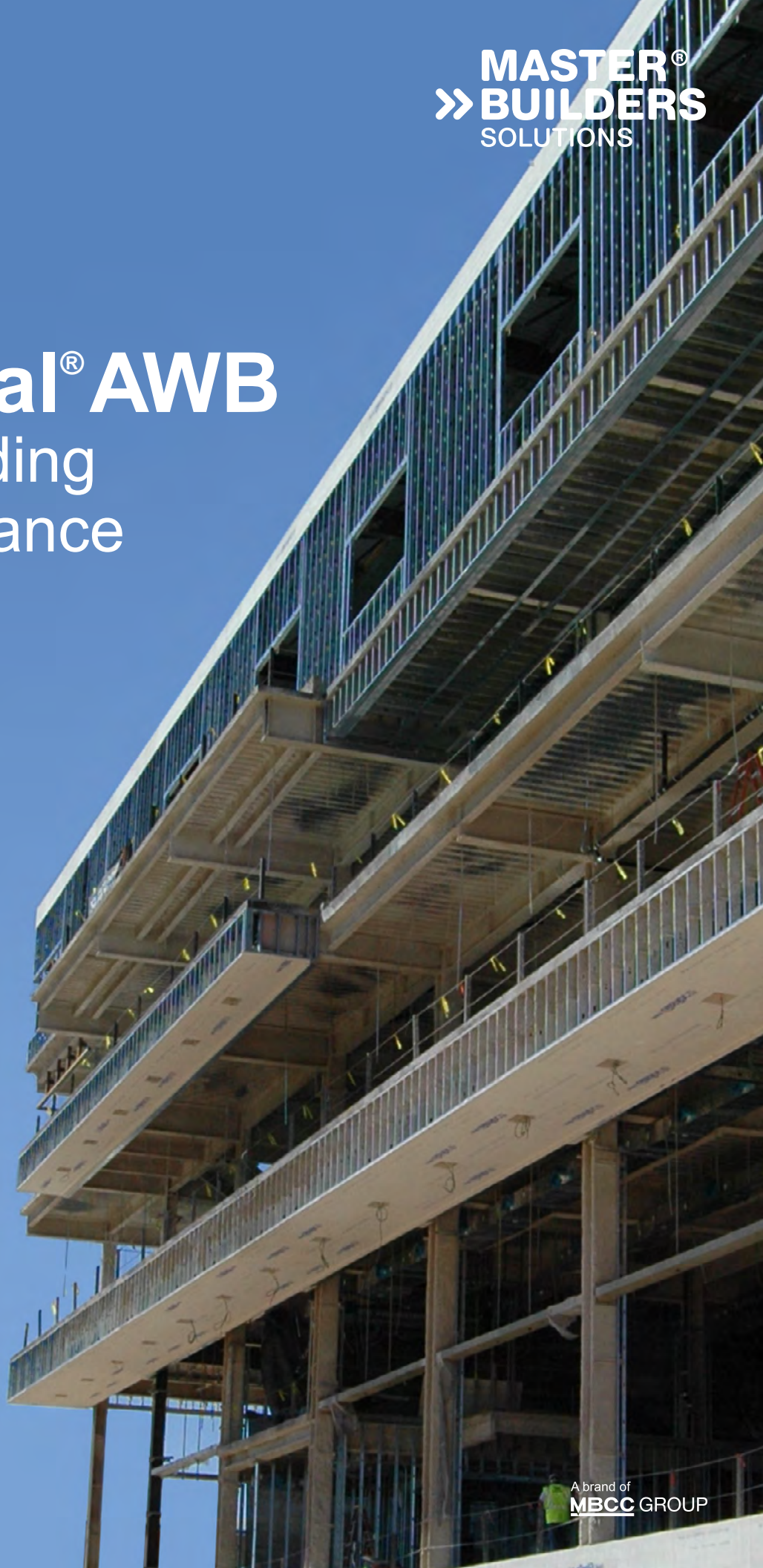
MASTER® BUILDERS SOLUTIONS

MasterSeal® AWB

Fire and Building Code Compliance



A brand of MBCC GROUP

Code Compliant Air / Water-Resistive Barriers

Design for energy efficiency is now a mainstream architectural practice. Widespread adoption of the 2012 International Energy Conservation Code (IECC), the USGBC LEED program and ASHRAE 90.1-2010 has driven significant change in building design, notably by increasing the thermal efficiency of the building envelope. As a result, use of air barriers and foam plastic insulation on the exterior of wall assemblies has become more prevalent. This has created new issues that design professionals must address.

