

ABAA Process for Approval of Air Barrier Materials, Components and Assemblies

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(ABAA-10001-2.1)

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

2.0 Objective: To provide a consistent, documented process for ABAA evaluation of air barrier materials, components 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 ASTM E 2178 and ASTM E 2357. The accreditation organizations for laboratories are IAS (International Accreditation Service Inc), A2LA (American Association for Laboratory Accreditation) or SCC (Standards Council of Canada).

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, components and / or assemblies. The manufacturer shall declare whether their product is a material, a component 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 ASTM E 2357)

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 ASTM E 2178)

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

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

4.1 **Manufacturer Submission of Documentation**

The manufacturer shall submit the following documentation to the ABAA office for review.

4.1.1 Application Form: A separate application form shall be completed by the manufacturer for each material they declare meets the minimum requirements set by ABAA for an air barrier material.

4.1.2 **Test Result:**

4.1.2.1 **All air barriers materials except fluid applied**

The air permeance testing shall be conducted by an *accredited laboratory* in accordance with the latest published edition of ASTM E 2178. A copy of the test report stating the test was conducted to ASTM E 2178 without being modified shall be provided with the application.

4.1.2.2 **Fluid applied air barrier materials**

a. **Free film material testing**

Fluid applied membranes shall be tested at a measured minimum thickness, in accordance with the manufacturer's product data sheet(s) 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 ASTM E 2178 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 ASTM E 2178 for the purpose of conducting this test shall be provided with the application.

A successful test by using a particular application method will result in the following:

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

4.1.2.3 Test Report

A copy of the test report containing the following information shall be provided with the application.

- Name and location of laboratory performing the tests and the accreditation agency for the laboratory;
- Date test conducted;
- Manufacturer's name, address, production facility address and product designation;
- Type and name of the material and other material description including basis weight (if applicable);
- Lot number and manufactured date;
- Material sampling procedure used;
- Description of the specimen preparation;
- Size of specimens used for each test (length, width and thickness);
- Statement specifically stating that the material has not been applied to any substrate or a statement describing the substrate and method of installation;
- In the event that a substrate is used, the air permeance of the substrate as measured using this test method before the installation of the material;
- Tare of the test apparatus;
- Measured air flow versus pressure difference data in graphic form (log/log graph) for the specimens. The air permeance rate at the reference pressure difference, ΔP , of 75 Pa shall be identified on the graph;
- Calculated air permeance versus the pressure difference in tabular form;
- Error analysis as described in Clause 9.4 of ASTM E 2178;
- Declaration of conformity with this standard or a detailed description of the modifications

- 4.1.3 Supporting Documentation:** The manufacturer shall provide the following documentation for each product and accessory:
- i. Technical data sheet for the product
 - ii. Tested thickness for their material.
 - iii. Manufacturer guide specification for the product
 - iv. 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, and
 8. inter-story connections and deflection joints
 9. substrate joints and defects.
 - v. 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,
 5. material compatibility listing,
 6. listing of approved primers and sealants,
 7. chemical resistance.
 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.
 - vi. A list of substrates that the material can be installed on and specifically list any material where the manufacturer does not recommend their material be installed upon.
 - vii. Service temperature of installed product
 - viii. Marketing material for the product
 - ix. Declared VOC content in g/l and test method
 - x. Material Safety Data Sheet
 - xi. Maximum allowed UV exposure
 - xii. Test report for material tested in accordance with ASTM E-96 including method used.

4.1.4 Submission of Product Samples: The manufacturer will submit three cured material samples, minimum size of 120 square inches.

