NABA Process for Approval of Air Barrier Materials, Accessories and Assemblies

1.0 Overview

This document defines the requirements and outlines the process for a manufacturer to have air barrier products evaluated by NABA and when the product meets the requirements listed below, be included in NABA documents. This document provides the performance criteria for the product and submittal requirements set forth by NABA.

2.0 Objective

To provide a consistent, documented process for the NABA evaluation of air barrier materials, accessories and assemblies.

3.0 Definitions:

accredited laboratory:
testing laboratory that has been accredited to perform the test protocol for each test method including but not limited to CAN/ULC-S741/ASTM E2178 and CAN/ULC-S742/ASTM E2357. The accreditation organizations for laboratories are SCC (Standards Council of Canada), IAS (International Accreditation Service Inc) or the A2LA (American Association for Laboratory Accreditation.

air barrier accessory*:*
products designated to maintain air tightness between air barrier materials, air barrier assemblies and air barrier components, to fasten them to the structure of the building, or both (e.g., sealants, tapes, backer rods, transition membranes, nails/washers, ties, clips, staples, strapping, primers).

air barrier assembly
combination of air barrier materials and air barrier accessories that are designated and designed within the environmental separator to act as a continuous barrier to the movement of air through the environmental separator

air barrier component
pre-manufactured elements such as windows, doors and service elements that are installed in the environmental separator

air barrier manufacturer:
corporation which manufactures air barrier materials, accessories, components and / or assemblies. The manufacturer shall declare whether their product is a material, accessory or an assembly

air barrier material
building material with an air permeance not greater than 0.02 L/(s·m²) at 75 Pa that is designed and constructed to provide the primary resistance to airflow through an air barrier assembly

air barrier system
combination of air barrier assemblies and air barrier components, connected by air barrier accessories, that are designed to provide a continuous barrier to the movement of air through an environmental separator

air leakage rate
rate of airflow (L/s) driven through a unit surface area (m²) of an assembly by a unit static pressure difference (Pa) across the assembly (see also CAN/ULC-S742)

air permeance
rate of airflow (L/s) through a unit area (m²) of a material driven by unit static pressure difference (Pa) across the material (see also CAN/ULC-S741/ASTM E2178)

design service life
service life specified by the designer according to the expectations (or requirements) for the air barrier material (see also CSA-S478)

environmental separator
parts of a building that separate the controlled interior environment from the uncontrolled exterior environment, or that separate spaces within a building that have dissimilar environments

sprayed polyurethane foam (medium density closed cell)
rigid cellular plastic material that is formed in place by the catalyzed reaction of polymeric isocyanate and resin (which includes polyhydroxyl compounds, and blowing agents, etc.) producing a predominantly closed cell product that has a minimum density of 28 kg/m^3.

service life
period of time during which the air barrier assembly or any of its materials or accessories performs without unforeseen costs or disruption for maintenance or repair

4.0 Requirements for Evaluation of Air Barrier Materials

If a manufacturer has a current Air Barrier Association of America (ABAA) material listing, they will have an identical listing with NABA except for spray polyurethane foam (SPF) materials. Where the manufacturer does not have a listing with ABAA, the manufacturer shall provide test reports as outlined in Section 5.

For a new material listing, the manufacturer shall submit the following documentation to the NABA office for review.

4.1 Application Form

An application form shall be completed by the manufacturer for each material they declare meets the minimum requirements set by NABA for an air barrier product.

4.2 Air Barriers Materials – Testing Requirements

The air permeance testing shall be conducted by an *accredited laboratory* in accordance with the latest published edition of CAN/ULC-S741/ASTM E2178. All of the information required in the reporting section of the test method shall be included in the test report. The test report shall state that the test was conducted in accordance with the standard, unmodified.

The water vapor transmission testing shall be conducted by an *accredited laboratory*. All of the information required in the reporting section of the test method shall be included in the test report. The test report shall state that the test was conducted in accordance with the standard, unmodified.

The air leakage of air barrier assembly testing shall be conducted by an *accredited laboratory* in accordance with the latest published edition of CAN/ULC-S742/ASTM E2357. All of the information required in the reporting section of the test method shall be included in the test report. The test report shall state that the test was conducted in accordance with the standard, unmodified.