The first relates to fire performance. When combustible materials are used on a wall assembly in Type I-IV (non-combustible) construction, fire safety requirements of local authorities and/or the International Building Code (IBC) must be met. A second issue is protection from moisture. While moisture is not a new concern, materials used for moisture management can affect fire performance of the wall assembly. For combustible insulation used in Type I-IV construction, the 2000 IBC added an NFPA 285 assembly test requirement. In addition, the fire requirements of the 2012 International Building Code (IBC) that pertain to air/water-resistive barriers have been updated.

Considerations Related to Wall Design
Framed Construction

Code requirements for fluid-applied air/water-resistive barriers used on framed construction are clearly defined.With the exception of certain barrier wall designs, all framed construction requires a water-resistive barrier. Fire, moisture and air barrier performance requirements are interpreted under the International Code Council Evaluation Services (ICC-ES) AC212, the Acceptance Criteria for Water-Resistive Coatings used as Water-Resistive Barriers over Exterior Sheathing.

ICC-ES AC212 provides a third-party method of demonstrating code compliance for fluid-applied materials. For Type I – IV construction, the fire performance requirements of ICC-ES AC212 have been updated as follows:

2009 and earlier IBC:
Air/water-resistive barriers must achieve a Class A flame spread and smoke developed index rating according to ASTM E84 Standard Test Method for Surface Burning Characteristics of Building Materials.

2012 IBC:

For buildings less than 40’ high, the air/water-resistive barriers must achieve a Class A flame spread and smoke developed index rating according to ASTM E84. For buildings greater than 40’ high, in addition to ASTM E84 Class A air/water-resistive barrier fire performance, the wall assembly must be tested in accordance with NFPA 285, supported with an engineering analysis that demonstrates compliance with NFPA 285, or otherwise shown to be code compliant.

Concrete Masonry Substrates

ICC-ES AC212 does not address concrete masonry construction. Nevertheless, wall assemblies that incorporate combustible air barrier products trigger the NFPA 285 requirement of the 2012 IBC for Type I-IV buildings more than 40’ tall. Where combustible air barriers are used in Type I-IV construction on buildings less than 40’ tall, or where 2009 or earlier versions of the IBC are in force, it is reasonable to require ASTM E84 Class A performance when specifying fluid-applied air barriers for concrete masonry substrates. This follows the IBC interpretation provided by ICC-ES AC212.

Wall Assemblies that use Combustible Insulation

While ICC-ES AC212 and updated IBC fire test requirements are specific to air/water-resistive barriers, use of plastic foam insulation separately creates a need for NFPA 285 assembly testing in Type I-IV construction.

Performance Requirements of ICC-ES AC212

In addition to fire testing, ICC-ES AC212 evaluation is comprised of: Structural, Racking, Restrained Environmental Conditioning and Water Penetration Testing This 4-test sequence exposes an 8'x 8' mockup to simulated wind loads, building movement and outdoor exposure prior to simulated wind-driven rain. It is designed to evaluate the ruggedness of sheathing joint treatments and waterresistive coating performance.

Hydrostatic Pressure Test

Water-resistive barriers must withstand a 550 mm (21.7 inch) column of water for 5 hours after simulated outdoor exposure.

Freeze/Thaw Testing

Products are subjected to 10 cycles of 8-hour immersion in water at 75 ºF followed by 16-hours at -20 °F, then 8-hours drying at 120 ºF. This test evaluates the ability of the water-resistive barrier to withstand aggressive outdoor exposure conditions.

Water Resistance

Both sheathing joints and substrate coatings must resist 14-days of continuous exposure to 100% humidity at 100 ºF with no deleterious effects.

Tensile Bond

Minimum 15 psi bond strength.

Air Permeation of Building Materials

This test qualifies a material as an air barrier under IECC.

The International Code Council requires that all testing be performed in a third-party test facility. Once complete, ICC Evaluation Services conduct a review of test results and manufacturer Quality Assurance and Quality Control documents. If all requirements are satisfied, ICC-ES issues an Evaluation Report confirming compliance with relevant sections of the IBC and IECC. After an Evaluation Report has been issued, ICC-ES audits manufacturers to ensure product consistency.

