

Fluid-Applied Air, Water and Vapor Barriers – 1 hrs FAAWV2

Participants will learn the role of barriers in building envelope performance, learn the various components of an air barrier system, learn how to treat rough openings in the wall using fluid-applied air barrier systems, learn air barrier requirements and ways to demonstrate compliance - review the battery of tests that verify performance, learn the similarities and differences between air, vapor and water-resistive barriers and understand the criteria of a performance-based fluid-applied barrier material specification. Course qualifies for HSW and SD credits.

Fluid-Applied Air, Vapor and Water-Resistive Barriers

Function and Specification

In this presentation, you will learn

- **The role of barriers in building envelope performance**
- **Methods of evaluating air barrier/water-resistive barrier material and assembly performance**
- **How to treat rough openings using fluid-applied air barrier systems**
- **How to evaluate air barrier system performance after installation**
- **What to require in a performance-based fluid-applied barrier material specification**

Why use barriers?

- **Water-resistive and vapor barriers became popular in the 20th century**
- **Air barriers gaining acceptance in the 21st century**

Three barrier types

- **Water-resistive barriers**
- **Air barriers**
- **Vapor barriers**

Water vapor permeability

- **Vapor impermeable barrier**
- **Vapor permeable barrier**
- **ASTM E96 is used to test water vapor permeability**

Vapor impermeable barriers (vapor retarders)

- **Used to retard water vapor transmission**
- **Design principles:**

Air barrier performance requirements

- **Two (of many) requirements - air barriers shall:**
- **Air Barrier Association of America (ABAA) requirements**
- **ICC-ES requirements are focused on sheathed construction**

Why are Acceptance Criteria important?

- **ICC-ES Acceptance Criteria qualify products as alternates to materials specifically referenced in building code**
- **ICC-ES Acceptance Criteria define key performance criteria and test methods**
- **ICC-ES listed products are 3rd-party recognized as fit for use**

ICC-ES AC 212 Acceptance Criteria for Water-resistive Coatings used as Water-resistive Barriers over Exterior Sheathing

- **Structural, Racking, Restrained Environmental Conditioning, and Water Penetration Testing**

ICC-ES Acceptance Criteria AC 212

- Weathering test:
- Freeze/thaw testing:
- Water-resistance test (ASTM D2247, samples include sheathing joints)
- Tensile Bond test (ASTM C297):

ICC-ES Acceptance Criteria AC 212

- AC 212 testing criteria define rigorous parameters for acceptance of water-resistive coatings
- NEW optional ICC-ES AC 212 test

Air barrier definitions

- Air barriers are systems that collectively seal the building enclosure

Examples of air barrier assemblies

- Penetrations
- Flashings and rough openings

Air barrier systems

- Rough opening treatment is part of the air barrier system

Fluid-applied window rough opening treatment

ICC-ES AC 148 Acceptance Criteria for Flexible Flashing Materials

- “The reason for development of this criteria is that the cited codes do not provide procedures for evaluating flashing materials for use at wall penetrations and roof hips and ridges”*
- Water-resistance Test
- Nail Sealability (modified ASTM D1970)

ICC-ES AC 148 Acceptance Criteria for Flexible Flashing Materials

- Peel Adhesion
- Resistance to Peeling from Itself
- Cold Temperature Pliability
- Tensile Strength

ASTM E2357 Air Leakage of Air Barrier Assemblies – the test that pulls it all together

- Wall mockup test
- Evaluates material combinations

ASTM E2357 + AC148 + AC212

- ICC-ES AC148 *Acceptance Criteria for Flexible Flashings* + ICC-ES AC212 *Acceptance Criteria for... Water-resistive Barriers over Exterior Sheathing*
- ICC-ES AC212 + ASTM E2357
- ICC-ES AC148 + ASTM E2357

Air Barrier Association of America (ABAA)

- Provide a Quality Assurance Program
- Approval process for air barrier materials

Air barrier performance testing

- ASHRAE 90.1-2007 Addendum Z

Air barrier performance testing

- US Army Corps of Engineers

Air barrier testing

- **ASTM E779** *Standard Method for Determining Air Leakage Rate by Fan Pressurization*
- **ASTM E1827** *Standard Test Methods for Determining Air Tightness of a Building using an Orifice Blower Door*
- **ASTM C1060** *Standard Practice for Thermographic Inspection of Insulation Installations in Envelope Cavities of Frame Buildings*
- **ASTM E1186** *Standard Practices for Air Leakage Site Detection in Building Envelopes and Air Barrier Systems*
- **Be aware of these tests**

Air barriers and LEED credit contributions

- **Energy & Atmosphere Credit 2 - Optimize Energy Performance**
- **Indoor Environmental Quality Credit 7.1 – Thermal Comfort: Design**

Air barrier design and construction

- **Many trades may be involved**

Air barrier wrap-up

- **Air barriers are becoming more widely used**
- **Air barriers require attention to detail by all parties**
- **Air barrier opportunities to innovate and differentiate**

Specifying fluid applied air/vapor/water-resistive barriers

- **Vapor barriers**
- **Water-resistive barriers**
- **Air barriers**