

# CCMC 12857-R

## CCMC Canadian code compliance evaluation

<b>CCMC number:</b>	12857-R
<b>Status:</b>	Active
<b>Issue date:</b>	1998-03-12
<b>Modified date:</b>	2023-11-08
<b>Evaluation holder:</b>	<p><b>EIDCA Specialty Products Company (company of DuPont)</b>          6925 Century Avenue, Suite 700          Mississauga ON L5N 7K2          Canada          Telephone: 800-448-9835 / 804-383-4673</p>
<b>Product name:</b>	Tyvek@HomeWrap@– Air Barrier Material
<b>Compliance:</b>	NBC 2015, OBC
<b>Criteria:</b>	CCMC-TG-072709.02-15D, "CCMC Technical Guide for Air Barrier Materials"

**In most jurisdictions this document is sufficient evidence for approval by Canadian authorities.**

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## Compliance opinion

It is the opinion of the Canadian Construction Materials Centre that the evaluated product, when used as as an air barrier material in accordance with the conditions and limitations stated in this evaluation, complies with the following code:

### National Building Code of Canada 2015

Code provision	Solution type
5.4.1.2.(1) Except as provided in Sentence 5.4.1.2.( ...	<u>Acceptable</u>
9.25.3.2.(2) Where polyethylene sheet is used to prov ...	<u>Alternative</u>
9.36.2.10.(1) Materials intended to provide the princi ...	<u>Acceptable</u>

### Ontario Building Code

Ruling No. 10-08-245 (12857-R) authorizing the use of this product in Ontario, subject to the terms and conditions contained in the Ruling, was made by the Minister of Municipal Affairs and Housing on 2010-04-12 (revised 2023-05-23) pursuant to s.29 of the Building Code Act, 1992 (see Ruling for terms and conditions). This Ruling is subject to periodic revisions and updates.

The above opinion(s) is/are based on the evaluation by the CCMC of technical evidence provided by the evaluation holder, and is bound by the stated conditions and limitations. For the benefit of the user, a summary of the technical information that forms the basis of this evaluation has been included.

# Product information

## Product name

Tyvek®HomeWrap®– Air Barrier Material

## Product description

This evaluation addresses the performance of the product as an air barrier material within the DuPont Canada-specified Tyvek® HomeWrap® air barrier system. The DuPont Canada-specified Tyvek® HomeWrap® air barrier system has not been evaluated, but is covered in the [Additional information](#) section of this evaluation for the convenience of building officials and designers.

If the product is installed as part of the designated air barrier system, it will serve a dual function in the wall assembly. Use of the product as a sheathing membrane to control incidental water infiltration behind cladding is covered under a separate CCMC evaluation (see CCMC 12808-R).

The product is a white, spun-bonded olefin material that is made by combining continuous fibres of high-density polyethylene into a sheet using a heat and pressure process. The product is 0.15 mm thick and is available in rolls ranging from 0.91 m to 2.90 m wide and from 30.5 m to 60.9 m long.

## Manufacturing plant

This evaluation is valid only for products produced at the following plant:

Product name	Manufacturing plant
	Richmond, VA, US
Tyvek®HomeWrap®– Air Barrier Material	☑

☑ Indicates that the product from this manufacturing facility has been evaluated by the CCMC

## Conditions and limitations

The CCMC's compliance opinion is bound by this product being used in accordance with the conditions and limitations set out below.

