

CCMC 14461-R

CCMC Canadian code compliance evaluation

CCMC number:	14461-R
Status:	Active
Issue date:	2022-05-05
Modified date:	2023-02-24
Evaluation holder:	National Shelter Products, Inc. 10 W. Streetsboro St. #207 Hudson OH 44236 United States
Product name:	DRYline® MP - Air Barrier Material
Compliance:	NBC 2015
Criteria:	CCMC-TG-072709.02-15 "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 for exterior walls of buildings 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. Construction of Air Barrier Details	<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

DRYline® MP - Air Barrier Material

Product description

This evaluation addresses the performance of the product as an air barrier material as specified by National Shelter Products, Inc. The DRYline® MP air barrier system has not been evaluated, but is covered in Appendix A 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 14411-R).

DRYline® MP consists of two primary components: a non-woven polyester substrate that is laminated to a microporous, vapour-permeable polyolefin film barrier. The construction of the laminated material allows it to resist the passage of bulk moisture while maintaining a high degree of moisture vapour permeability.

The product is 0.35 mm thick and comes in rolls that range from 0.91 m to 3.05 m wide and 27 m to 45 m long. The colour is white.

Manufacturing plant

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

Product name	Manufacturing plant
	Richmond, VA, US
DRYline® MP - 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 has demonstrated a sufficiently low air permeance, equivalent to the materials outlined in Table A-9.25.5.1.(1), Air and Vapour Permeance Values, Sentence 9.36.2.10.(1) and Sentence 5.4.1.2.(1) of Division B of the NBC 2015, and can be considered as 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 needs to comply with Article 9.25.4.2., 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 (Properties and Position of Materials in the Building Envelope), of Division B of the NBC 2015 must apply depending on the location of these materials in the wall assembly.
- 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 not to require an air space (e.g. by the CCMC or by building officials based on past cladding performance); and
 - according to the National Shelter Products, Inc. DRYline[®] MP installation manual (sheathing membrane, air barrier and header wrap). Examples of the installation details are presented in "Additional information: An air barrier material as part of an air barrier system".
- A concealed air space exceeding 25 mm in width must contain proper fire blocks 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 MasterFormat 07 25 20 is used to seal joints, its adhesion over DRYline[®] MP - Air Barrier Material must be validated by National Shelter Products, Inc.
- The product must be clearly identified with the phrase "CCMC 14461-R."

Technical information

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

Criteria number	Criteria name
CCMC-TG-072709.02-15	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.

The durability assessment of DRYline® MP is covered under CCMC 14411-R with additional aging standards in CAN/ULC-S741-08, "Standard for Air Barrier Materials - Specification."

Performance requirements

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

Test	Unit	Requirement	Result
Tested as per CAN/ULC-S741-08 with five 1 m ² membrane specimens and measured for air permeance at a minimum of six air pressure differentials (ΔP) between 0 and 300 Pa - unconditioned prior to ultraviolet (UV) radiation and heat aging	L/(s·m ²)	Air leakage rate at 75 Pa ΔP (based on a linear regression of 30 data points) ≤ 0.02 L/(s·m ²)	< 0.0005 (1)
Five 1 m ² membrane specimens tested and measured for air permeance at a minimum of six air pressure differentials (ΔP) between 0 and 300 Pa - conditioned after UV radiation and heat aging	L/(s·m ²)	Where less than 0.01 L/(s·m ²) for unconditioned specimens, the increase of the air leakage rate at 75 Pa ΔP for conditioned specimens ≤ 0.001 L/(s·m ²)	< 0.0005 (1) (2) < 0.001 (3)
Water vapour permeance (infiltration direction)	ng/(Pa·s·m ²)	When less than 60 ng/(Pa·s·m ²), 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.	1 384
Water vapour permeance (exfiltration direction)	ng/(Pa·s·m ²)	When less than 60 ng/(Pa·s·m ²), 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.	1 308

Notes:

- 1 Test results were less than 0.0005 L/(s·m²) due to the limits of the measuring equipment.
- 2 Test result (air leakage rate) for the conditioned specimens after UV radiation and heat aging.
- 3 Increase of the air leakage rate for conditioned specimens after UV radiation and heat aging.

