

Technical Note 8

Testing and Inspection of Air Barrier Materials, Assemblies and Installations

Abstract: This Technical Note addresses considerations for testing air barrier materials, assemblies and installations.

Testing of Air Barrier Materials

The laboratory testing requirements for air barrier materials are listed in Technical Note 2. Additional laboratory testing for properties to be used in assessing the suitability of an air barrier material for use on a project are as follows:

ASTM D6886 Standard Test Method for Determination of the Weight Percent Individual Volatile Organic Compounds in Waterborne Air-Dry Coatings by Gas Chromatography

ASTM E84 Standard Test Method for Surface Burning Characteristics of Building Materials

ASTM E2570 Standard Test Methods for Evaluating Water-Resistive Barrier (WRB) Coatings Used under Exterior Insulation and Finish Systems (EIFS) or EIFS with Drainage, Section 8.5.2

This tests the ability of a fluid applied air barrier materials applied to sheathing materials to withstand the racking of the substrate.

ASTM D412 Standard Test Methods for Vulcanized Rubber and Thermoplastic Elastomers—Tension, Method A, Die C

This tests the tensile strength, elongation and elastic recovery of air barrier materials that accommodate movement of the substrate that they are applied to via the elasticity of the material.

ASTM D543 Standard Practices for Evaluating the Resistance of Plastics to Chemical Reagents, Practice a, Procedure 1 (sodium hydroxide solution, 10% concentration with a pH of 12)

This tests the ability of an air barrier material to withstand exposure to alkaline water. This test would be applicable to materials that are applied to alkaline substrates such as concrete or CMU that may be subjected to wetting during the

construction process and air barrier materials that have a cementitious based material applied over the top them.

Testing of Air Barrier Assemblies

The laboratory testing requirements for air barrier assemblies are listed in Technical Note 4. Additional laboratory testing for properties to be used in assessing the suitability of an air barrier material for use on a project are as follows:

ASTM E331 Standard Test Method for Water Penetration of Exterior Windows, Skylights, Doors, and Curtain Walls by Uniform Static Air Pressure Difference

NFPA 285 Standard Fire Test Method for Evaluation of Fire Propagation Characteristics of Exterior Wall Assemblies Containing Combustible Components

Field Testing and Inspection of Air Barrier Material Installations

ABAA Quality Assurance Program requires daily visual inspection and testing of installed air barrier materials and assemblies. The testing and inspection protocols for the various air barrier materials is as follows:

Rigid Cellular Thermal Insulation

- Visual inspection
- Adhesion testing of tapes used to seal joints, terminations and transitions
- Compliance with the requirements of the contract documents

Factory Bonded Membranes to Sheathing

- Visual inspection
- Adhesion testing of the membrane to the substrate
- Compliance with the requirements of the contract documents

Fluid Applied Membranes

- Visual inspection
- Adhesion testing of the membrane to the substrate
- Compliance with the requirements of the contract documents

Mechanically Fastened Commercial Building Wraps

- Visual inspection
- Compliance with the requirements of the contract documents

Self-Adhered Membranes

- Visual inspection
- Adhesion testing of the membrane to the substrate
- Compliance with the requirements of the contract document

Medium Density Spray Polyurethane Foam Insulation

- Visual inspection
- Adhesion testing of the material to the substrate
- Density testing
- Compliance with the requirements of the contract documents

Adhesive Backed Commercial Wraps

- Visual inspection
- Adhesion testing of the material to the substrate
- Compliance with the requirements of the contract document

Non-Insulation Board Stock Materials

- Visual inspection
- Adhesion testing of tapes used to seal joints, terminations and transitions
- Compliance with the requirements of the contract documents

Adhesion testing is to be performed per ASTM D4541 Standard Test Method for Pull-Off Strength of Coatings Using Portable Adhesion Testers.

Field Testing and Inspection of Air Barrier Assemblies

Field testing of air barrier assemblies are typically testing of mock-up panels that are either stand alone or in place. The testing of these assemblies can be performed using the following test methods:

ASTM E741 Standard Test Method for Determining Air Change in a Single Zone by Means of a Tracer Gas Dilution

ASTM E779 Standard Test Method for Determining Air Leakage Rate by Fan Pressurization

ASTM E3158 – 18 Standard Test Method for Measuring the Air Leakage Rate of a Large or Multizone Building

ASTM E1186 Standard Practices for Air Leakage Site Detection in Building Envelopes and Air Barrier Systems

Summary

This Technical Note contains information about the air barriers. This information may be used to design and build building enclosure assemblies.

The information and suggestions contained in this Technical Note are based on the available data and the experience of the Technical Committee of the Air Barrier Association of America. The information contained herein must be used in conjunction with good technical judgment and a basic understanding of the properties of air barriers. Final decisions on the use of the information contained in this Technical Notes are not within the purview of the Air Barrier Association of America and must rest with project owners, architects, engineers, consultants and contractors.