- When the product is installed as part of the main airtight element in the designated air barrier system, the vapour barrier needs only to comply with Article 9.25.4.2., Vapour Barrier Materials, of Division B of the NBC 2015 (i.e. does not need to be continuous but must meet the maximum  $60 \text{ ng}/(\text{Pa}\cdot\text{s}\cdot\text{m}^2)$  requirements and the other applicable requirements of this Article). In cases where another low air and water vapour permeance material has been installed outboard of the innermost impermeable surface of the assembly, then Article 9.25.5.1., General (Properties and Position of Materials in the Building Envelope), of Division B of the NBC 2015 must be met.
- The product must be installed:
  - with the printed side facing outward and protected from exposure to ultraviolet (UV) radiation from the sun within 60 days;
  - with a minimum 10-mm air space between the sheathing membrane and the cladding, unless the cladding has been deemed to not require an air space (e.g., deemed by the CCMC or by building officials based on past cladding performance); and
  - according to DuPont™ Tyvek® Sheathing Membranes and DuPont Self-Adhered Flashing Products Installation Guidelines dated August 2022 (sheathing membrane, air barrier and header wrap). Examples of the installation details are presented under [Technical information](#).
- A concealed air space exceeding 25 mm in width must contain proper fire blocking, in accordance with Subsection 9.10.16., Fire Blocks, of Division B of the NBC 2015.
- Where a CCMC-evaluated sheathing tape in accordance with the MasterFormat 07 25 20 is used to seal joints, the Tyvek® HomeWrap® must be referenced as a tested substrate within the CCMC sheathing tape evaluation report otherwise, its adhesion over the Tyvek® HomeWrap® must be validated by DuPont.

# Technical information

This evaluation is based on demonstrated conformance with the following criteria:

Criteria number	Criteria name
CCMC-TG-072709.02-15D	CCMC Technical Guide for Air Barrier Materials

The evaluation holder has submitted technical documentation for the CCMC's evaluation. Testing was conducted at laboratories recognized by the CCMC. The corresponding technical evidence for this product is summarized below.

## Performance requirements

**Table 1. Results of testing of performance requirements of the product**

Test		Unit	Requirement	Result
Five 1-m <sup>2</sup> membrane specimens tested and measured for air permeance at a minimum of six air pressure differentials ( $\Delta P$ ) between 0 Pa and 300 Pa	unconditioned specimens	L/(s·m <sup>2</sup> )	Air leakage rate at 75 Pa $\Delta P$ (based on linear regression of 30 data points) $\leq$ 0.02 L/(s·m <sup>2</sup> )	0.0071
	conditioned specimens	N/A	Where less than 0.01 L/(s·m <sup>2</sup> ) for unconditioned specimens, the air leakage rate for conditioned specimens must not increase by more than 0.001 L/(s·m <sup>2</sup> ) at 75 Pa pressure difference	Pass
Water vapour transmission	exfiltration direction	ng/(Pa·s·m <sup>2</sup> )	Report value	1 320 ng/(Pa·s·m <sup>2</sup> )
	infiltration direction	ng/(Pa·s·m <sup>2</sup> )	Report value	1 580 ng/(Pa·s·m <sup>2</sup> )

The assessment of the product's durability is covered under CCMC 12808-R.

## Additional information

### An air barrier material as part of an air barrier system

The CCMC has not evaluated the performance of the Tyvek<sup>®</sup> HomeWrap<sup>®</sup> air barrier system in respect of its conformance with Article 9.25.3.2., Air Barrier System Properties, of Division B of the NBC 2015. However, the CCMC's opinion is that an air barrier system using this material and installed in conformance with the details outlined below as well as in DuPont<sup>™</sup> Tyvek<sup>®</sup> Sheathing Membranes and DuPont Self-Adhered Flashing Products Installation Guidelines should satisfy the requirements for continuity of the air barrier system in Articles 9.25.3.1., Required Barrier to Air Leakage, and 9.25.3.3., Continuity of the Air Barrier System, of Division B of the NBC 2015.

## Discussion

Authorities having jurisdiction (AHJ) should be aware that this system differs from the typical air barrier approach, which uses a flexible membrane as the principal plane of airtightness. In the typical approach, the membrane (i.e.,

polyethylene sheet) is normally sandwiched between two other materials so that it is not required to resist, on its own, the full force of indoor/outdoor pressure differences induced by stack effect, mechanical systems and, most importantly, wind.