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Additional information

An air barrier material as part of an air barrier system

The CCMC has not evaluated the performance of the National Shelter Products, Inc. DRYLine® MP air barrier system as to 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 the National Shelter Products, Inc. installation manual, 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. a 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 proposed air barrier system, that membrane does not have a continuous support against outward air 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 this material **does not include the evaluation of this strength** or the strength of the continuity details. Therefore, the AHJ must 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 of 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.

The following is a checklist for the AHJ to consider; 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. The National Shelter Products, Inc. installation manual outlines how the product's material must be joined to the foundation wall, windows, doors, penetrations in the wall and the ceiling air barrier in order to form 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. DRYline® MP material as the principal plane of airtightness;
- ii. accessories, including sealants and CCMC-evaluated sheathing tape (for which the adhesion strength over the product has been validated by National Shelter Products, Inc.) that maintain continuity at junctions with penetrations in the wall assembly (i.e. windows, doors, pipes, ducts, electrical outlets, etc.) and that are in accordance with continuity details in the National Shelter Products, Inc. installation manual;
- iii. durability, meeting UV- and heat-aging requirements; and
- iv. exterior sheathing with specified fasteners and fastening schedule of the product for structural support against anticipated pressure loads.

The air barrier system is to be built in the field by informed builders and reviewed by building officials.

The figures below outline typical construction details on the installation of the product as an air barrier system in the field. See the National Shelter Products, Inc. DRYline® MP air barrier material installation manual for additional details.

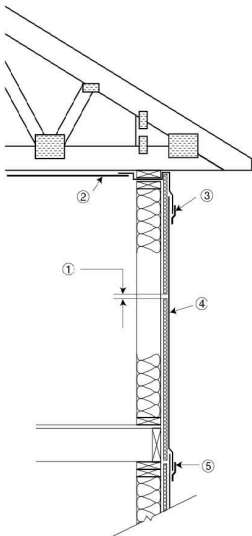


Figure 1. Exterior wall cross-section of the product – top wall/ceiling continuity

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 of 100 mm of the proprietary air barrier material and tape

All horizontal joints in the material must be overlapped by 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.. 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·m²) must be installed in accordance with Article 9.25.5.2., Position of Low

Permeance Materials, of Division B of the NBC 2015. Wood-based sheathing not more than 12.5 mm thick and complying with Article 9.23.17.2., Thickness, Rating and Materials Standards of Division B of the NBC 2015 does not required special joints treatment.

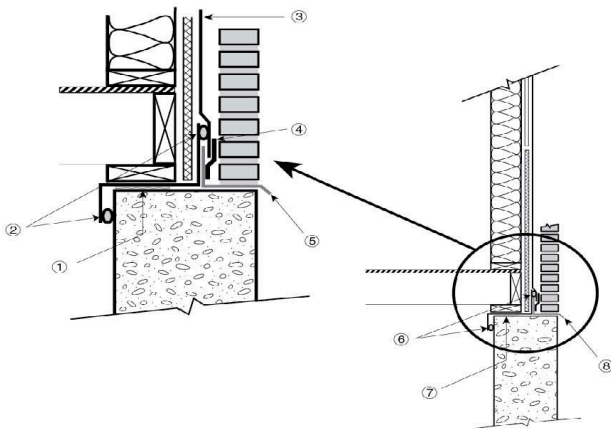


Figure 2. Bottom foundation detail for the product

1. sill plate gasket
2. sealant
3. proprietary air barrier material
4. tape
5. flashing
6. sealant
7. sill plate gasket
8. flashing

Since the foundation wall is part of the air barrier system, the product must be sealed to the foundation wall to maintain the continuity of the plane of airtightness. The sealant used must be compatible with the product. For example, 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.

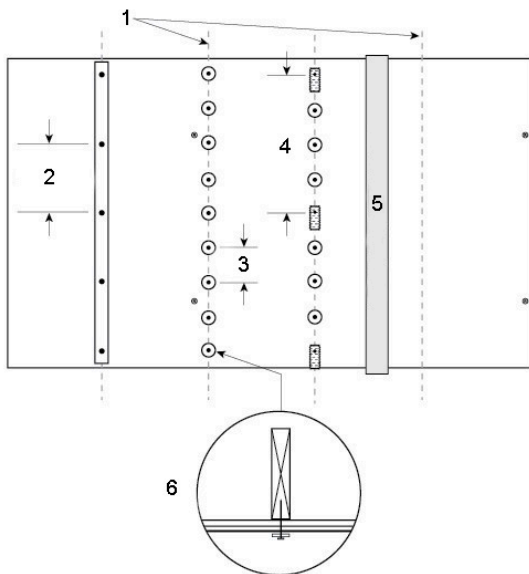


Figure 3. Structural fasteners for the product

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1. stud centrelines
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 using nails with plastic washers, screws with plastic washers or appropriate brick tie anchors.

