Evaluation Report CCMC 13120-R
Sto Guard® - Air Barrier Material

MASTERFORMAT:	07 27 09.02
Evaluation issued:	2003-05-26
Re-evaluated:	2012-11-26
Revised:	2013-08-13

1. Opinion

It is the opinion of the Canadian Construction Materials Centre (CCMC) that "Sto Guard® - 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

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

Ruling No. 12-01-271 (13120-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 2013-07-11 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

The product consists of three components within the Sto Corp.-specified "Sto Guard®" air barrier system: Sto Gold Fill®, Sto Guard® Mesh, and Sto Gold Coat®. This Report addresses the performance of Sto Gold Fill® as a component of the air barrier material within the Sto Corp.-specified "Sto Guard®" air barrier system. The actual air barrier system has not been evaluated but is presented in Appendix A of this Report as Additional Information for the convenience of building officials.

The product is a field-applied, two-component coating system intended to be applied over exterior sheathing having a low air permeance (≤ 0.02 L/(s·m^2)) as per Clause 5.4.1.2.(1)(a) and Article 9.25.3.2., which makes reference to the materials specified in Appendix A-9.25.5.(1) of Division B of the NBC 2010.

The product's coating system consists of two steps:

Step 1 - Sto Gold Fill® is sprayed or troweled into the panel joints and embedded with Sto Guard® Mesh, or Sto Guard® Mesh is applied to the panel joints first and Sto Gold Fill® is sprayed or troweled over it.

Step 2 - One or two coats of Sto Gold Coat® is applied over the entire surface by either spray or roller. Sto Gold Coat® must be applied to a thickness of 0.25 mm (10 mils) when wet using either method of application. Depending on the wall sheathing substrate, more than one coat may be necessary.

3. Conditions and Limitations

CCMC's compliance opinion in Section 1 is bound by the "Sto Guard® - Air Barrier Material" being used in accordance with the conditions and limitations set out below.

- When Sto Gold Fill® is installed at joints of approved low air permeance sheathing it must be protected from rain until the Sto Gold Coat® coats are dry (approximately four hours) and must be subsequently covered with insulation and an approved cladding.
- The amount of insulation installed over the "Sto Guard®" air barrier system must be in conformance with Table 9.25.5.2. of Division B of the NBC 2010.
- When foamed plastic insulation is installed as per Clause 9.27.3.4.(2)(b), Insulating Sheathing in lieu of Sheathing Membrane, of Division B of the NBC 2010, a sheathing membrane over the insulation is not required. Other insulations, however (i.e. fibrous), do require a sheathing membrane over the insulation. In the case of installation with EIFS cladding, the details specified in CCMC 12416-R for wood-based and non-wood-based substrates must be followed.
- When Sto Gold Fill® joint material is installed as part of the airtight element (i.e. sheathing) of the designated air barrier system, the designated vapour barrier (i.e. on the warm side of the assembly) need only generally comply with Article 9.25.4.2., Vapour Barrier Materials, of Division B of the NBC 2010. In addition, there are restrictions on installation where other low water vapour permeance and low air permeance elements have been installed in the wall assembly (i.e. outboard of the designated vapour barrier), whereby Subsection 9.25.5., Properties and Position of Materials in the Building Envelope, would apply.
- The product must be installed according to the insulated designs and penetration junction sealing details in Sto Corp.'s, "Air Barrier and Moisture Control Handbook S422," dated February 2003, or more recent updates at www.stocorp.com (examples of the installation details are presented as Additional Information in Appendix A of this Report).

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 4.1.1 Results of Testing Sto Gold Fill® to CCMC's Technical Guide for Air Barrier Materials

Test	Requirement	Result
Five 1 m^2 specimens with a 0.25-mm joint filler (on permeable substrate) were tested and measured for air permeance at a minimum of six air pressure differentials (ΔP) between 0 and 250 Pa.	Air leakage rate at 75 Pa ΔP (based on linear regression of 30 data points) $\leq$ 0.02 L/(s·m^2)	0.0014 L/(s·m^2)

Table 4.1.2 Results of Testing Water Vapour Permeance of Sto Gold Fill®

Test	Requirement	Result
ASTM E 96/E 96M-10 – Desiccant Method	Average of 3 specimens at the specified installed thickness – 0.25 mm (10 mils)	75 ng/Pa·s·m^2
ASTM E 96/E 96M – Desiccant Method	Average of 3 specimens at twice the specified installed thickness – 0.5 mm (20 mils)	48 ng/Pa·s·m^2

Report Holder

Sto Corp.
3800 Camp Creek Parkway
Bldg. 1400, Suite 120
Atlanta, GA 30331
U.S.A.