In a system in which the membrane is applied to the outer surface of the wall sheathing, as it is in the Tyvek® HomeWrap® air barrier system, that membrane does not have continuous support against outward air pressure and must, therefore, have adequate strength to resist that pressure by spanning between points of support, such as its own fastening points or the points where strapping or cladding is fastened to the wall. The CCMC's evaluation of the Tyvek® HomeWrap® material does not include the evaluation of this strength or the strength of the continuity details. The AHJ must, therefore, determine whether the product's air barrier system, described herein, meets the intent of Sentence 9.25.3.2.(1) of Division B of the NBC 2015, as being an effective barrier for the proposed construction in the proposed geographical/climate area. For example, the AHJ may deem the proposed air barrier system adequate for buildings in urban areas, sheltered sites or areas of low wind, based on their experience, but inadequate in areas of high wind and exposed sites in rural or coastal areas.

An air barrier system checklist for the AHJ to consider is below.

An air barrier system must:

- i. have an acceptable low air leakage rate;
- ii. be continuous;
- iii. be durable;
- iv. have sufficient strength to resist the anticipated air pressure load; and
- v. be buildable in the field.

### **Installation details**

The product's material is applied over exterior wood-based wall sheathing material complying with the NBC 2015. It does not contribute to an air barrier system until it is joined to the other components that make up the air barrier system of the building. DuPont™ Tyvek® Sheathing Membranes and DuPont Self-Adhered Flashing Products Installation Guidelines outlines how the product's material must be joined to the foundation wall, to windows and doors, to penetrations in the wall, and to the ceiling air barrier, thus forming the system.

A successful air barrier system installation is predicated on sequencing during construction. Coordination is required during erection of framing and after completion of the air barrier system to ensure that no other trade breaches the integrity of the installed air barrier system.

The proposed air barrier system is defined as possessing the following features:

- i. Tyvek® HomeWrap® material as the principal plane of airtightness;
- ii. accessories including sealants and the CCMC-evaluated sheathing tape that has adhered strength approved by DuPont with Tyvek HomeWrap® to maintain continuity at junctions with penetrations in the wall assembly (i.e., windows, doors, pipes, ducts, electrical outlets, etc.) and in accordance with continuity details in the DuPont™ Tyvek® Sheathing Membranes and DuPont Self-Adhered Flashing Products Installation Guidelines;
- iii. be durable, meeting UV and heat-aging requirements;
- iv. exterior sheathing with specified fasteners and fastening schedule of the Tyvek® HomeWrap® for structural support against anticipated pressure loads; and

- v. be buildable in the field by builders following the DuPont Canada installation manual and reviewed by building officials.

The air barrier system is to be built in the field by informed builders and reviewed by building officials. DuPont Canada has established a field monitoring program to ensure the proper installation of the air barrier system.

The figures below outline typical construction details of the installation of the proposed air barrier system in the field. See DuPont™ Tyvek® Sheathing Membranes and DuPont Self-Adhered Flashing Products Installation Guidelines for additional details.

