

# CCMC 14099-R

## CCMC Canadian code compliance evaluation

<b>CCMC number:</b>	14099-R
<b>Status:</b>	Active
<b>Issue date:</b>	2018-05-30
<b>Modified date:</b>	2024-04-24
<b>Evaluation holder:</b>	<p><b>Epak Inc.</b>                      55 Plymouth Street                      Winnipeg MB R2X 2V5                      Canada                      Website: <a href="http://www.epak.ca">www.epak.ca</a>                      Telephone: 800-665-8083; 204-947-1383                      Email: <a href="mailto:custserv@epak.ca">custserv@epak.ca</a></p>
<b>Product name:</b>	HomeGuard Titan®(Air Barrier Material)
<b>Compliance:</b>	NBC 2015
<b>Criteria:</b>	CCMC-TG-072709.02-15B, "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 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. Air Barrier System Properties	<u>Acceptable</u>
9.25.3.2. Air Barrier System Properties	<u>Alternative</u>
9.36.2.10.(1) Materials intended to provide the princi ...	<u>Acceptable</u>

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

HomeGuard Titan®(Air Barrier Material)

## Product description

This report addresses the performance of the product as an air barrier material within Epak Inc.-specified HomeGuard Titan®/EPAK air barrier system. The air barrier system has not been evaluated, but is covered in "Additional Information: An air barrier material as part of an air barrier system" of this report for the convenience of building officials and designers.

The product is a 0.3-mm-thick, spun-bonded, nonwoven, polypropylene, breathable sheathing membrane. It is white in colour and is available in 0.914-m- to 3.048-m-wide rolls. The roll material is applied over the exterior sheathing material (with the printed side out) so that it forms a continuous envelope around the entire building.

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 report (see CCMC 14071-R).

## Manufacturing plant

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

Product name	Manufacturing plant
	Bugan-Myeon, Korea
HomeGuard Titan®(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.

- The product must demonstrate a sufficiently low air permeance equivalent to the materials outlined in Table A-9.25.5.1.(1), Air and Vapour Permeance Values, and Sentence 9.36.2.10.(1) of Division B of the NBC 2015 to be the principal plane of airtightness in an air barrier system.
- Generally, when the product is installed as part of the airtight element of the proponent's proprietary air barrier system, the vapour barrier only needs to comply with Sentences 9.25.4.2.(1) and (5), Vapour Barrier Materials, of Division B of the NBC 2015. In cases where another low water vapour permeance element has been installed in the wall assembly, Article 9.25.5.1., General, of Division B of the NBC 2015 shall apply.
- 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 deemed by building officials based on past cladding performance).
- The product must be installed in accordance with the most recent update to the air barrier system installation manual.
- 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.
- CCMC-evaluated sheathing tape in accordance with MasterFormat 07 25 20, Sheathing Tape, must be used to seal all joints.

## Technical information

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

Criteria number	Criteria name
CCMC-TG-072709.02-15B	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. Test results for HomeGuard Titan® (Air Barrier Material)/EPAK (Air Barrier Material)

Test	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 250 Pa (unconditioned specimens)	Air leakage rate at 75 Pa $\Delta P$ (based on a linear regression of 30 data points) $\leq 0.02$ L/(s·m <sup>2</sup> )	0.002 L/(s·m <sup>2</sup> )
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 250 Pa (conditioned specimens)	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 permeance (infiltration direction)	When less than 60 ng/(Pa·s·m <sup>2</sup> ), the location of the product installation is restricted by the requirements listed in Article 9.25.1.1 of Division B of the NBC 2015.	5105 ng/Pa·s·m <sup>2</sup>
Water vapour permeance (exfiltration direction)	When less than 60 ng/(Pa·s·m <sup>2</sup> ), the location of the product installation is restricted by the requirements listed in Article 9.25.1.1 of Division B of the NBC 2015.	1885 ng/Pa·s·m <sup>2</sup>

The assessment of the product's durability is covered under CCMC 14071-R.

## Additional Information: An air barrier material as part of an air barrier system

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

The CCMC has not evaluated the product as an air barrier system. Air barrier systems must be installed in conformance with Subsection 9.25.3., Air Barrier Systems, of Division B of the NBC 2015. The following installation details prepared by Epak Inc. provide information on how the product may achieve compliance with the NBC 2015 for air barrier systems.

## 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 HomeGuard Titan<sup>®</sup>/EPAK air barrier system, that membrane does not have continuous support against outward air pressure and must 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 HomeGuard Titan<sup>®</sup> material does not include the evaluation of this strength or the strength of the continuity details.