Telephone: 404-346-3666
Fax: 404-344-8421

Plant(s)

Atlanta, GA, U.S.A.

Disclaimer

Appendix A : Additional Information

An air barrier material as part of an air barrier system

CCMC has not evaluated the performance of the "Sto Guard®" air barrier system as to 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 when an air barrier system using this material is installed in conformance with the details outlined below and Sto Corp.'s "Air Barrier and Moisture Control Handbook," it should satisfy the requirements for continuity of the air barrier system in accordance with 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 this other 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 a coating is applied to the joints and to the opaque portion of the wall sheathing, as is the case with the "Sto Guard®" air barrier system, the coating is continuously supported by the substrate, however, the accessories (i.e. membranes and sealants) providing the continuity at penetrations against outward air pressure must also have adequate durability and strength to resist the anticipated pressures. CCMC's evaluation of the "Sto Guard® – Air Barrier Material" *does not include the durability and strength of the continuity details*. The AHJ must therefore determine whether the "Sto Guard®" air barrier system described herein meets the intent of Sentence 9.25.3.2.(1) of Division B of the NBC 2010 in that it is an effective barrier for the proposed construction in the proposed geographical/climate area. For example, based on their experience, the AHJ may deem the proposed "Sto Guard®" air barrier system as adequate for buildings in urban areas, sheltered sites, or areas of low wind, but inadequate in areas of high wind or exposed sites in rural or coastal areas.

The following is an air barrier system 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 "Sto Guard®" material is applied over wall sheathing specified as having low air permeance in accordance with Appendix Note A-9.25.5.1.(1). of Division B of 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. Sto Corp.'s "Air Barrier and Moisture Control Handbook" outlines how the product's materials and accessories must be joined to the foundation wall, windows and 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 the 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. Sto Gold Coat® material over low air permeance sheathing with joints filled with Sto Gold Fill®, which is embedded with Sto Detail or Sto Guard® Mesh, thus forming the principal material in the plane of airtightness;
ii. Accessories including Sto Corp.-specified rubberized asphalt membranes and sealants to maintain continuity at junctions with penetrations in the wall assembly (i.e. windows, doors, pipes, ducts, electrical outlets, etc.) and using continuity details outlined in the Sto Corp. "Air Barrier Installation and Moisture Handbook" or as provided at www.stocorp.com;
iii. Durability (when protected from moisture during curing and protected from UV after installation); and
iv. Exterior sheathing with the fasteners and fastening schedule specified in the NBC 2010, or as specified by a design professional for structural support against anticipated wind loads.

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

Figures 1 to 3 outline typical construction details of the installation of the "Sto Guard®" air barrier system in the field. See Sto Corp.'s "Air Barrier and Moisture Handbook, S422," dated February 2003, or the Sto Corp. web site for continuity details at all penetrations and junctions within the building envelope (i.e. sealing against windows, doors, pipes, ducts, airtight electrical boxes, etc.).

