



Evaluation Report CCMC 13633-R REX WRAP FORTIS (Air Barrier Material)

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1. Opinion

It is the opinion of the Canadian Construction Materials Centre (CCMC) that “REX WRAP FORTIS (Air Barrier Material)”, when used as an air barrier material in accordance with the conditions and limitations stated in Section 3 of this Report, complies with the National Building Code 2010:

- Clause 1.2.1.1.(1)(b), Division A, as an alternative solution that achieves at least the minimum level of performance required by Division B in the areas defined by the objectives and functional statements attributed to the following applicable acceptable solutions:
 - Sentence 5.4.1.2.(1), Air Barrier System Properties
 - Sentence 9.25.3.2.(1), Air Barrier System Properties

This opinion is based on CCMC’s evaluation of the technical evidence in Section 4 provided by the Report Holder.

Ruling No. 14-16-312 (13633-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 2014-10-27 (revised 2017-05-04) 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.

2. Description

This Report addresses the performance of the product as an air barrier material within the Alpha ProTech “REX WRAP FORTIS” air barrier system (the air barrier system has not been evaluated, but is covered in Appendix A of this Report for the convenience of building officials and designers).

The product consists of two layers, a non-woven polyester layer and a polyethylene blown film with a polyester/polyethylene mesh, which are bonded together with a hot-melt adhesive resulting in a total thickness of 0.18 mm to 0.23 mm. The product is available in rolls of various widths and lengths. The rolled material is applied over 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 13168-R).

3. Conditions and Limitations

CCMC’s compliance opinion in Section 1 is bound by the “REX WRAP FORTIS (Air Barrier Material)” being used in accordance with the conditions and limitations set out below:

- The product must demonstrate a sufficiently low air permeance equivalent to that of the materials outlined in Table A-9.25.5.1.(1) and Sentence 5.4.1.2.(1) of Division B of the NBC 2010 in order to be the principal plane of airtightness in an air barrier system.

- Generally, where the product is installed as part of the airtight component of the manufacturer’s proprietary air barrier system, the vapour barrier need only comply with Sentences 9.25.4.2.(1), (2), (5) and (6), Vapour Barrier Materials, of Division B of the NBC 2010; in cases where another low water vapour permeance component has been installed in the wall assembly, Sentences 9.25.4.2.(3) and (4) apply.
- The product must be installed:
 - with the printed side facing outward and be 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 CCMC or deemed by building officials based on past cladding performance);
 - in accordance with the most recent update to the Alpha ProTech “REX WRAP FORTIS” Air Barrier System Installation Manual (examples of the installation details are presented under Additional Information in the Appendix of this Report).
- A concealed air space that is more than 25 mm wide must contain proper fire blocking, in accordance with Subsection 9.10.16., Fire Blocks, of Division B of the NBC 2010.
- All joints must be sealed with CCMC-evaluated sheathing tape in accordance with MasterFormat 07 25 20.

4. Technical Evidence

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

4.1 Performance Requirements

Table 4.1 Results of Testing the Performance Requirements of the Product

Property	Requirement	Result
Five 1 m² membrane specimens tested and measured for air permeance at a minimum of six air pressure differentials (ΔP) between 0 Pa and 300 Pa	Air leakage rate at 75 Pa ΔP (based on linear regression of 30 data points) ≤ 0.02 L/(s·m ²)	0.0008 L/(s·m ²)

The assessment of the product’s durability is covered under CCMC Report 13618-R.

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Date modified:

2017-09-05

Appendix – Additional Information

An Air Barrier Material as Part of an Air Barrier System

CCMC has not evaluated the performance of the “REX WRAP FORTIS” air barrier system in respect of its conformance with Article 9.25.3.2., Air Barrier System Properties, of Division B of the NBC 2010. However, 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 Alpha ProTech 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 2010.

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 “REX WRAP FORTIS” 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. CCMC’s evaluation of the “REX WRAP FORTIS” 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 2010, 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.

The following air barrier system checklist is to be considered by the AHJ. 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 2010. 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 Alpha ProTech Installation Manual 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. “REX WRAP FORTIS” 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 continuity details in the Alpha ProTech Installation Manual;
- iii. be durable, meeting UV and heat-aging requirements;
- iv. exterior sheathing with specified fasteners and fastening schedule of the “REX WRAP FORTIS” for structural support against anticipated pressure loads; and
- v. be buildable in the field by builders following the Alpha ProTech Installation Manual and reviewed by building officials.

Figures 1 to 7 outline typical construction details of the installation of the proposed air barrier system in the field. See the Alpha ProTech “REX WRAP FORTIS” Installation Manual for additional details.