The AHJ must therefore determine whether the manufacturer'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 the following:

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. Epak Inc.'s installation manual outlines how the product's material must be joined to the foundation wall, windows and doors, penetrations in the wall and 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 the 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. HomeGuard Titan<sup>®</sup> material as the principal plane of airtightness;
- ii. accessories including: sealants and CCMC-evaluated sheathing tape to maintain continuity at junctions with penetrations in the wall assembly (i.e., windows, doors, pipes, ducts, electrical outlets, etc.) and in accordance with the continuity details in Epak Inc.'s installation manual;
- iii. durability, meeting UV and heat-aging requirements;

- iv. exterior sheathing with specified fasteners and fastening schedule of the product for structural support against anticipated pressure loads; and
- v. ability to be built in the field by builders following Epak Inc.'s installation manual and reviewed by building officials.

The figures below outline typical construction details of the installation of the proposed air barrier system in the field. See Epak's HomeGuard Titan® installation manual for additional details.

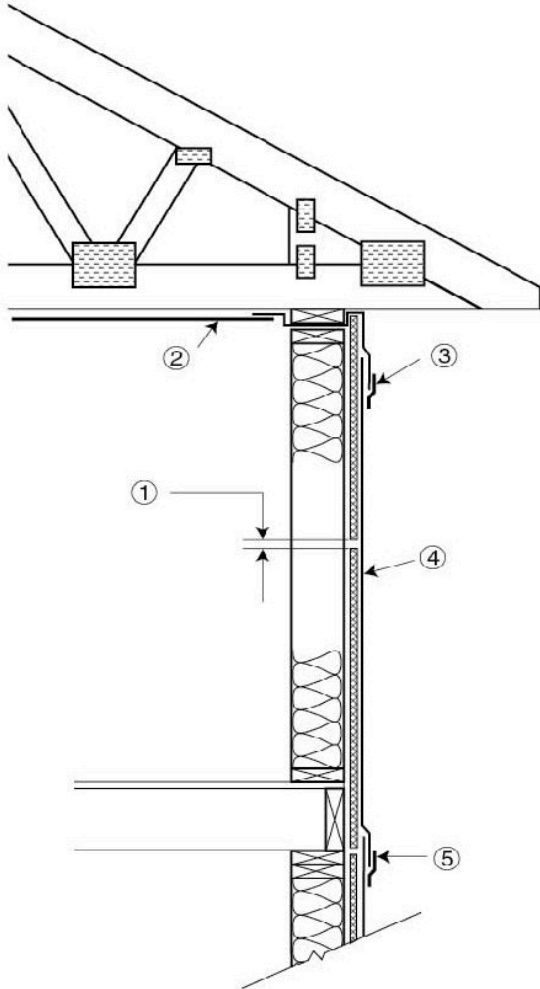


Figure 1. Exterior wall cross-section – top wall/ceiling continuity

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

All horizontal joints in the material must be overlapped 100 mm and taped with CCMC-evaluated sheathing tape. To maintain continuity of the plane of airtightness, the material must bridge through the top plates and be taped to the ceiling membrane. Wood-based sheathing not more than 12.5 mm thick and complying with Article 9.23.16.2., Material Standards, of Division B of the NBC 2015 does not require special joint treatment.

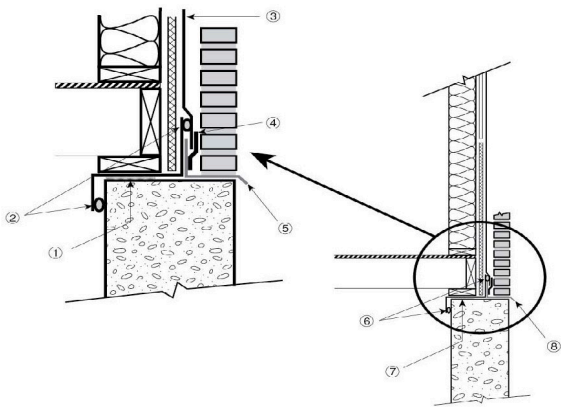


Figure 2. Bottom foundation detail

1. sill plate gasket
2. sealant
3. proprietary air barrier material
4. tape
5. flashing
6. sealant
7. sill 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. Sealant used must be compatible with the product (e.g., silicone-based sealants must not be used). To maintain watertightness, the product's sheathing membrane must be installed over the flashing and taped to properly drain any rain penetration breaching the cladding.

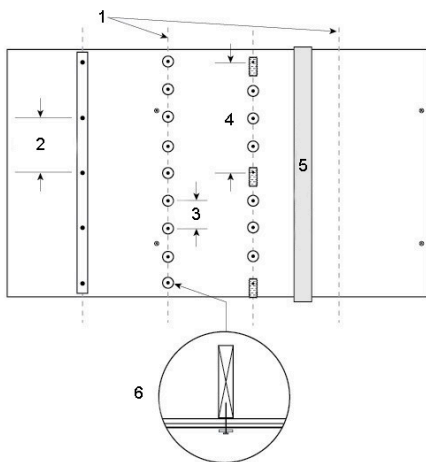


Figure 3. Structural fasteners, showing 25-mm cap nails or brick ties to be installed 150 mm o.c. into stud, 300 mm o.c., stud centrelines, 150 mm o.c., 600 mm o.c., and overlap and tape vertical seams

1. stud centerlines
2. 300 mm o.c.
3. 150 mm o.c.
4. 600 mm o.c.
5. overlap and 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 either 19-mm-thick furring strips, 25-mm-diam cap nails, or brick ties. These attachments must be fastened to the framing members and spaced as specified by Epak Inc. (see the installation manual).