4.1.5 Product Specific Testing

4.1.5.1 Self-Adhered Sheet Air Barriers

Product Property	Test Standard	Test Standard Title	UNIT	Requirements	
				Min	Max
Air Permeance	ASTM E 2178-03	Standard Test Method for Air Permeance of Building Materials	L/(s·m ²) at a pressure difference of 75 Pa	-	0.02 L/(s·m ²) (0.004 cfm/ft ² at a pressure difference of 1.56 lb/ft ²)
Resistance to Puncture (reduce damage)	ASTM E 154-99	Standard Test Methods for Water Vapor Retarders Used in Contact with Under Concrete Slabs, on Walls or as Ground Cover - Section 10 only	N	178N (40 lbs-force)	-
Tensile Strength	ASTM D 882	Standard Test Method for Tensile Properties of Thin Plastic Sheeting	N/mm	3.5	-
Water Resistance	AATCC 127 - 03	Water Resistance: Hydrostatic Pressure Test for 5 hours	cm	55cm 21.65 in	-
Peel or Stripping Strength of Adhesive Bonds	ASTM D 903-98	Standard Test Method for Peel or Stripping Strength of Adhesive Bonds - <i>Specify substrates and surface preparation for glass fiber faced gypsum sheathing andr concrete block. Declare failure mode.</i>	N/mm	0.875N/cm or until substrate failure (0.1967pli)	-
Lap Adhesion	ASTM D 1876-04	Standard Test Method for Peel Resistance of Adhesives (T peel test) – <i>Specify Substrates and surface preparation for glass fiber faced gypsum sheathing and/or concrete block. Declare failure mode.</i>	N/mm	0.875N or until substrate failure (0.1967pli)	-
Low Temperature Flexibility	ASTM D 1970-01	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	-20°F (-30°C)	Pass	-
Nail Sealability	ASTM D 1970-01	Standard Specification for Self-Adhering Polymer Modified Bituminous Sheet Materials Used as Steep Roofing Underlayment for Ice Dam Protection – Section 7.9 Nail Sealability	-	Pass	-
Pull Adhesion	ASTM D 4541-05	Modified Version of Standard Test Method for Pull-Off Adhesion Strength of Coatings on Concrete using Portable Pull-Off Adhesion Testers <i>Specify substrates and surface preparation for glass fiber faced gypsum sheathing and concrete block. Declare failure mode</i>	kPa	110kPa or report value at substrate failure 15.95 psi	-
Tear Initiation and Tear Propagation	ASTM D 4073	Standard Test Method for Tensile-Tear Strength of Bituminous Roofing Membrane	N Machine direction / cross direction	40	-
Crack Bridging	ASTM C 1305	Standard Test Method for Crack Bridging Ability of Liquid Applied Waterproofing Membrane	-26°C (-15°F)	Pass	-
Water Vapor Permeance	ASTM E 96-00e1	Standard Test Methods for Water Vapor Transmission of Materials (<i>Desiccant and Water Method</i>)	Ng/(Pa·s·m ²)	Declare	

4.1.5.2 Liquid 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.

The manufacturer shall submit the following additional test reports.

Product Property	Test Standard	Test Standard Title	Unit	Requirement	
				Min	Max
Air Permeance	ASTM E 2178-03	Standard Test Method for Air Permeance of Building Materials	L/(s·m ²) at a pressure difference of 75 Pa	-	0.02 L/(s·m ²) (0.004 cfm/ft ² at a pressure difference of 1.56 lb/ft ²)
Water Resistance	AATCC 127 - 03	Water Resistance: Hydrostatic Pressure Test for 5 h	cm	55	
Fastener Sealability	ASTM D 1970-01	Standard Specification for Self-Adhering Polymer Modified Bituminous Sheet Materials Used as Steep Roofing Underlayment for Ice Dam Protection - Section 7.9 Nail Sealability	-	Pass or specify sealing detail around fasteners	-
Pull Adhesion	ASTM D 4541-05	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 force at substrate failure	-
Crack Bridging	ES-AC 212	Acceptance Criteria for Water-Resistive Coatings used as Water-Resistive Barriers over Exterior Sheeting	-	Pass	-
	OR ASTM C 1305	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 E 96-00e1	Standard Test Methods for Water Vapor Transmission of Materials (<i>Water and Desiccant Method</i>)	Ng/(Pa·s·m ²)	Declare	

4.1.5.3 Sprayed Polyurethane Foam (Medium Density Closed Cell)

The manufacture shall declare the minimum or maximum thickness allowed for their liquid applied air barrier material.

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
Air Permeance	ASTM E 2178-03	Standard Test Method for Air Permeance of Building Materials	L/(s·m ²) at a pressure difference of 75 Pa	-	0.02 L/(s·m ²) (0.004 cfm/ft ² at a pressure difference of 1.56 lb/ft ²)
Flame Spread Characteristics	ASTM E84-05	Standard Test Method for Surface Burning Characteristics of Building Materials	-	-	75
Water Vapor Transmission	ASTM E-96-00e1	Standard Test Methods for Water Vapor Transmission of Materials – Water and Desiccant Method	ng/(Pa·s·m ²)	Declaration of thickness at which material meets 1 perm	-
Thermal Transmission	ASTM C-177-04 or C518-	Standard Test Method for Steady-State Heat Flux Measurements and Thermal Transmission Properties by Means of the Guarded-Hot-Plate Apparatus	m ² ·°C/W	Report	-
Compressive Strength	ASTM D-1621-04a	Standard test method for Compressive Properties of Rigid Cellular Plastics	kPa	104	-
Density	ASTM D-1622-03	Standard Test Method for Apparent Density of Rigid Cellular Plastics	kg/m ³	24	-
Tensile Strength	ASTM D-1623-03	Standard Test Method for tensile and Tensile Adhesive Properties of Rigid Cellular Plastics	kPa	138	-
Dimensional Stability	ASTM D-2126-04	Standard Test Method for response of Rigid Cellular Plastics to Thermal and humid Aging -20°C 80°C 70°C, 97% ±3 % R.H.	%	- - -	-4 +8 +15
Water Absorption	ASTM D-2842-01	Standard test method for Water Absorption of Rigid Cellular Plastics	%	-	4
Open Cell Content	ASTM D-2856-94	Standard test Method for Open-Cell Content of Rigid Cellular Plastics by the Air Pycnometer	%	-	10
Pull Adhesion	ASTM D-4541-02	Standard Test Method for Pull-Off Strength of Coatings Using Portable Adhesion testers	kPa	110 or report force at concrete densglass	-
Crack Bridging	ASTM C 1305	Standard Test Method for Crack Bridging Ability of Liquid Applied Waterproofing Membrane	-15°F (-26°C)	Pass	-

