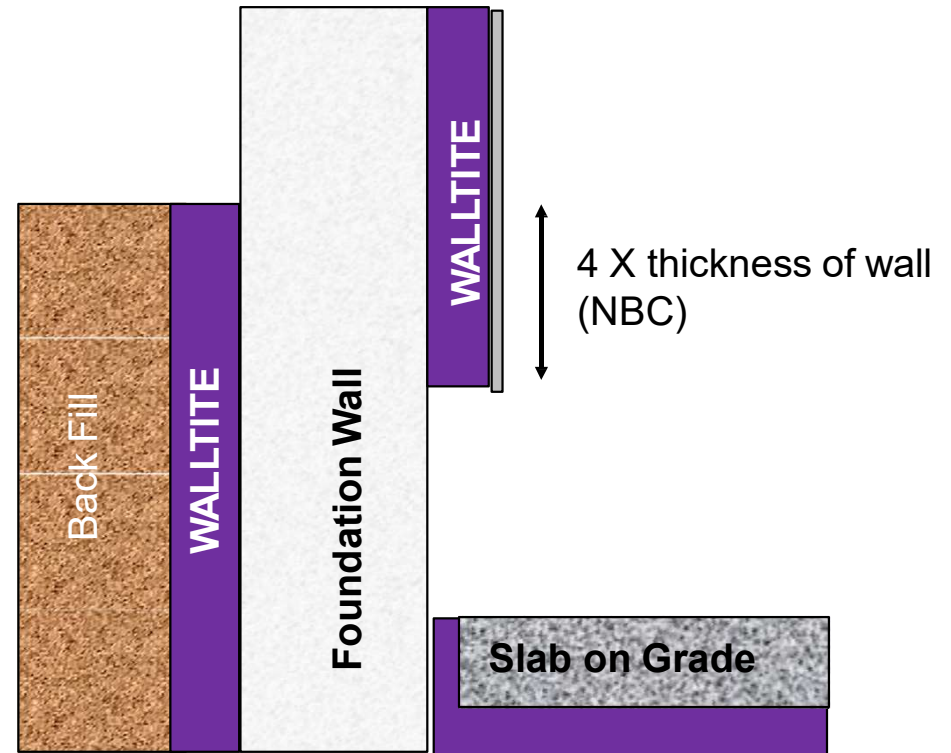
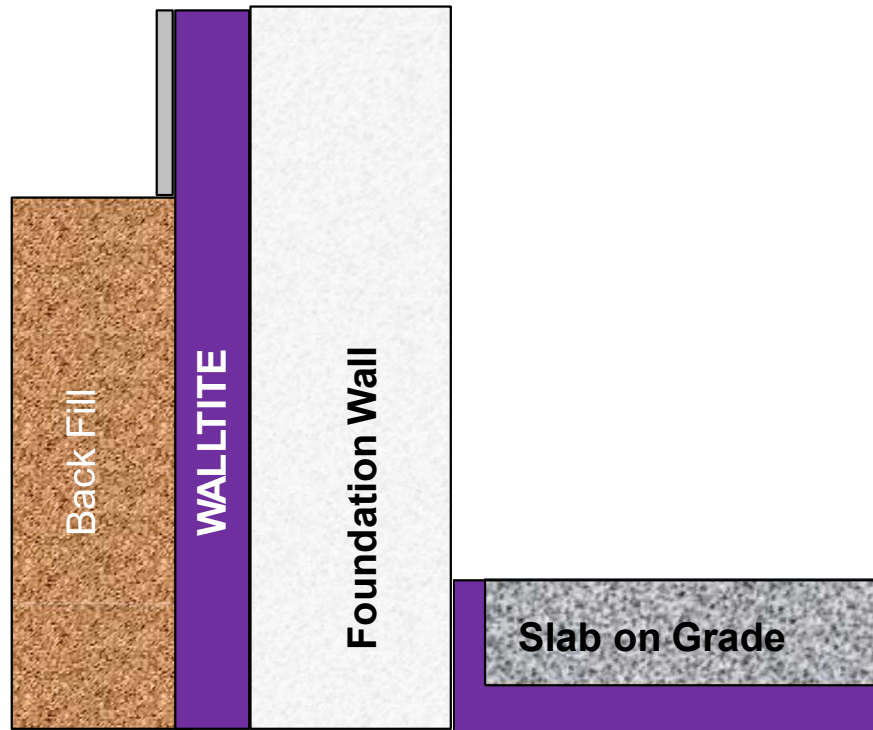
Increases Basement Comfort