4.3 Air Permeance Testing

4.3.1 Fluid applied air barrier materials

a. Free film material testing

Fluid applied materials shall be tested at a measured thickness, in accordance with the manufacturer's product data sheet(s), installation instructions and/or master specification and fabricated in accordance with the manufacturer's field delivery requirements. The test report shall include the method of installation used for the evaluation. The air permeance testing shall be in accordance with CAN/ULC-S741/ASTM E2178 by installing the material on a release paper, then removing the release paper after installation in the test apparatus.

b. Sub-assembly testing

For products which cannot be tested in a "free film" state, instead of testing as a free film, the manufacturer shall test the material as part of a sub-assembly where the material shall be installed on a medium density CMU substrate and this sub assembly is tested. In cases of sub-assemblies, the air permeance of the CMU before installation of the air barrier material shall be reported. A copy of the test report stating what modifications were made to CAN/ULC-S741/ASTM E2178 for the purpose of conducting this test shall be provided with the application.

A successful test by using the particular installation method will result in the following NABA approval methods:

Installation Method	Installation Methods Approved
Spray	Spray, Roll, Trowel
Roll	Roll, Trowel
Trowel	Trowel

4.4 Material Specific Testing

The manufacturer shall conduct all of the tests in one of the tables of Clause 5.0 based on the table appropriate for their type of material. A copy of a test report from a manufacturer's internal laboratory or a third-party laboratory with all of the information required in the reporting section of the test method shall be submitted.

In cases where the manufacturer has a ABAA listing, the manufacturer shall provide ABAA a letter authorizing ABAA to release the information to NABA.

4.5 Supporting Documentation

The manufacturer shall provide the following documentation for each air barrier material:

i. Technical data sheet for the material
ii. Manufacturer guide/master specification for the material
iii. Typical construction details (if climate specific, this shall be indicated) which include the following as a minimum;
    1. roof/wall,
    2. wall/foundation,
    3. window/wall,
    4. expansion joint,
    5. change in plane,
    6. change in substrate,
    7. penetrations,
    8. inter-story connections,
    9. deflection joints,
    10. substrate joints, and
    11. defects

iv. Installation instructions that include information on;
    1. substrate preparation,
    2. required ambient and substrate conditions (e.g. temperature, wind, humidity, precipitation, falling temperature, etc.)
    3. application method (e.g. mechanically fastened, trowel on, roll on or spray on),
    4. sequence and technique for installation of *air barrier materials* to *air barrier accessories* as tested in the CAN/ULC-S742/ASTM E2357 testing,
    5. material compatibility listing,
    6. listing of approved primers and sealants,
    7. chemical resistance to potential adjoining materials
    8. for liquid-applied membranes - minimum and maximum installation thickness (as fabricated by the manufacturers field delivery system), including thicknesses for application on concrete block, solids by weight, coverage rate and drying time.

v. A list of substrates that the material can be installed on and specifically list any substrate where the manufacturer does not recommend their material be installed upon,

vi. Service temperature of installed material,

vii. Declared VOC content in g/l and test method,

viii. Material Safety Data Sheet,

ix. Maximum allowed UV exposure, and

x. Manufacturers logo electronically in vector format (.eps or .ai)

4.6 Submission of Product Samples

The manufacturer will submit three cured material samples, minimum size of 400 square cen.

5.0 Required Tests by Air Barrier Material Type

Complete all of the tests listed in one of the tables below.