For design professionals, ICC-ES Evaluation Reports offer a way to specify code-compliant products in a simple and comprehensive manner. On the jobsite, ICC-ES Evaluation Reports and product labelling requirements provide a direct way to confirm code compliance to building code inspectors.

MasterSeal AWB Products Facilitate Code Compliance

MasterSeal AWB 660, 600 I and 665 are covered by ICC-ES Reports 3209 and 3310 respectively, which confirm compliance with ICC-ES AC212 and ICC-ES AC148 Acceptance Criteria for Flexible Flashing Materials. They are supported by NFPA 285 testing and engineering analyses covering a wide range of wall assemblies. In addition to compliance with ICC Acceptance Criteria, MasterSeal AWB products are recognized as acceptable air barrier materials by the Air Barrier Association of America (ABAA).

MasterSeal AWB NFPA 285 Tested Wall Assemblies

NFPA-285 compliant wall assemblies incorporating MasterSeal AWB products can be found at www.master-builders-solutions.com/EN-US. This web-only document is updated as new data is obtained.

Silica Fortified Rubber™ Chemistry Creates High Performance

MasterSeal AWB products employ unique Silica Fortified Rubber™ chemistry to provide an optimized balance of properties. They are tough and abrasion-resistant, and also offer self-sealing properties when penetrated with commonly used fasteners.

Silica Fortified Rubber chemistry is polymer-based and plasticizer-free. This provides enhanced compatibility and stable long-term performance, with no loss of properties or effect on adjacent materials due to plasticizer migration. It also provides exceptional extreme temperature performance. MasterSeal AWB 660, 660 I and 665 offers an ASTM D5147 Compound Stability rating of 350 °F. They have also passed the ASTM D1970 Cold Temperature Pliability test, with no cracks after bending around a 1” mandrel at 0 °F. Benefits of Silica Fortified Rubber chemistry include UV-stability, with a 6-month outdoor exposure rating. In addition, chemically stable MasterSeal AWB 660, 660 I and 665 offer a 2-year shelf life in the original, unopened containers. MasterSeal AWB products are designed to minimize their contribution of combustible materials to wall assemblies. Both MasterSeal AWB 660, 660 I and 665 provide NFPA 285 compliance and ASTM E84 Class A performance without use of halogen or phosphorus flame retardants. MasterSeal AWB products are water-based, with low odor and low VOC-content. They have been carefully formulated to minimize toxicity. Equipment can be cleaned with water, eliminating the need for solvents and citrus-based cleaners. Silica Fortified Rubber chemistry is respectful of the environment and the people who apply MasterSeal AWB.

Fire and Building Code Compliance FAQs

What is NFPA 285?
NFPA 285 is a 30-minute test conducted on a two story wall assembly. It is designed to simulate conditions that lead to vertical fire propagation from one floor to the floor immediately above it. Test results apply to the specific wall assembly that has been tested. In some cases compliance with NFPA 285 can be verified by engineering analysis.