Reduces humidity in basement

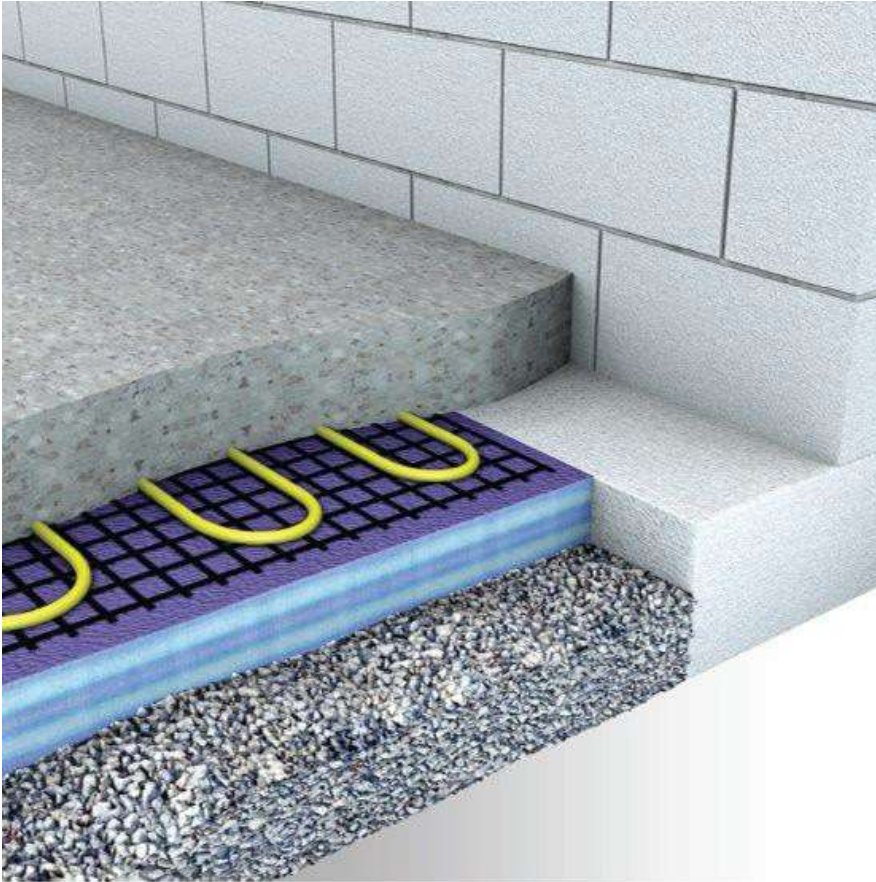
Basements



WALLTITE® CM01 Applications



WALLTITE® CM01 Applications



WALLTITE® CM01 Applications



Soil Gas/Radon Control

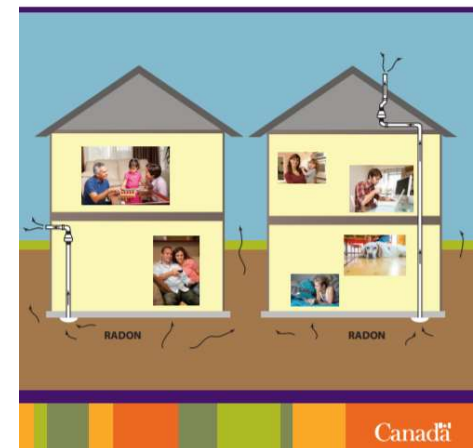
Soil Gas/Radon Control

- Radon is naturally occurring and widespread
- **Second leading cause of lung cancer**
- Referred to in the NBC