5.1 Self-Adhered Membranes

Product Property	Test Standard	Test Standard Title	UNIT	Requirements	
				Min	Max
Air Permeance	CAN/ULC-S741-08 / ASTM E2178-11	Standard for Air Barrier Materials – Specification / Standard Test Method for Air Permeance of Building Materials	L/(s·m²) at a pressure differential of 75 Pa	-	0.02
Resistance to Puncture (reduce damage)	ASTM E154-08a	Standard Test Methods for Water Vapor Retarders Used in Contact with Under Concrete Slabs, on Walls or as Ground Cover - Section 10 only	(N)	(178)	-
Tensile Strength	ASTM D882-12	Standard Test Method for Tensile Properties of Thin Plastic Sheeting	(N/mm)	(3.5 or until substrate failure)	-
Water Resistance	AATCC 127 - 2008	Water Resistance: Hydrostatic Pressure Test for 5 hours	(cm)	(55)	-
Peel or Stripping Strength of Adhesive Bonds	ASTM D903-98 (2004)	Standard Test Method for Peel or Stripping Strength of Adhesive Bonds - *Specify substrates and surface preparation for glass fiber faced gypsum sheathing and concrete block. Declare failure mode.*	(N/mm)	(0.875)	-
Lap Adhesion	ASTM D1876-08	Standard Test Method for Peel Resistance of Adhesives (T peel test) – *Specify Substrates and surface preparation for glass fiber faced gypsum sheathing and/or concrete block. Declare failure mode.*	(N/mm)	(0.875)	-
Low Temperature Flexibility	ASTM D1970 / D1970M - 11	Standard Specification for Self-Adhering Polymer Modified Bituminous Sheet Materials Used as Steep Roofing Underlayment for Ice Dam Protection – Section 7.6 Low Temperature Flexibility	(-30°C)	Pass	-
Self Sealability	ASTM D1970 / D1970M - 11	Standard Specification for Self-Adhering Polymer Modified Bituminous Sheet Materials Used as Steep Roofing Underlayment for Ice Dam Protection – Section 8.9 Nail Sealability	-	Pass or specify sealing detail around fasteners	-
Pull Adhesion	ASTM D4541-09e1	Modified Version of Standard Test Method for Pull-Off Adhesion Strength of Coatings on Concrete using Portable Pull-Off Adhesion Testers *Specify substrates and surface preparation for glass fiber faced gypsum sheathing and concrete block. Declare failure mode*	kPa	110 or report value at substrate failure	-
Tear Initiation and Tear Propagation	ASTM D4073-06	Standard Test Method for Tensile-Tear Strength of Bituminous Roofing Membrane Machine direction / cross direction	N	40	-
Crack Bridging	ASTM C1305-08	Standard Test Method for Crack Bridging Ability of Liquid Applied Waterproofing Membrane	-26°C	Pass	-
Water Vapor Permeance	ASTM E96/E96M-10 (Desiccant and Water Methods)	Standard Test Methods for Water Vapor Transmission of Materials	(ng/(Pa·s·m²))	Declare	

5.2 Fluid Applied Membranes

All testing shall be conducted with the applied liquid material within the minimum / maximum range. The specific thickness of the material which was used when conducting the following tests shall be recorded on the test report and shall be the site installed thickness.

Product Property	Test Standard	Test Standard Title	Unit	Requirement	
				Min	Max
Air Permeance	CAN/ULC-S741-08 / ASTM E2178-11	Standard for Air Barrier Materials – Specification / Standard Test Method for Air Permeance of Building Materials	L/(s·m²) at a pressure differential of 75 Pa	-	0.02
Water Resistance	AATCC 127 - 2008	Water Resistance: Hydrostatic Pressure Test for 5 h	cm	55	-
Self Sealability	ASTM D1970 / D1970M - 11	Standard Specification for Self-Adhering Polymer Modified Bituminous Sheet Materials Used as Steep Roofing Underlayment for Ice Dam Protection - Section 8.9 Nail Sealability	-	Pass or specify sealing detail around fasteners	-
Pull Adhesion	ASTM D4541-09e1	Modified Version of Standard Test Method for Pull-Off Adhesion Strength of Coatings on Concrete using Portable Pull-Off Adhesion Testers– Specify substrates and surface preparation for glass fiber faced gypsum sheathing and concrete block. Declare failure mode.	(kPa)	(110) or report value at substrate failure	-
Crack Bridging	ASTM C1305-08	Standard Test Method for Crack Bridging Ability of Liquid Applied Waterproofing Membrane– Report thickness and joint treatment (158° for 2 weeks)	-	Pass	-
Water Vapor Permeance (at applied thickness)	ASTM E96/E96M-10 (Desiccant and Water Methods)	Standard Test Methods for Water Vapor Transmission of Materials	(ng/(Pa·s·m²))	Declare	

5.3 Sprayed Polyurethane Foam (Medium Density Closed Cell)

Rigid cellular plastic material that is formed in place by the catalyzed reaction of polymeric isocyanate and resin (which includes polyhydroxyl compounds, and blowing agents, etc.) producing a predominantly closed cell product that has a minimum density of 28 kg/m^3.