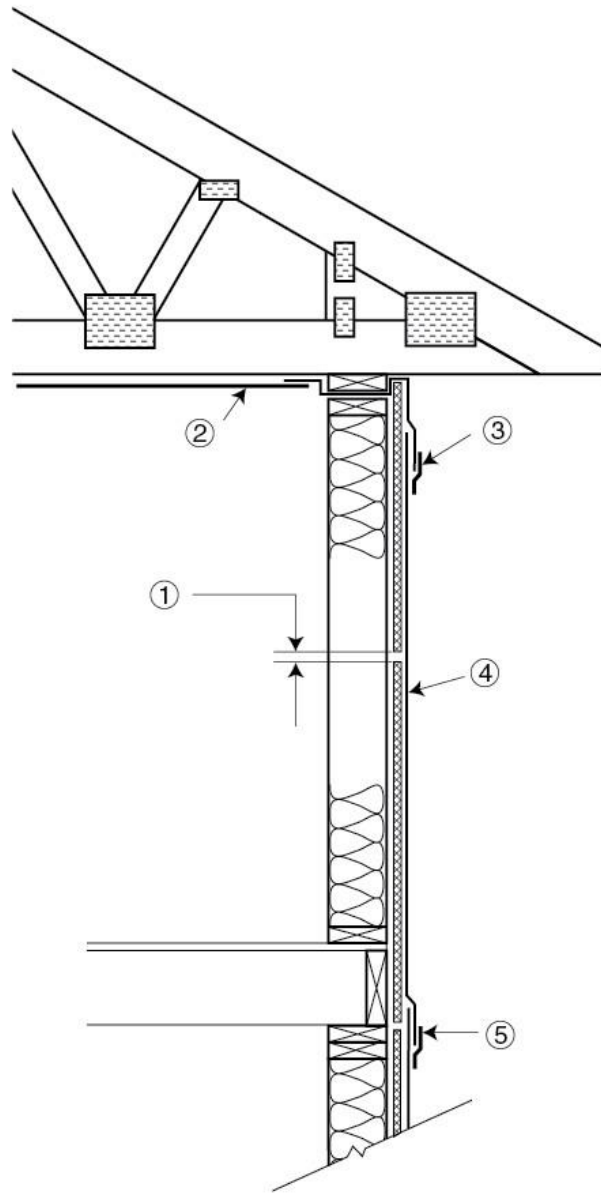


Figure 1. Exterior wall cross-section – top wall/ceiling continuity:

1. wood-based sheathing installed with open horizontal gap
2. ceiling air/vapour barrier
3. CCMC-evaluated sheathing tape
4. “REX WRAP FORTIS (Air Barrier Material)”
5. typical 100-mm overlap 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 9.23.17.2., Thickness, Rating and Material Standards, of Division B of the NBC 2010, does not require special joint treatment.