RADON

REDUCTION GUIDE FOR CANADIANS



Soil Gas/Radon Control

Entry Points

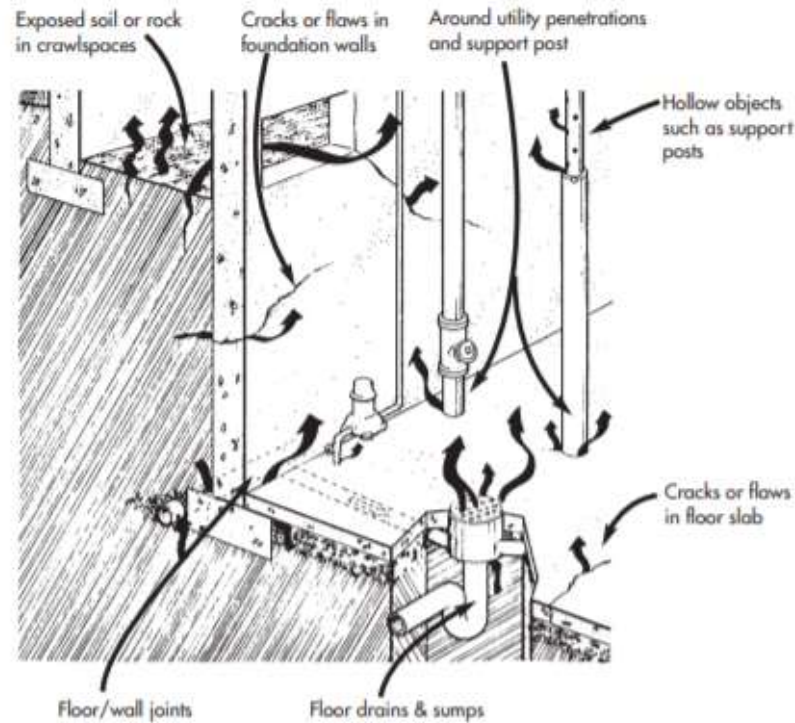


Figure 1 ↑
Typical radon entry routes in poured concrete foundation walls and floors.

https://www.canada.ca/content/dam/hc-sc/migration/hc-sc/ewh-semt/alt_formats/pdf/pubs/radiation/radon_canadians-canadiens/radon_canadians-canadien-eng.pdf