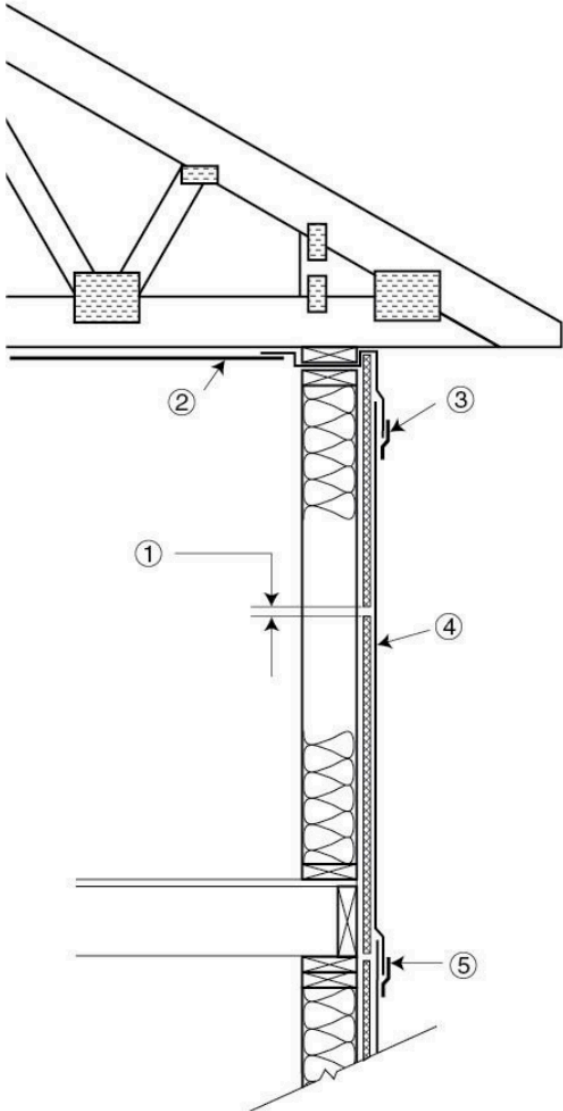


Figure 1. Tyvek® HomeWrap® exterior wall cross-section – top wall/ceiling continuity

1. wood-based sheathing installed with open horizontal gap
2. ceiling air/vapour barrier
3. CCMC-evaluated sheathing tape
4. Tyvek® HomeWrap®
5. typical 100-mm overlap and tape

All horizontal joints in the material must be overlapped by at least 100 mm and taped with CCMC-evaluated sheathing tape (that has adhesion strength with Tyvek® HomeWrap® approved by Dupont). To maintain continuity of the plane of airtightness, the material must be bridge through the top plates and be sealed to the ceiling membrane using an appropriate transition membrane. The material should be secured underneath the transition membrane to ensure proper shingling.

Wood-based sheathing, glass-fibre-faced exterior gypsum board, or exterior gypsum board having a water vapour permeance of less than 60 ng/(Pa·s·m<sup>2</sup>) must be installed in accordance with Article 9.25.5.2., Position of Low Permeance Materials, of Division B of the NBC 2015.

For wood-based sheathing, a gap of not less than 2 mm must be left between sheets in accordance with Article 9.23.16.4., Joints in Panel-Type Sheathing, of Division B of the NBC 2015.

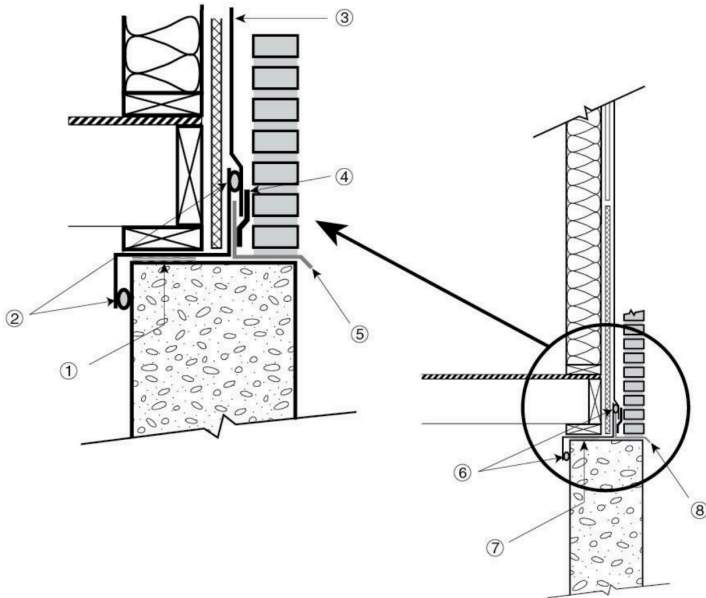


Figure 2. Tyvek® HomeWrap® bottom foundation detail

1. sill plate gasket
2. sealant
3. Tyvek® HomeWrap®
4. tape
5. flashing
6. sealant
7. still plate gasket
8. flashing

When the foundation wall is part of the air barrier system, the material must be sealed to the foundation wall to maintain the continuity of the plane of airtightness. Sealants used must be compatible with the product; for example, silicone-based sealants must not be used. To maintain watertightness, Tyvek® HomeWrap® sheathing membrane must be installed over the flashing and taped to properly drain any rain penetration breaching the cladding.