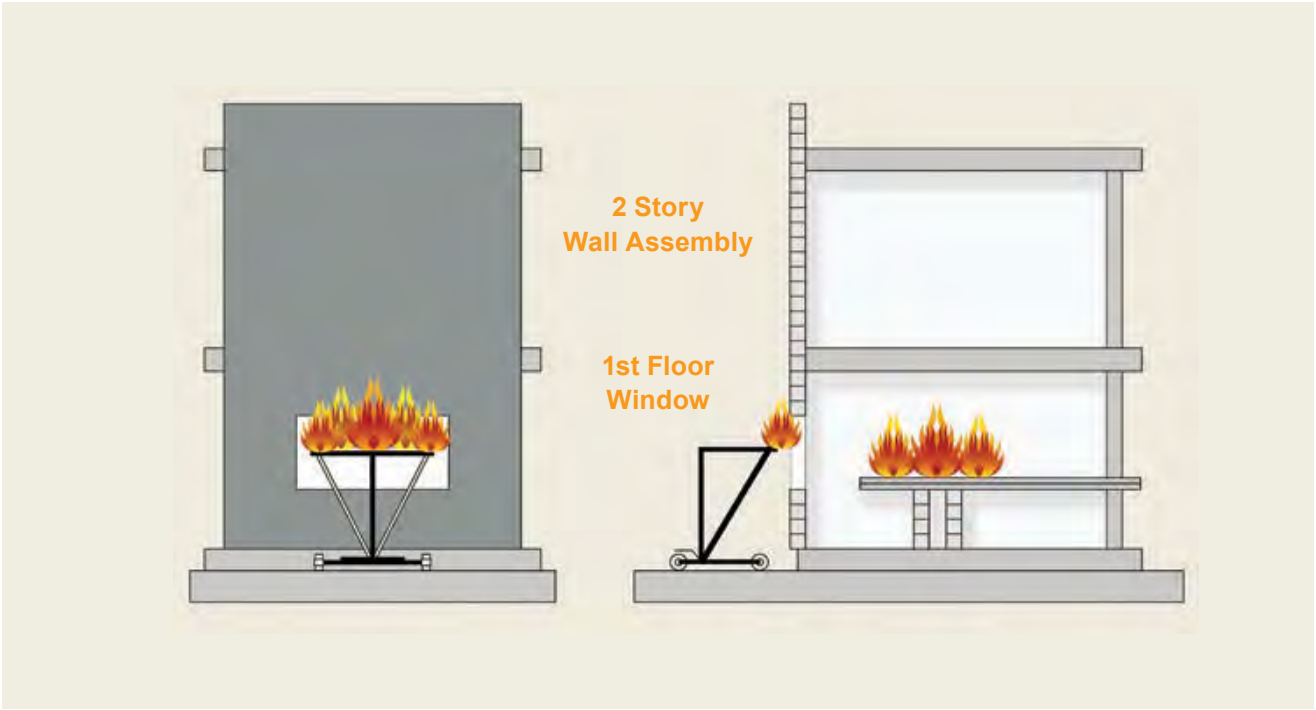
What is ASTM E84?
ASTM E84, also known as the Steiner Tunnel Test, is a 10-minute test in which a horizontal specimen is ignited with a gas burner under a controlled draft. Materials with a Class A rating provide <25 Flame Spread and <450 Smoke Developed Index.

Is it possible for an air/water-resistive barrier to provide performance that complies with NFPA 285?
No. NFPA 285 evaluates the performance of the overall wall assembly. All of the materials in the assembly combined with assembly design work together to create the final result.

Is it possible for an assembly that includes an air/water-resistive barrier with ASTM E84 Class A performance to fail an NFPA 285 test?
Yes. The air/water-resistive barrier is one component of the assembly. The entire assembly must work together to meet NFPA 285 performance requirements.

What are ICC-ES Acceptance Criteria, and why are they important?
Products that are specifically referenced in the IBC are by definition code compliant. For products not referenced in the code, ICC-ES Acceptance Criteria provide a way for building product manufacturers to confirm code compliance.

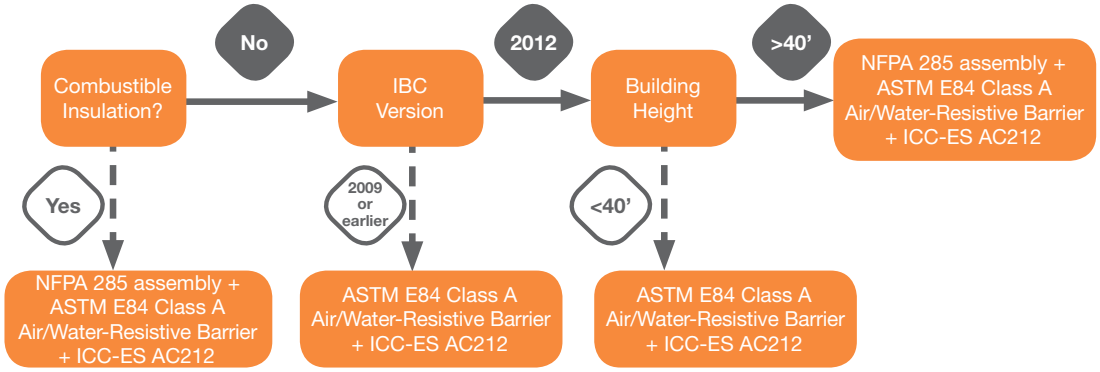
Acceptable Criteria are established through public hearings with the input of industry experts and Building Official Committee input. They establish minimum testing, quality assurance and quality control requirements that products and their associated production practices must meet to demonstrate compliance with relevant aspects of the IBC and IECC.