Soil Gas/Radon Control

Entry Points

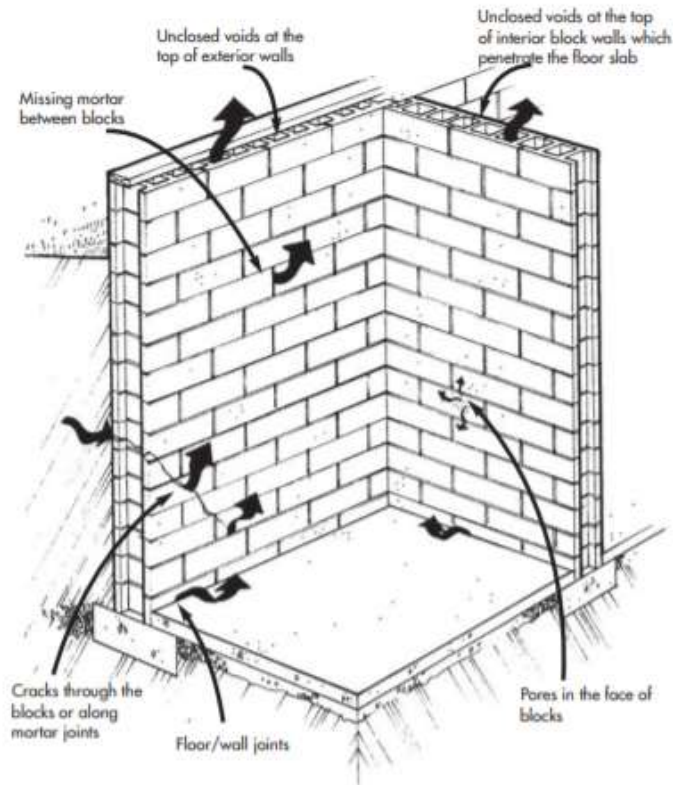


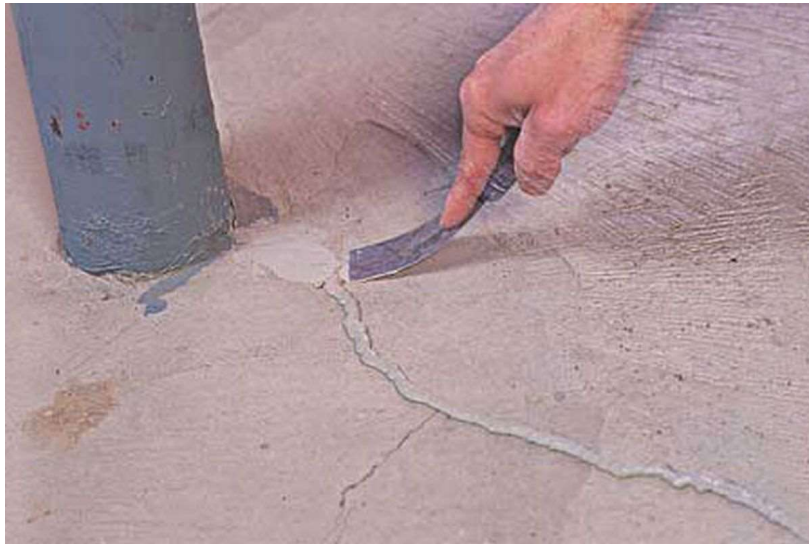
Figure 2 ↑
Typical radon entry routes in concrete block foundation walls.

https://www.canada.ca/content/dam/hc-sc/migration/nc-sc/ewn-semt/air_formats/ppt/pubs/radiation/radon_canaqiains-canadiens/radon_canaqiains-canadien-eng.pdf

Soil Gas/Radon Control

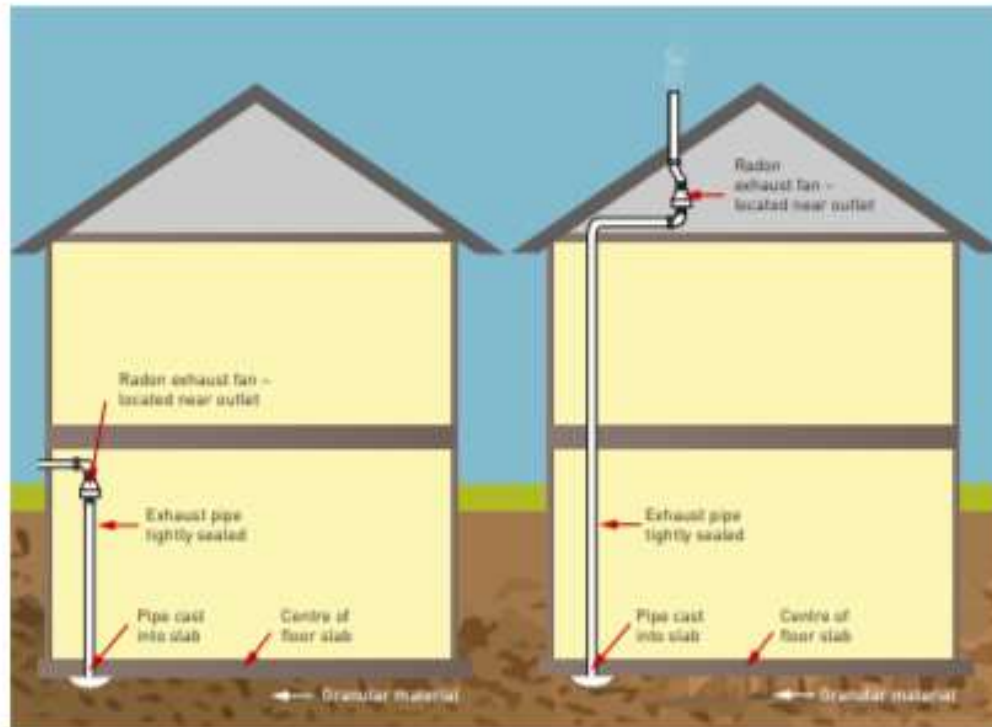
Existing Construction

- Seal ALL cracks
- Add a sub slab depressurization system



Soil Gas/Radon Control

ACTIVE SOIL DEPRESSURIZATION



ACTIVE SUB-SLAB DEPRESSURIZATION

https://www.canada.ca/content/dam/hc-sc/migration/hc-sc/ewh-semt/alt_formats/pdf/pubs/radiation/radon_canadians-canadiens/radon_canadians-canadien-eng.pdf