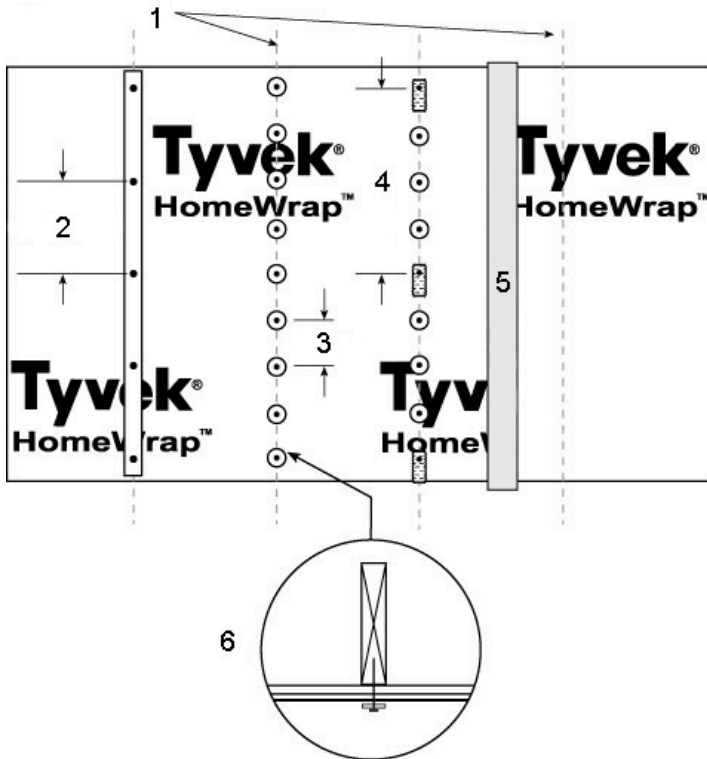


Figure 3. Tyvek® HomeWrap® structural fasteners

1. stud centrelines
2. 300 mm o.c.
3. 150 mm o.c.
4. 600 mm o.c.
5. overlap & tape vertical seams
6. 25 mm cap nails or brick ties to be installed 150 mm o.c. into stud

When installed as the principal plane of airtightness, the product must be structurally attached with nails with plastic washers, screws with plastic washers, 19-mm-thick furring strips or appropriate brick tie anchors as specified by the manufacturer's installation instructions.

For wood-frame construction where the sheathing is plywood, insulated board, glass-fibre-faced exterior gypsum, or exterior gypsum board, use nails with plastic washers and brick tie anchors.

For steel-framed construction where the sheathing is glass-fibre-faced exterior gypsum or exterior gypsum, use screws with washers and brick tie fasteners.

All seams require a 100-mm minimum overlap, and both vertical and horizontal seams should be secured with a CCMC-evaluated sheathing tape.

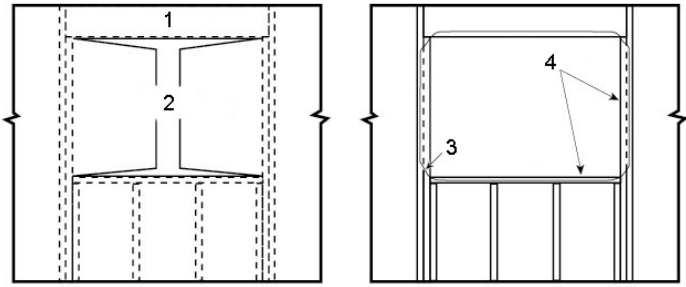


Figure 4. Tyvek® HomeWrap® window and openings

1. outside view
2. make an "I" cut in membrane (outside view)
3. tape cut corners (inside view)
4. fasten Tyvek® HomeWrap® (inside view)

The material must be cut and wrapped around framing at openings (see [Figure 4](#)). Cut ends should then be taped or caulked to the inside frame. To ensure continuity at this junction, a seal must be established with the window or door element (see [Figure 5](#)).