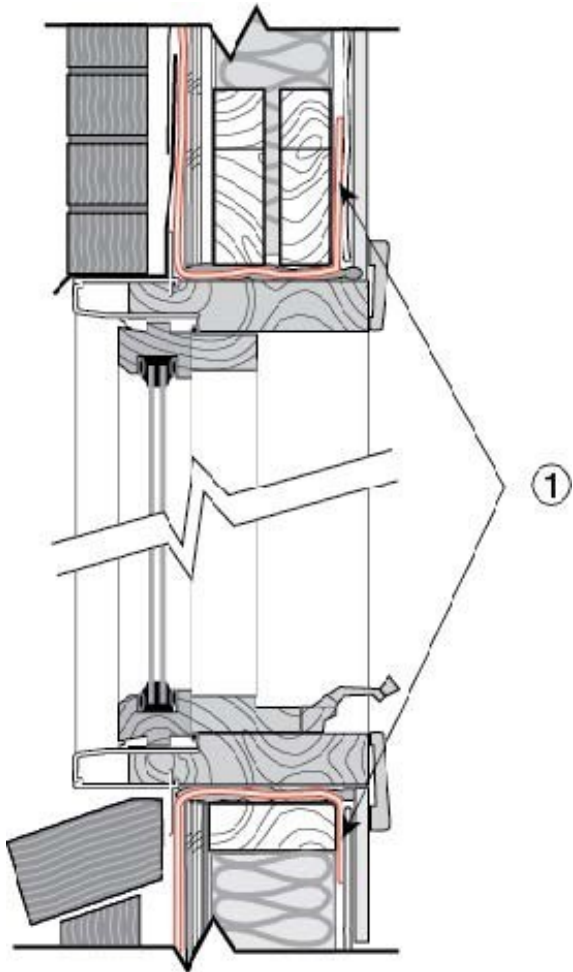


Figure 4. Window and door openings

1. proprietary air barrier material folded back inside window frame

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](#)).

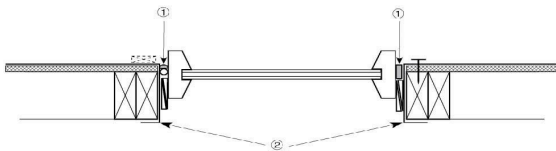


Figure 5. Window frame cross-section

1. seal to windows with sealant or foam compatible with the proprietary air barrier material and wood/vinyl/aluminum frames
2. proprietary air barrier material

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.

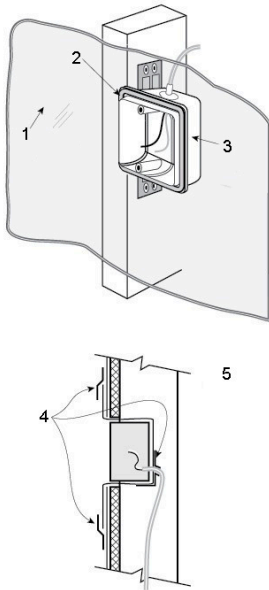


Figure 6. Exterior electrical boxes, showing proprietary air barrier material installed on sheathing but not shown for clarity, snap-on retainer, airtight plastic box, tape seal, and seal exterior electrical outlet boxes or use airtight plastic boxes

1. proprietary air barrier material 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.

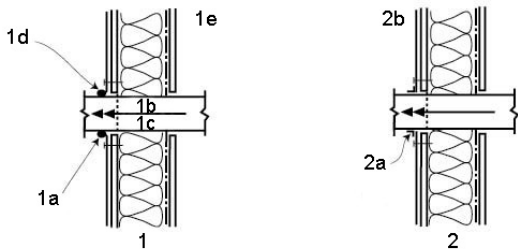


Figure 7. Sealing at wall penetrations, showing inside/outside

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

b. outside

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

## Administrative information

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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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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:

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(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))

Alberta Building Officials Association (ABOA)



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(Manitoba Building Officials Association (MBOA))

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New Brunswick Building Officials Association (NBBOA)



(New Brunswick Building Officials Association (NBBOA))

Nova Scotia Building Officials Association (NSBOA)



(Nova Scotia Building Officials Association (NSBOA))

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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

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## 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.

### CCMC's code compliance opinions

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