Soil Gas/Radon Control

New Construction

Controlling Radon infiltration

1. Create a barrier
2. Redirect under slab gas outdoors

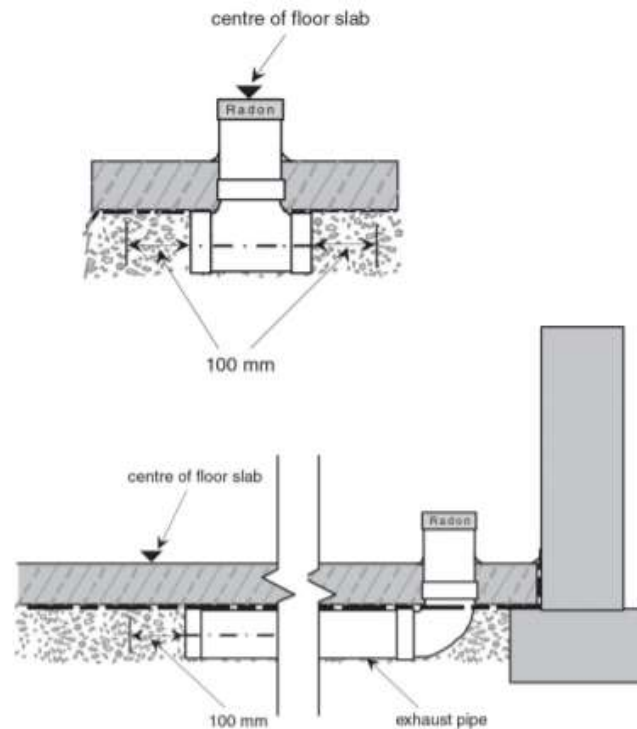


Figure 6 ↑
Example of a rough-in installation for a radon sub-slab
depressurization system

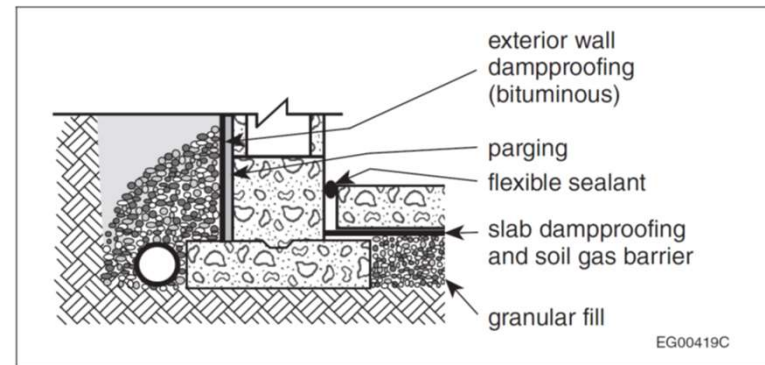
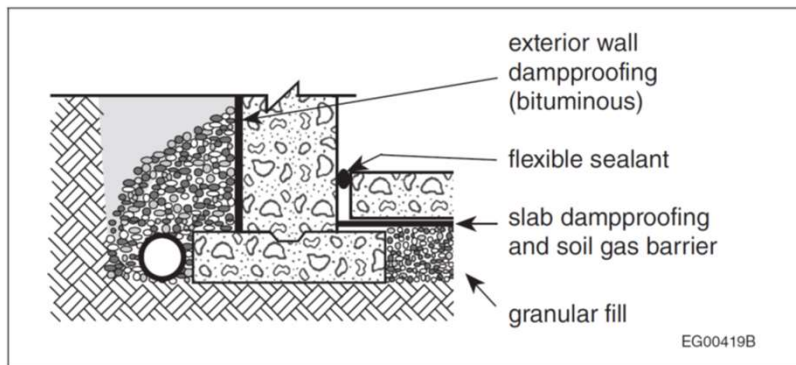
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Soil Gas/Radon Control

National Building Code 2015

9.13.4.2. Protection from Soil Gas Ingress

1) All wall, roof and floor assemblies separating *conditioned space* from the ground shall be protected by an *air barrier system* conforming to Subsection 9.25.3.