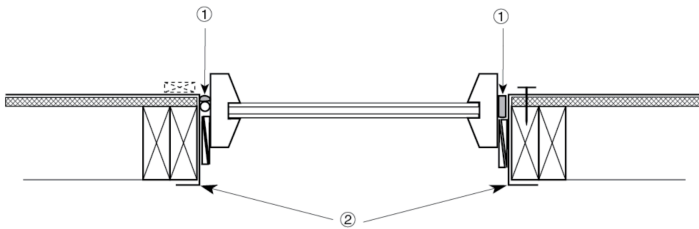


Figure 5. Tyvek® HomeWrap® window frame cross-section

1. seal to window with sealant or foam compatible with Tyvek® HomeWrap® and wood/vinyl/aluminum frames
2. Tyvek® HomeWrap®

The plane of airtightness of the material must be made continuous with windows and doors that are part of the air barrier system for the building envelope. The material must be sealed to the window or door frames with either sealant/backer rod or filled with sealant foam. Sealants must be compatible with the material and adhere to the framing material.

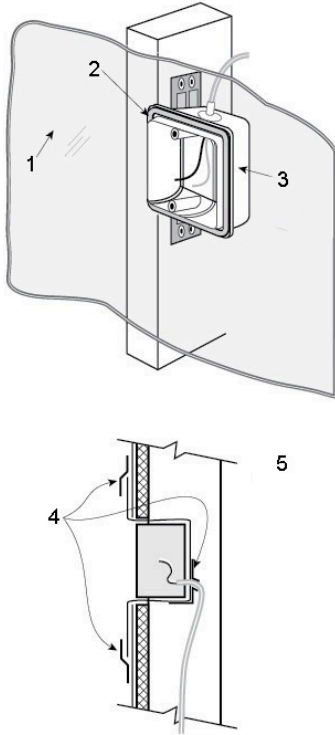


Figure 6. Tyvek® HomeWrap® exterior electrical boxes

1. Tyvek® HomeWrap® installed on sheathing but not shown for clarity
2. snap-on retainer
3. airtight plastic box
4. tape seal
5. seal exterior electrical outlet boxes or use airtight plastic boxes

All exterior electrical boxes or other penetrations through the material must be rendered airtight to maintain the plane of airtightness of the air barrier system. All electrical boxes must be wrapped and taped to the product's membrane, or airtight electrical boxes can be used.

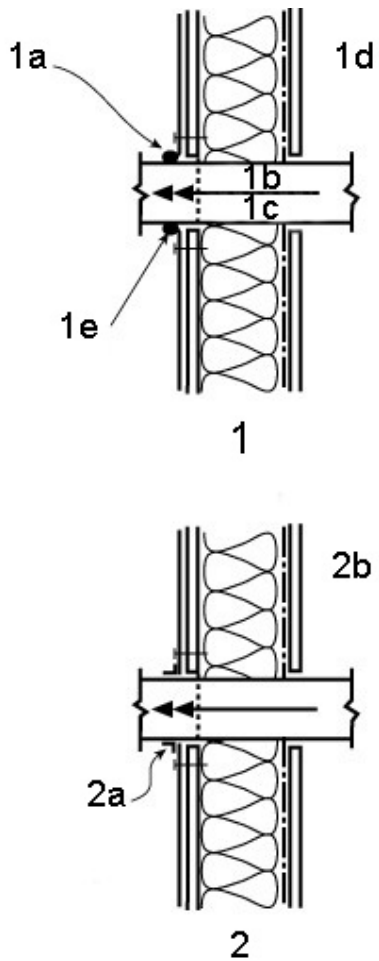


Figure 7. Sealing at wall penetrations

1. Method one
  - a. seal around opening
  - b. air flow
  - c. exhaust
  - d. inside
  - e. proprietary air barrier material around opening
2. Method two
  - a. trim proprietary air barrier material around opening and tape connection
  - b. outside

Where pipes and ducts may breach the Tyvek® HomeWrap® – Air Barrier Material membrane, they must be sealed to the membrane. A sealant bead compatible with the product and the pipe or duct material or the CCMC-evaluated sheathing tape is recommended.

# Administrative information

## Use of Canadian Construction Materials Centre (CCMC) assessments

This assessment must be read in the context of the entire [CCMC Registry of Product Assessments](#), any applicable building code or by-law requirements, and/or any other regulatory requirements (for example, the [Canada Consumer Product Safety Act](#), the [Canadian Environmental Protection Act](#), etc.).