All testing shall be conducted with the applied liquid material within the minimum / maximum range. The specific thickness of the material which was used when conducting the following tests shall be recorded on the test report:

Product Property	Test Standard	Test Standard Title	Unit	Requirement	
				Min	Max
Standard Specification	CAN/ULC-S705.1	Standard for Thermal Insulation – Spray Applied Rigid Polyurethane Foam, Medium Density – Material – Specification	-	As defined by standard	

5.4 Mechanically Fastened Commercial Building Wraps

Product Property	Test Standard	Test Standard Title	Unit	Requirement	
				Min	Max
Air Permeance	CAN/ULC-S741-08 / ASTM E2178-11	Standard for Air Barrier Materials – Specification / Standard Test Method for Air Permeance of Building Materials	L/(s·m²) at a pressure differential of 75 Pa	-	0.02
Standard Specification	ASTM E2556 / E2556M - 10	Standard Specification for Vapor Permeable Flexible Sheet Water-Resistive Barriers Intended for Mechanical Attachment	-	As defined by standard	

5.5 Boardstock Air Barrier – Rigid Cellular Thermal Insulation Board

Product Property	Test Standard	Material Type	Test Standard Title	Unit	Requirement	
					Min.	Max.
Standard Specification	ASTM C1289-12e1	Polyisocyanurate	Standard Specification for Faced Rigid Cellular Polyisocyanurate Thermal Insulation Board	-	As defined by standard	
	OR					
	ASTM C578-12a	Polystyrene	Standard Specification for Rigid, Cellular Polystyrene Thermal Insulation	-	As defined by standard	
Air Permeance	CAN/ULC-S741-08 / ASTM E2178-11	All	Standard for Air Barrier Materials – Specification / Standard Test Method for Air Permeance of Building Materials	L/(s·m²) at a pressure differential of 75 Pa	-	0.02

5.5.1 Boardstock Classification

The Product Type in ASTM C1289 or Classification in ASTM C578 of the boardstock being tested shall be listed in the test reports.

6.0 Air Barrier Assembly Testing

The material being evaluated shall be incorporated and tested as part of an *air barrier assembly* in conformance with CAN/ULC-S742 / ASTM E2357 by an *accredited laboratory.* A **complete** test report shall be submitted to NABA for review.

The conditioning within CAN/ULC-S742 / ASTM E2357 provides information that the materials and accessories perform under the loads imposed.

Product Property	Test Standard	Test Standard Title	Requirement
Assembly Air Leakage	CAN/ULC-S742-11 / ASTM E2357-11	Standard for Air Barrier Assemblies – Specification / Standard Test Method for Determining Air Leakage of Air Barrier Assemblies	0.20 L/(s·m²) at a pressure differential of 75 Pa when tested in both directions

6.1 Specimen Preparation

Installation instructions for the *air barrier assembly* shall be provided to the *accredited laboratory* by the *air barrier manufacturer* for the materials to be installed on the test assembly to prepare the specimen for CAN/ULC-S742 / ASTM E2357 testing in conformance with the standard.

If there are no installation instructions provided to the *accredited laboratory*, the following details of the installation of the *air barrier materials* and the *air barrier accessories* shall be documented and included in the test report:

i. Installation details shall include information on:
   1. substrate
   2. substrate preparation,
   3. required ambient and substrate conditions (e.g. temperature, wind, humidity, precipitation, falling temperature, etc.),
   4. installation method (e.g. mechanically fastened, trowel on, roll on or spray on),
   5. sequence and technique for installation,
   6. material compatibility listing,
   7. listing of approved primers and sealants,
   8. chemical compatibility,
   9. for fluid-applied membranes - minimum and maximum installation thickness (as fabricated by the manufacturers field delivery system), including thicknesses for application on concrete block, solids by weight, coverage rate and drying time, and

10. submit a copy of approved details for the assembly

7.0 Review Process

All submittal documentation, when received will be reviewed from the NABA checklist for an application compliance aspect and administratively. The NABA office will correspond with the manufacturer in regards to clarification or missing items.

Upon receipt of the full submittal information has been received, it will be documented and organized for Technical Review Committee will provide a review of the documentation submitted and provide comments in an itemized checklist.

The Technical completeness and consistency review will consist of the following:

a. Review of test data reports as per the requirements of the standard
b. Review of specifications, installation instructions and product limitations