4.1.5.4 Mechanically Fastened Commercial Building Wraps

Product Property	Specimen Type	Material type	Test Standard	Test Standard Title	Unit	Requirement		
						Min	Max	
Air Permeance	As received	All materials	ASTM E 2178	Standard Test Method for Air Permeance of Building Materials	L/(s.m ²) at a pressure difference of 75 Pa	-	0.02 L(s.m ²) (0.004 cfm/ft ² at a pressure difference of 1.56 lb/ft ²)	
Dry Tensile Strength or Dry Breaking Force	As received	Paper and felt based	ASTM D 828	Standard Test Method For Tensile Properties of Paper and Paperboard Using Constant-Rate-of-Elongation Apparatus	Machine direction / cross direction N/mm (lbs force per inch)	3.5 (20)	-	
		Polymeric based	ASTM D 882	Standard Test Method For Tensile Properties of Thin Plastic Sheeting	Machine direction / cross direction N/mm (lbs force per inch)	3.5 (20)	-	
			or ASTM D 5034	Standard Test Method For Breaking Strength and Elongation of Textile Fabrics (Grab Test)	N Machine direction Cross direction (lbs force)	176 156 cross direction 40 machine/35 cross direction		
Water Vapor Permeance	As received	All materials	ASTM E 96,	Standard Test Methods For Water Vapor Transmission of Materials Desiccant or Water Method	Ng/(Pa.s.m ²) (Perms)	300 (5)		
Pliability	As received	All materials	ICC-ES AC38, Section 3.3.4	Acceptance Criteria For Water-Resistive Barriers-the material does not crack when bent over a 1.6 mm (1/16 inch) diameter mandrel at a temperature of 0°C (32°F)	-	Pass		
						Type 1	Type 2	
Water Resistance	As received and	Paper, felt or	ASTM D 779	Standard Test Method For Water Resistance of Paper, Paperboard and Other Sheet Materials By	m	10	60	-

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	weathered	polymeric based		The Dry Indicator Method				
		Polymeric based	AATCC-127 Or	Water Resistance: Hydrostatic Pressure Test no leakage under specimen with 55 cm hydrostatic head in 5 h	-		Pass	-
			CCMC 07102, Section 6.4.5	Water Ponding no leakage in 2 h	-	Pass	-	-

NOTE: For water resistive barriers which are not designed to be air barriers, the water resistive barrier shall meet all of the requirements in the table above without the requirement for air permeance.

Step 2: Review Process

All submittal documentation, when received will be reviewed from the ABAA checklist for an application compliance aspect and administratively. The ABAA 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
- b. Review of details
- c. 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 ABAA office outlining approval, disapproval or requests for further information or clarification from the manufacturer.