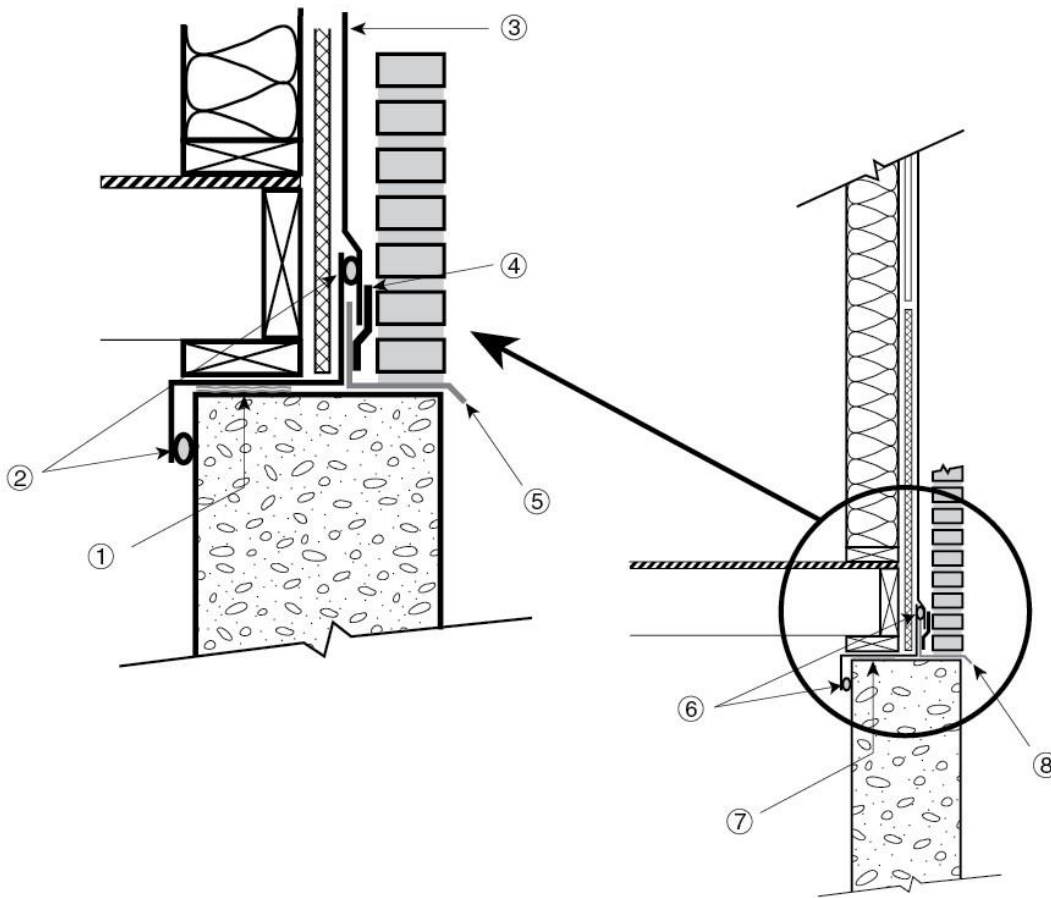


Figure 2. Bottom foundation detail:

- 1. sill plate gasket**
- 2. sealant**
- 3. “REX WRAP FORTIS (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. The sealant used must be compatible with the product; for example, silicone-based sealants must not be used. To maintain watertightness, the “REX WRAP FORTIS” sheathing membrane must be installed over the flashing and taped to properly drain any rain penetration breaching the cladding.

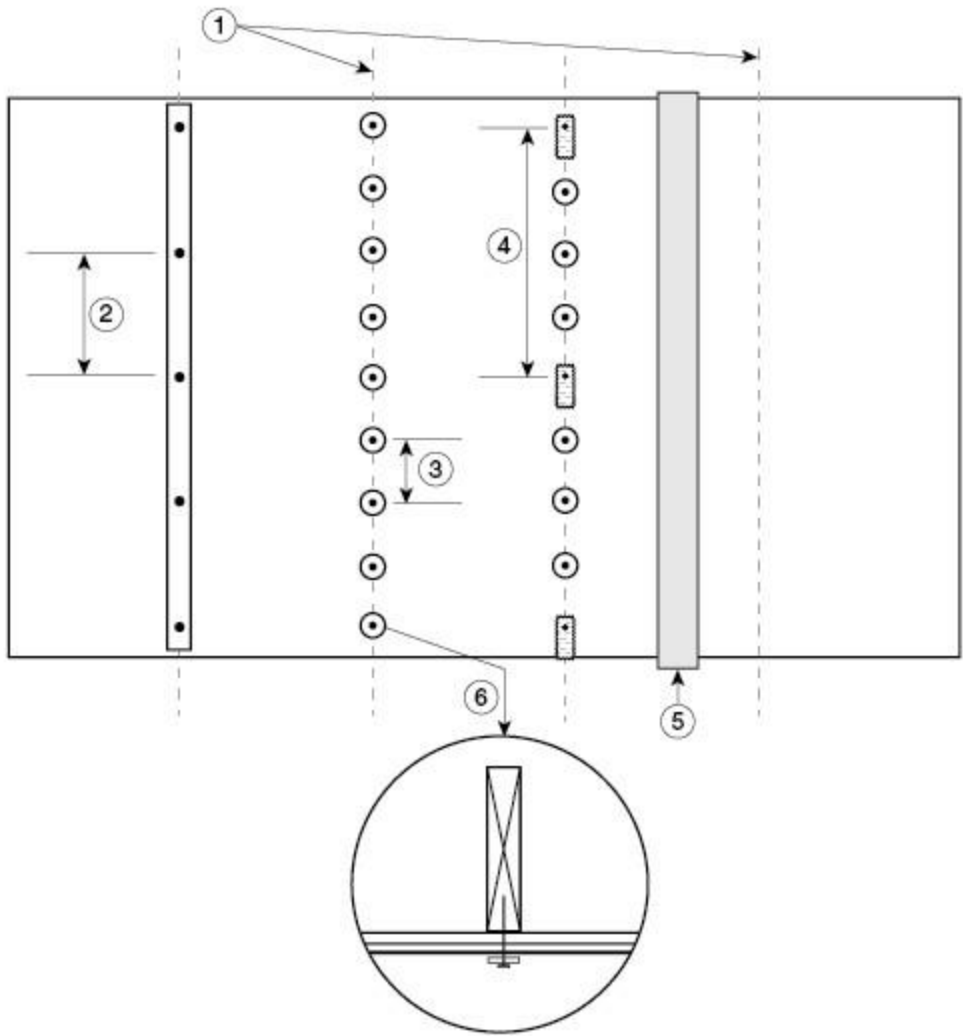


Figure 3. Structural fasteners:

1. stud centre lines
2. if securing “REX WRAP FORTIS (Air Barrier Material)” with furring, space 25-mm cap nails 300 mm on centre (o.c.)
3. if securing “REX WRAP FORTIS (Air Barrier Material)” to studs, space 25-mm cap nails 150 mm o.c.
4. if securing “REX WRAP FORTIS (Air Barrier Material)” with brick ties, space them at a maximum of 600 mm o.c. and 25-mm cap nails at 150 mm o.c. between brick ties
5. material is overlapped and vertical seams are taped
6. figure call-out showing cap nail in stud

When installed as the principal plane of airtightness, the product must be structurally attached with 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 the Alpha ProTech Installation Manual.

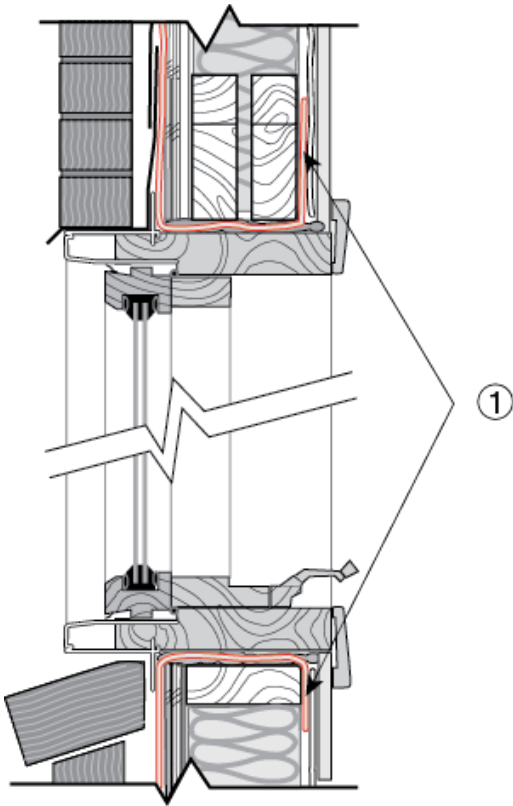


Figure 4. Window and door openings:

1. “REX WRAP FORTIS (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).

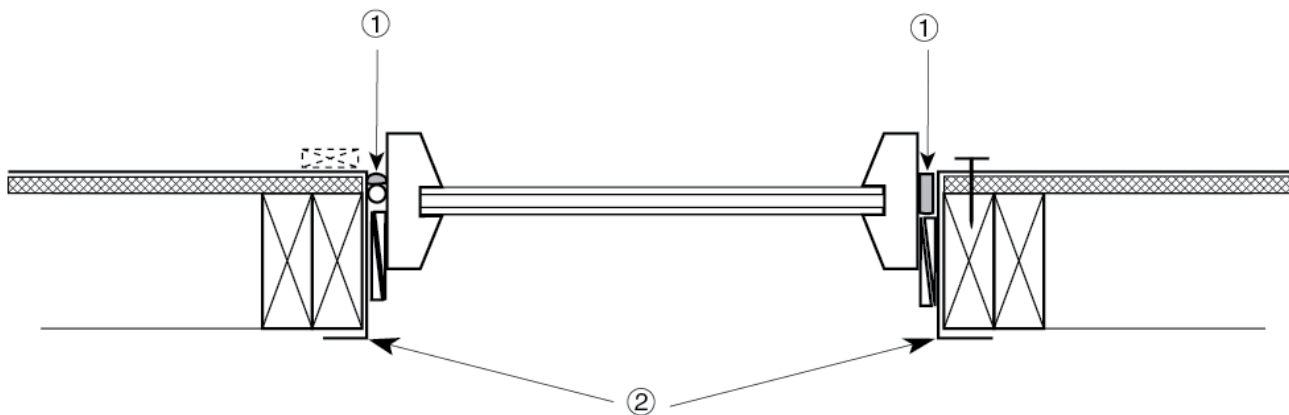


Figure 5. Window frame cross-section:

1. material is sealed to windows with sealant or foam that is compatible with “REX WRAP FORTIS (Air Barrier Material)” and wood/vinyl/aluminum frames
2. “REX WRAP FORTIS (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. Sealant must be compatible with the material and adhere to the framing material.