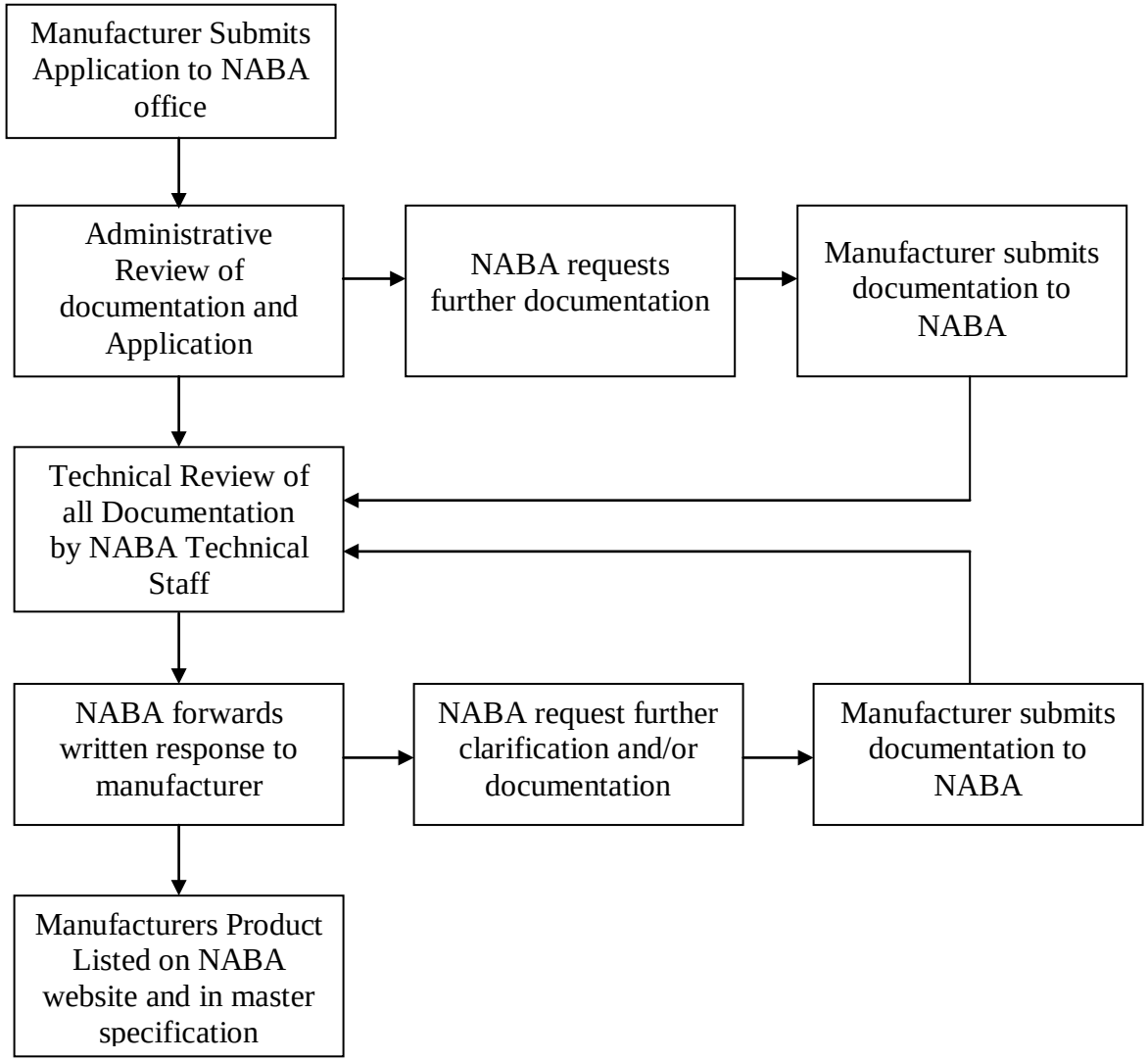
Once the technical review has been completed, an itemized checklist with comments will be forwarded to the NABA office outlining approval, disapproval or requests for further information or clarification from the manufacturer.

The NABA office will then forward a written response by email to the manufacturer

At which time all of the outstanding documentation is received by NABA, a final review will be conducted to ensure all information has been submitted and test reports comply with the applicable standard.

Once NABA has deemed all information to have been submitted as per this document, the material will be placed on the NABA website and in the appropriate master specification within 48 business hours.

7.1 Flow Chart- NABA Process for Evaluation of Air Barrier Materials, Accessories and Assemblies



8.0 Manufacturer Evaluation

Once a manufacturer has gone through the process of having a material, component or assembly listed with NABA, they would be required to sign and licensing agreement that would formalize their requirements to maintain their license.

By being a licensed manufacturer, the manufacturer would be able to promote themselves as such.

On-going maintenance of the licensing would be outlined in their licensing agreement which would include such items as:

a. Maintaining professionalism
b. Submission of test results and documentation when product changes occur.
c. Interval audit every three years that would review manufacturers documentation
d. and compliance to the license agreement

The renewal of the license would occur on a yearly basis which may include the following:

a. payment of fees
b. Declaration / confirmation of air barrier materials, components or assemblies.