It is the responsibility of the user to confirm that the assessment they are using is current and has not been withdrawn or superseded by a later version on the [CCMC Registry of Product Assessments](#).

## Disclaimer

The National Research Council of Canada (NRC) has evaluated only the characteristics of the specific product described herein. The information and opinions in this evaluation are directed to those who have the appropriate degree of experience to use and apply its contents (such as authorities having jurisdiction, design professionals and specifiers). This evaluation is valid when the product is used as part of permitted construction, respecting all conditions and limitations stated in the evaluation, and in accordance with applicable building codes and by-laws.

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## Language

Une version française de ce document est disponible.

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## CCMC recognition

The Canadian Construction Materials Centre (CCMC) assesses compliance with Canadian building, energy and safety codes. We are the only construction code compliance service supported and operated by the Government of Canada. Trusted by over 6,000 regulators across Canada.

Most Canadian authorities having jurisdiction (AHJs) consider CCMC product assessments acceptable as evidence for product approval.

### CCMC assessments are recognized by construction authorities across Canada:

Alliance of Canadian Building Official Associations (ACBOA)



(Alliance of Canadian Building Official Associations (ACBOA))

First Nations National Building Officers Association (FNNBOA)



(First Nations National Building Officers Association (FNNBOA))

Canadian Home Builders' Association (CHBA)



(Canadian Home Builders' Association (CHBA))

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(Alberta Building Officials Associations (ABOA))

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For more information, contact the CCMC by phone at (613) 993-6189 or by email at [ccmc@nrc-cnrc.gc.ca](mailto:ccmc@nrc-cnrc.gc.ca)

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# Code compliance as an acceptable solution

## Code Compliance via Acceptable Solutions

If a building design (e.g. material, component, assembly or system) can be shown to meet all provisions of the applicable **acceptable solutions** in Division B (e.g. it complies with the applicable provisions of a referenced standard), it is deemed to have satisfied the objectives and functional statements linked to those provisions and thus to have complied with that part of the Code.

— National Building Code of Canada, Sentence A-1.2.1.1.(1)(a)

The CCMC has determined that compliance with this provision of the Code has been demonstrated as an **Acceptable Solution**. The evaluation report provides a summary of the basis of CCMC's compliance opinion.

### CCMC's code compliance opinions

All CCMC evaluation reports are opinions of code compliance established in accordance with the National Building Code of Canada, Subsection 1.2.1. "Compliance with this Code," which requires compliance to be achieved by:

- complying with the applicable acceptable solutions in Division B, or
- using an alternative solution that will achieve at least the minimum level of performance required by Division B in the areas defined by the objective and functional statements attributed to the applicable acceptable solutions.

The CCMC assesses compliance with Canadian building, energy and safety codes, and is trusted by over 6,000 regulators across Canada.



# Code compliance as an alternative solution

## Code Compliance via Alternative Solutions

Where a design differs from the acceptable solutions in Division B, then it should be treated as an **"alternative solution."** A proponent of an alternative solution must demonstrate that the alternative solution addresses the same issues as the applicable acceptable solutions in Division B and their attributed objectives and functional statements. However, because the objectives and functional statements are entirely qualitative, demonstrating compliance with them in isolation is not possible. Therefore, Clause 1.2.1.1.(1)(b) identifies the principle that Division B establishes the quantitative performance targets that alternative solutions must meet. In many cases, these targets are not defined very precisely by the acceptable solutions [...] Nevertheless, Clause 1.2.1.1.(1)(b) makes it clear that an effort must be made to demonstrate that an alternative solution will perform as well as a design that would satisfy the applicable acceptable solutions in Division B—not “well enough” but “as well as.”

— National Building Code of Canada, Sentence A-1.2.1.1.(1)(b)

The CCMC has determined that compliance with this provision of the Code has been demonstrated as an **Alternative Solution**. The evaluation report provides a summary of the basis of CCMC's compliance opinion.

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