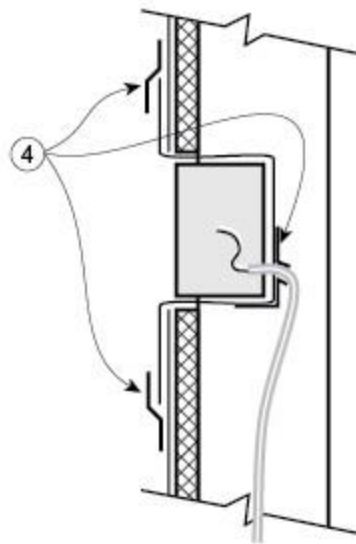
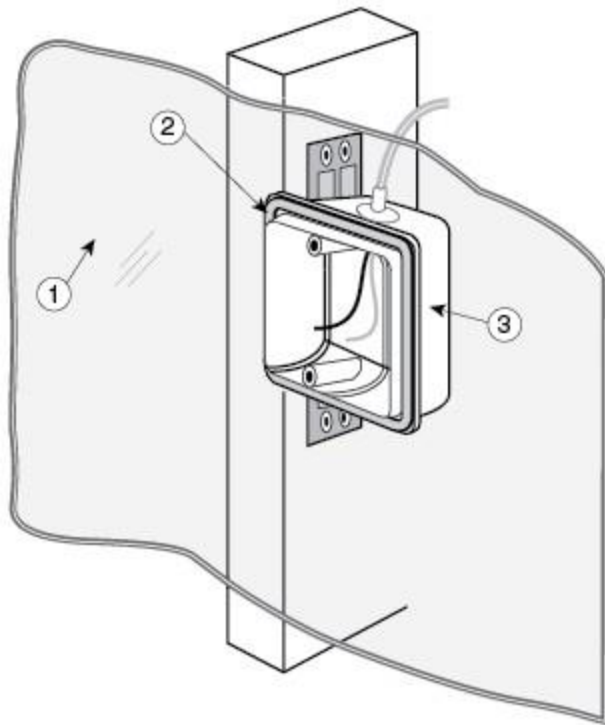


Figure 6. Exterior electrical boxes:

1. “REX WRAP FORTIS (Air Barrier Material)” installed on sheathing
2. snap-on retainer
3. airtight plastic box
4. tape seal

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.

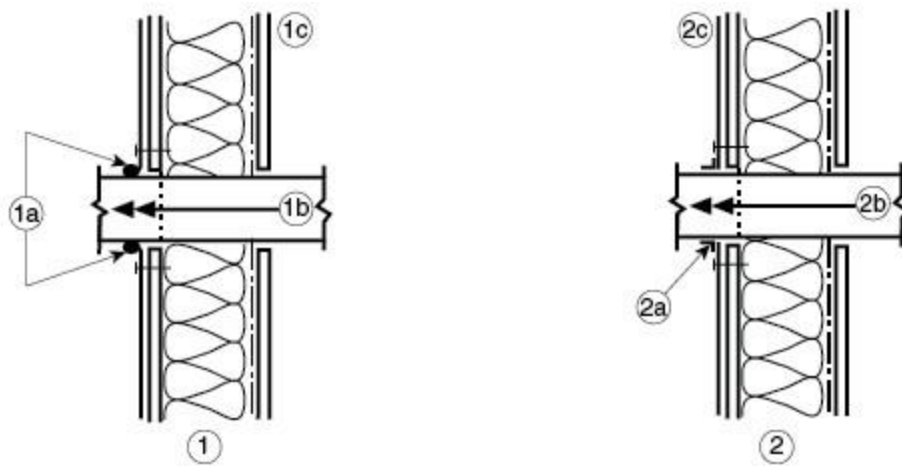


Figure 7. Sealing at wall penetrations:

- 1. Method 1:**
 - 1a. “REX WRAP FORTIS (Air Barrier Material)” is sealed around opening;**
 - 1b. direction of airflow exhaust; and**
 - 1c. inside of wall.**

- 2. Method 2:**
 - 2a. “REX WRAP FORTIS (Air Barrier Material)” is trimmed around opening and tape connection;**
 - 2b. direction of airflow exhaust; and**
 - 2c. outside of wall.**

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.