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

Timelines Minimum Processing Time – 14 weeks

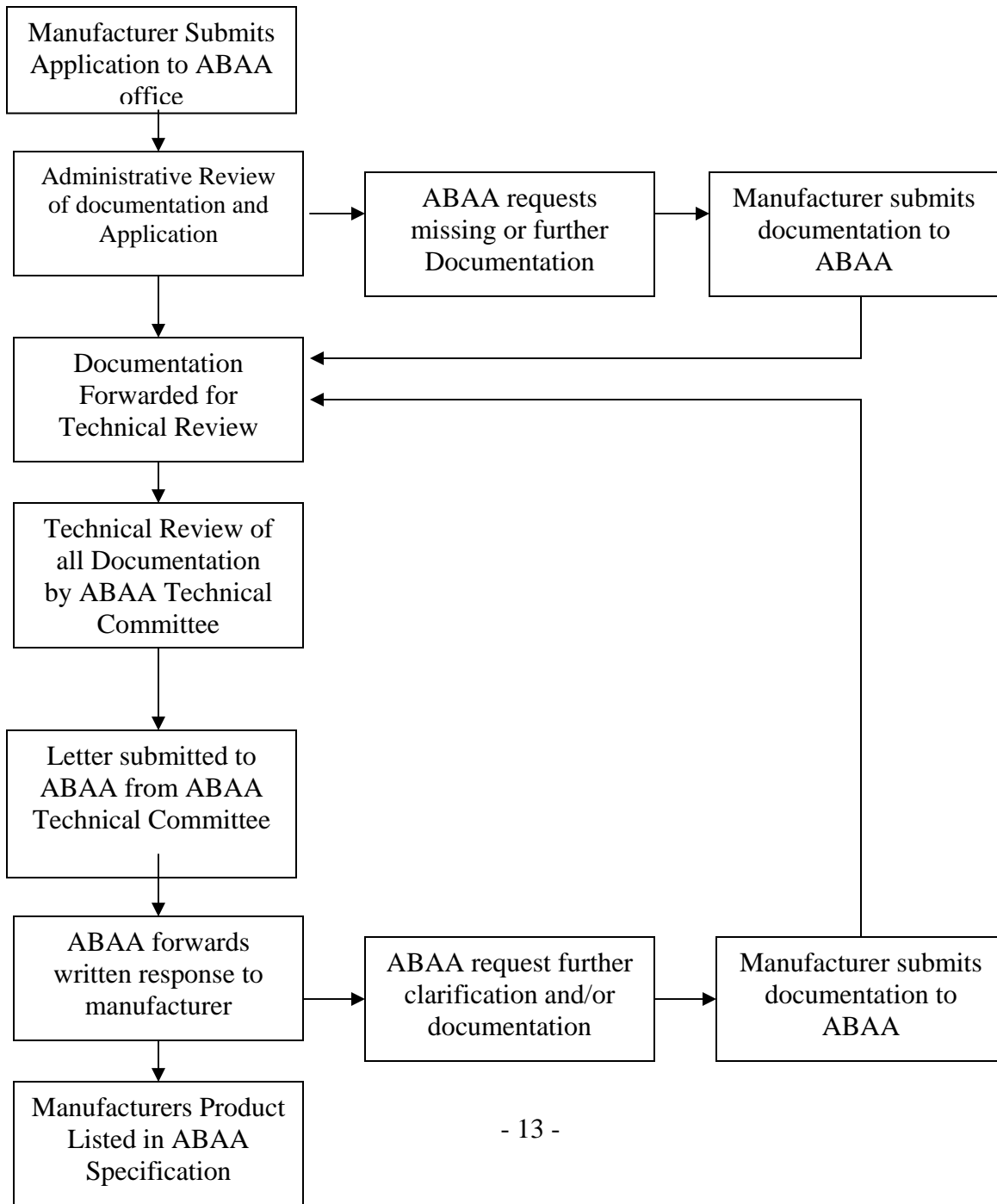
From date of receipt of materials, an initial completeness / submittal checklist will be completed within 3 weeks of the receipt of the final documentation required..

If not further information is required, the a technical review would be completed by the ABAA Technical Review Board in three weeks.

The completeness and consistency review by the ABAA Technical Review Board shall be completed within ten weeks from the date of receipt from the ABAA office.

A written response by ABAA will be submitted to the manufacturer within one week of receiving the report from the ABAA Technical Review Board.

Flow Chart- ABAA Process for Evaluation of Air Barrier Materials, Components and Assemblies



Requirements for listing of Air Barrier Components

The same procedure would be followed for air barrier components as was followed with the listing process of air barrier materials.

Requirements for listing of Air Barrier Assembly (Optional until 2010)

Air Leakage *	ASTM E 2357	Standard Test Method for Determining Air Leakage of Air Barrier Assemblies	-	Not greater than 0.20 L/(s·m ²) tested in both directions
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The manufacturer may apply to have his assembly listed with ABAA (optional). SUCH LISTING AS AN AIR BARRIER ASSEMBLY IS NOT REQUIRED AS A CONDITION FOR A LISTING OF AN AIR BARRIER MATERIAL OR COMPONENT. The manufacturer shall be required to have a current listing of the air barrier material already evaluated by ABAA. The manufacturer may then use this material in an air barrier assembly and provide ABAA with the following information: The manufacturer is not required to have a air barrier assembly listing to be able to have a air barrier material or component listing.

- a. Submit Application for Air Barrier Assembly Listing
- b. Submit declaration of materials and components used in assembly
- c. Submit test results following the protocol for air barrier materials and components for all products used in the air barrier assembly
- d. Submit test results from an accredited laboratory in regards to the ASTM E 2357 Air Barrier Assembly Standard
- e. Submit a copy of the specification for the air barrier assembly
- f. Submit a copy of the detailed installation instructions
- g. Submit a copy of approved details for the assembly

The listing process of the air barrier assembly will follow the same flow, timelines and processes as identified for the listing of air barrier materials.

Manufacturer Evaluation

Once a manufacturer has gone through the process of having a material, component or assembly listed with ABAA, 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 3 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.