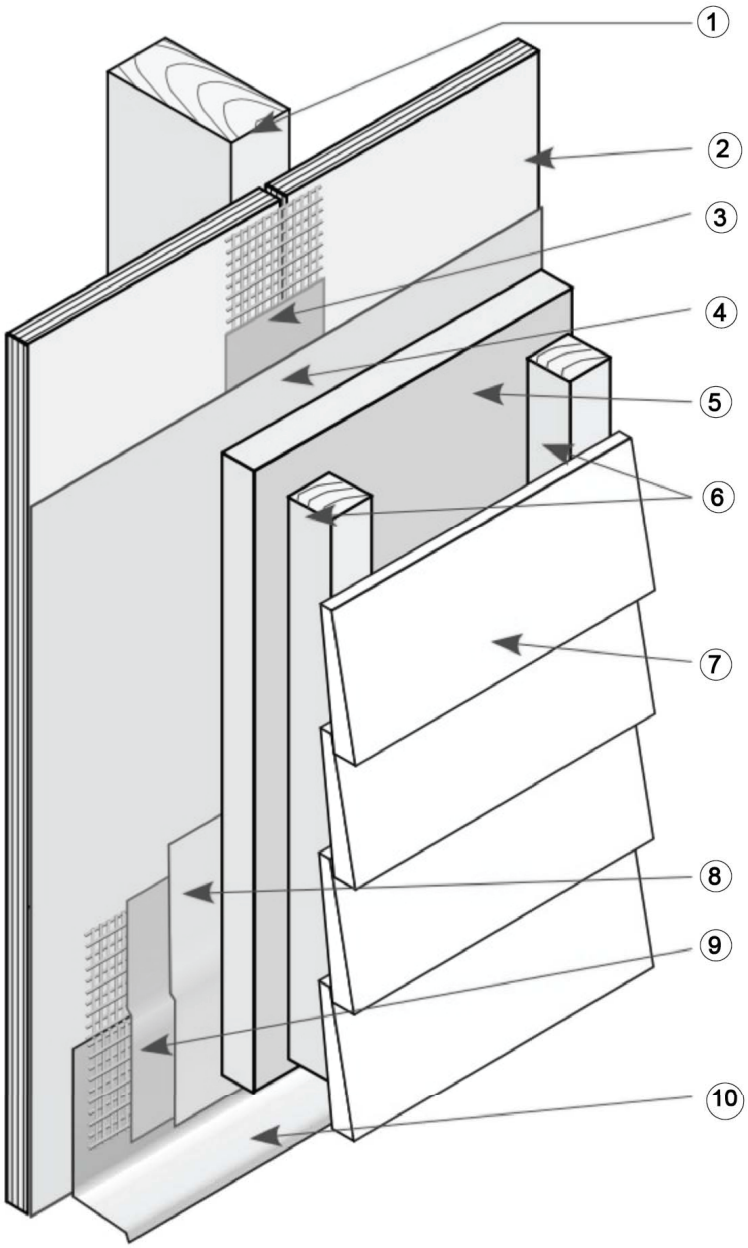

Figure 1. Typical installation of the product behind insulation and alternate claddings:

1. **supporting structure**
2. **substrate**
3. **Sto Gold Fill® with Sto Guard® Mesh**
4. **Sto Gold Coat®**
5. **insulation**
6. **strapping**
7. **horizontal siding**
8. **Sto Gold Coat®**
9. **Sto Gold Fill® with Sto Guard® Mesh**
10. **flashing**

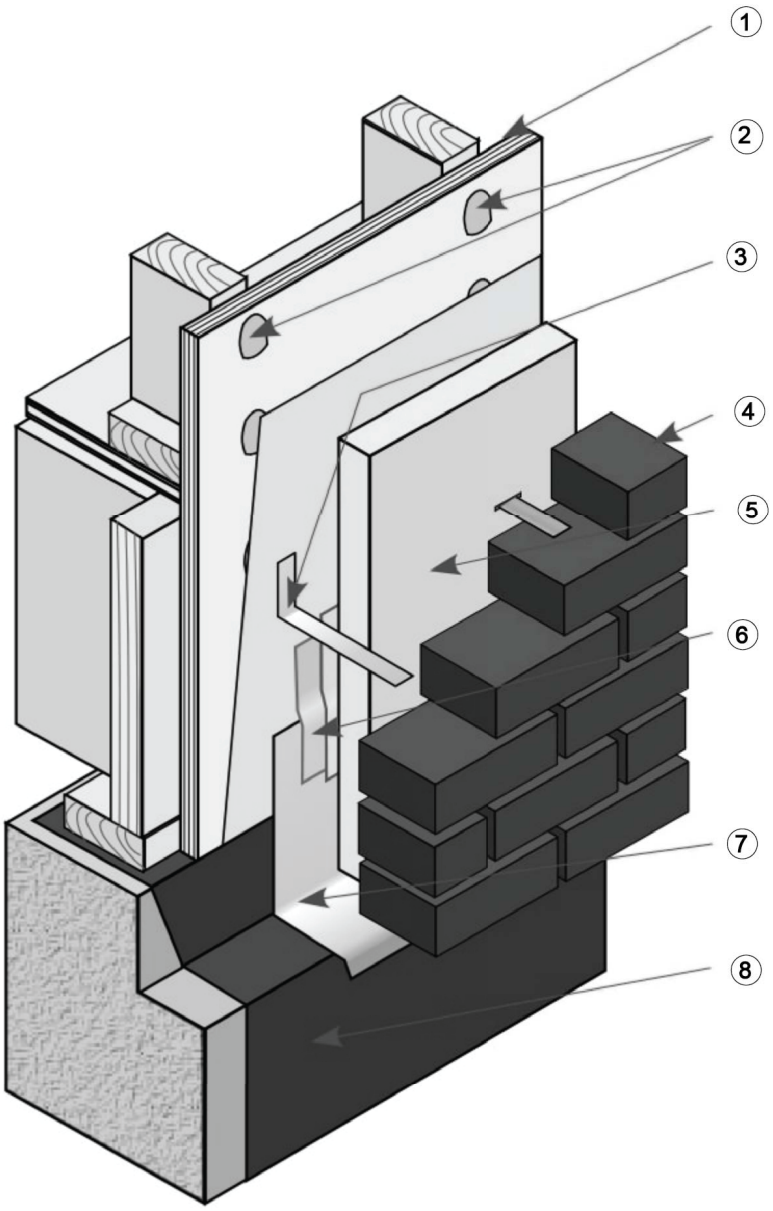

Figure 2. "Sto Guard®," continuity at foundation walls and typical insulation with brick veneer cladding:

1. **substrate**
2. **fasteners spotted with Sto Gold Fill®**
3. **masonry anchors fastened through Sto Guard®**
4. **brick**
5. **insulation**
6. **Sto Gold Fill® with Sto Guard® Mesh and Sto Gold Coat® lapped over flashing**
7. **through-wall flashing**
8. **foundation waterproofing**

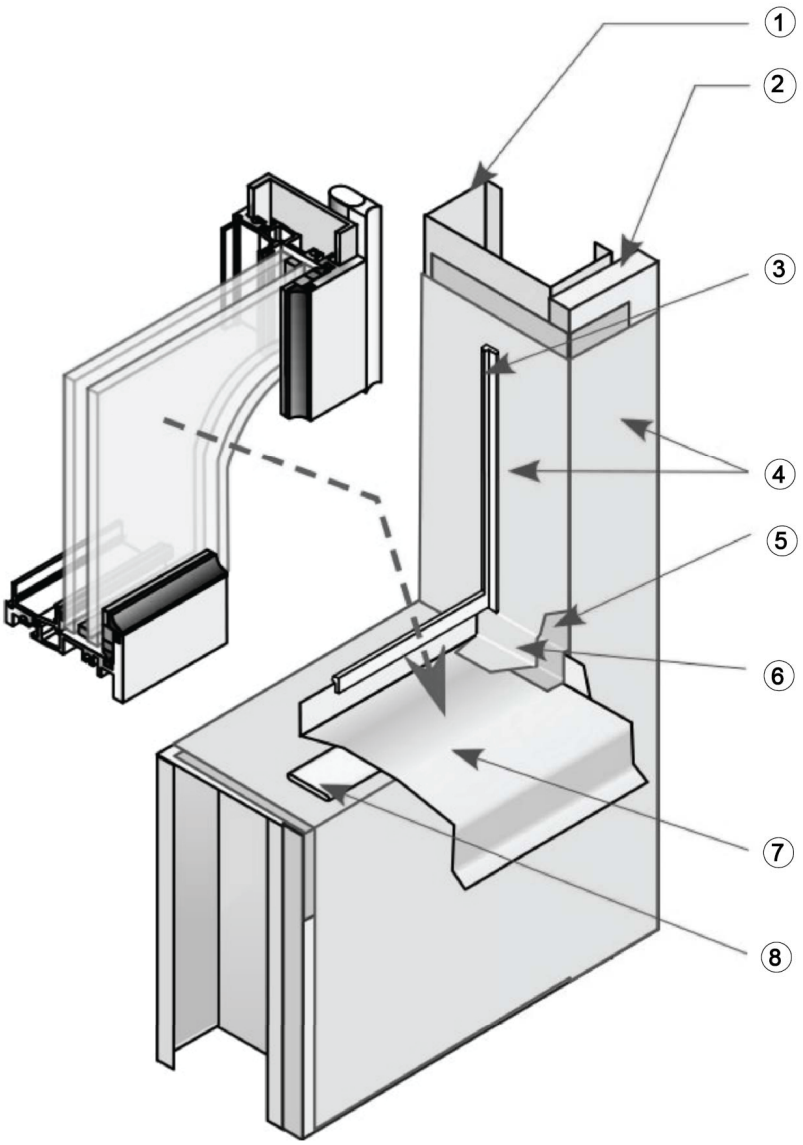

Figure 3. "Sto Guard®" exterior wall section – continuity at windows (NB: required insulation not shown):

1. **supporting structure**
2. **substrate**
3. **air seal continuous around interior perimeter of window**
4. **Sto Gold Fill®**
5. **Sto Gold Fill® and Sto Guard® Mesh**
6. **Sto Gold lapped over end dam of flashing to direct water to the exterior**
7. **pan flashing**
8. **sealant or other gasket material to maintain air seal between sill and flashing**

Date modified:
2013-08-15