For wood-framed construction where the sheathing is either 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 either 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 the vertical and horizontal seams should be secured with CCMC-evaluated sheathing tape.

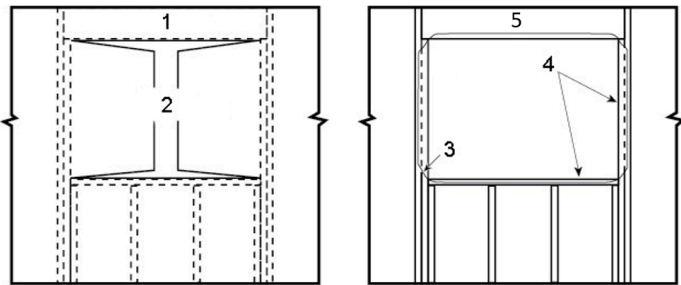


Figure 4. Window and door openings

1. outside view
2. make an inverted "Y" cut in membrane
3. tape cut corners
4. fasten proprietary barrier material to sides and bottom
5. interior 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).

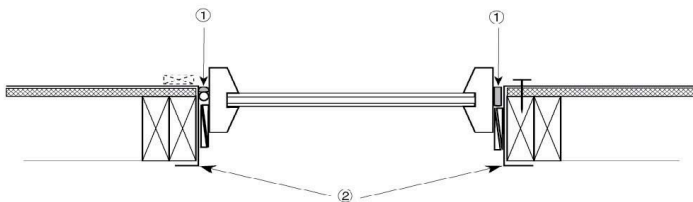


Figure 5. Window frame cross-section

1. seal to window 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 must adhere to the framing material.

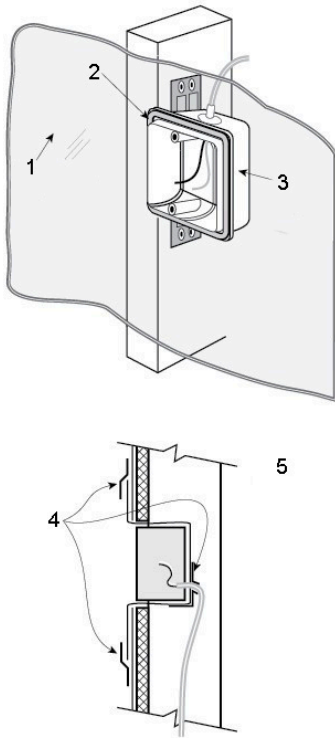


Figure 6. Exterior electrical boxes

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.

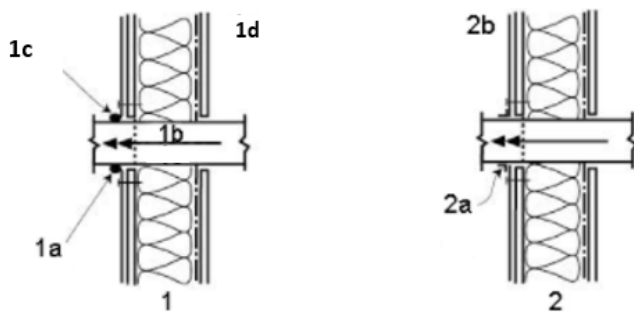


Figure 7. Sealing at wall penetrations

1. method one
 - a. proprietary air barrier material around opening
 - b. exhaust air flow

- c. seal around opening
- d. inside
- 2. method two
 - a. trim proprietary air barrier material around opening and tape connection
 - b. outside

Where pipes and ducts breach the product's 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

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](#).

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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

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

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(Alliance of Canadian Building Official Associations (ACBOA))

First Nations National Building Officers Association (FNNBOA)



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Canadian Home Builders' Association (CHBA)



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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

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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.

CCMC's code compliance opinions

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