Soil Gas/Radon Control



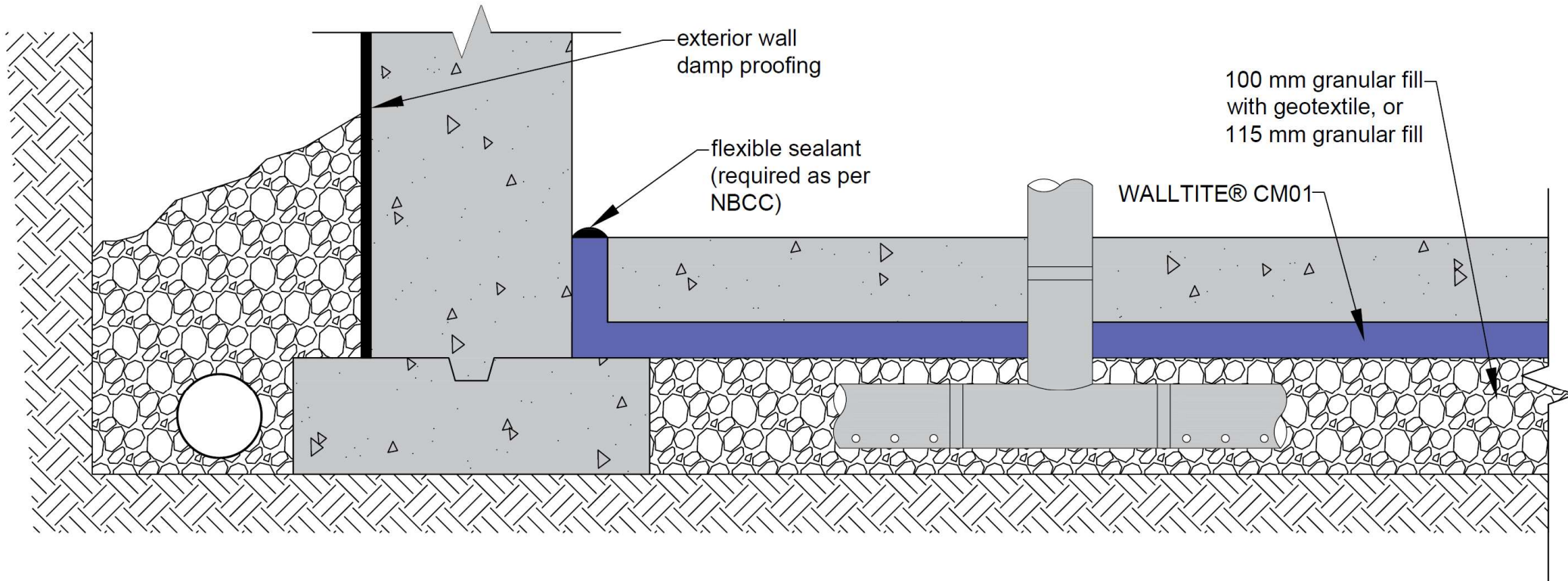
Soil Gas/Radon Control



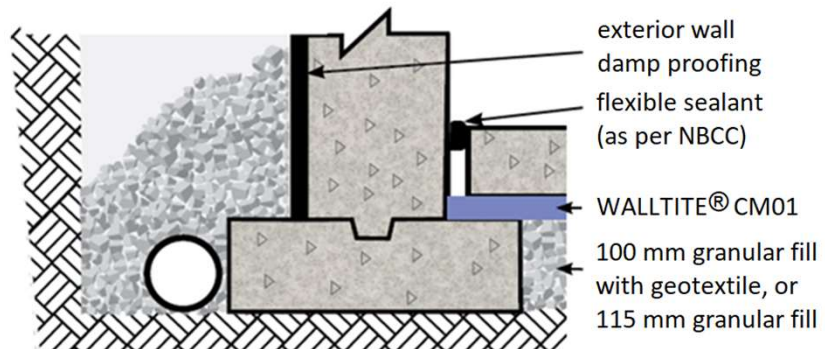
Soil Gas/Radon Control



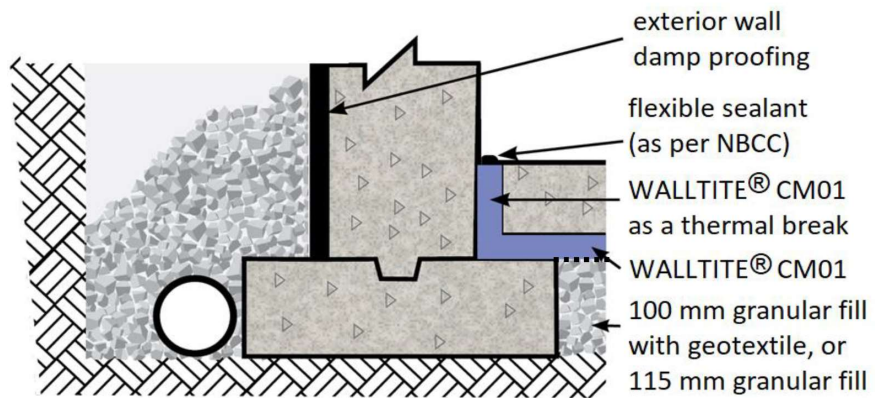
WALLTITE for Radon Control Details



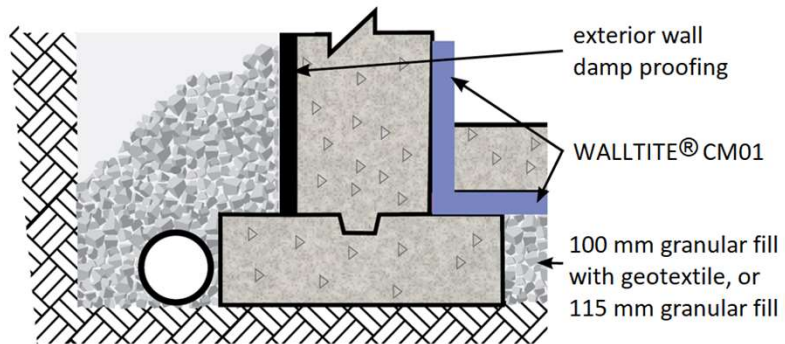
WALLTITE for Radon Control Details



WALLTITE for Radon Control Details



WALLTITE for Radon Control Details



WALLTITE CM01 Application



Soil Gas/Radon Control



Soil Gas/Radon Control

Durability of WALLTITE CM01

- Conforms to the sub grade- no voids beneath
- Compressive Strength ASTM D1621

WALLTITE CM01	XPS (type 4)
34.2 psi	30 psi
236 kPa	210 kPa



Soil Gas/Radon Control

WALLTITE® has been certified by the Canadian Construction Materials Centre (CCMC).



Soil Gas/Radon Control



Evaluation Report CCMC 14152-R WALLTITE® CM01 (Radon Control)

MasterFormat: 07 26 23.01

Evaluation issued: 2020-04-29

1. Opinion

It is the opinion of the Canadian Construction Materials Centre (CCMC) that "WALLTITE® CM01," when used as a soil gas (radon) barrier in accordance with the conditions and limitations stated in Section 3 of this Report, complies with the National Building Code (NBC) of Canada 2015:

"WALLTITE® CM01," when installed at 50 mm, shows better resistance to radon than 6-mil polyethylene (that is, the NBC 2015 benchmark acceptable solution).

Soil Gas/Radon Control

Advantages of using WALLTITE CM01 under slabs on ground

- Compliant: Exceeds code requirements; CCMC 14152-R
- Durable: Conforms to subgrade creating a strong, stable surface. No rocking or cracking
- Simple: Functions as the insulation, radon barrier and vapour barrier
- Cost effective: competitive with systems requiring a separate membrane and sealants

Applications for Spray Foam

COMFORT

Helps prevent air leaks from outside, improving overall comfort of the home



IMPROVED INDOOR AIR QUALITY

A tighter home envelope contributes to lower levels of humidity, dust and pollen inside the home



ENERGY EFFICIENCY

Less energy required for heating and cooling resulting in lower utility usage



Resources

BASF and Building Resource Contact Info:



PMConstruction@basf.com



www.walltite.com



Chris Janzen
Field Applications & Warranties
Manager at BASF Canada



Ibrahim Huseen
Construction & Standards
Regulations Specialist at BASF
Canada

Other Resources:



- Guide Specs
- Specification Update Service
- Effective R-Value Calculations
- Jobsite Inspections
- Third Party Inspections



We create chemistry