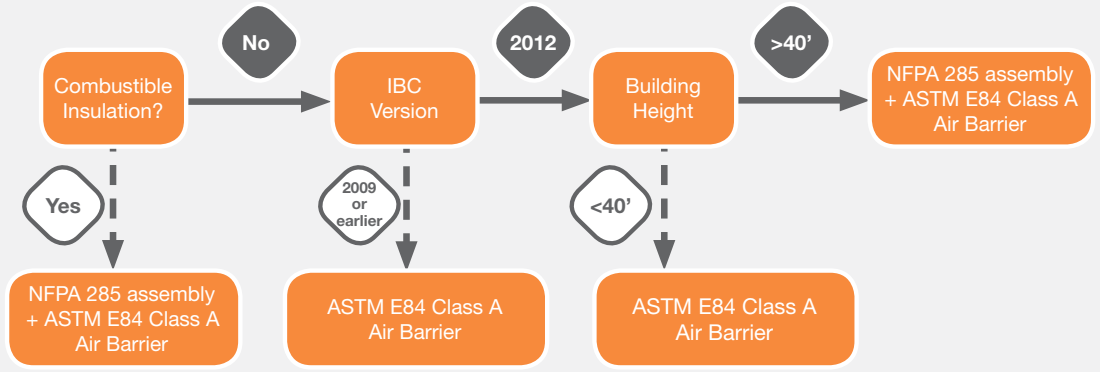
Fluid-applied Air Barrier Code Compliance Guide*

The flow charts below illustrate pathways that can be followed to specify code-compliant air/water-resistive barriers.

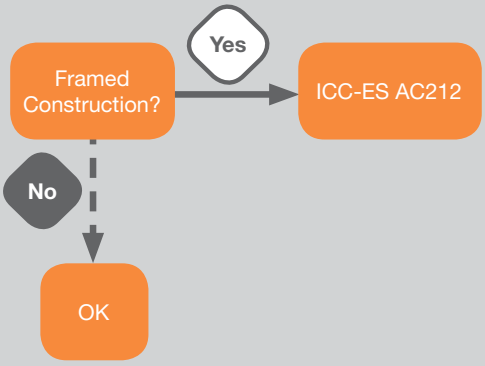
Framed Type I-IV Construction Code Compliance



Concrete / Masonry Type I-IV Construction Code Compliance



Type V Construction Code Compliance



*Note: Per IECC, materials used for the air barrier system shall have air permeability not to exceed 0.02 L/s•m^2 @ 75 Pa when tested in accordance with ASTM E2178.

Master Builders Solutions

The Master Builders Solutions brand brings all of MBCC Groups expertise together to create chemical solutions for new construction, maintenance, repair and renovation of structures. Master Builders Solutions is built on the experience gained from more than a century in the construction industry.

The know-how and experience of a global community of MBCC Group construction experts form the core of Master Builders Solutions. We combine the right elements from our portfolio to solve your specific construction challenges. We collaborate across areas of expertise and regions and draw on the experience gained from countless construction projects worldwide. We leverage global MBCC Group technologies, as well as our in-depth knowledge of local building needs, to develop innovations that help make you more successful and drive sustainable construction. The comprehensive portfolio under the Master Builders Solutions brand encompasses concrete admixtures, cement additives, chemical solutions for underground construction, waterproofing solutions, sealants, concrete repair and protection solutions, performance grouts and performance flooring solutions.

Master Builders Solutions products for the Construction Industry:

MasterAir®
Solutions for air-entrained concrete

MasterBrace®
Solutions for concrete strengthening

MasterCast®
Solutions for manufactured concrete product industry

MasterCem®
Solutions for cement manufacture

MasterEmaco®
Solutions for concrete repair

MasterFinish®
Solutions for formwork treatment

MasterFlow®
Solutions for precision grouting

MasterFiber®
Comprehensive solutions for fiber reinforced concrete

MasterGlenium®
Solutions for high-performance concrete

MasterInject®
Solutions for concrete injection

MasterKure®
Solutions for concrete curing

MasterLife®
Solutions for enhanced durability

MasterMatrix®
Advanced rheology control solutions for self-consolidating concrete

MasterPel®
Solutions for water tight concrete

MasterPolyheed®
Solutions for high-performance concrete

MasterPozzolith®
Solutions for water-reduced concrete

MasterProtect®
Solutions for concrete protection

MasterRheobuild®
Solutions for super-plasticized concrete

MasterRoc®
Solutions for underground construction

MasterSeal®
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MasterSet®
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MasterSure®
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MasterTop®
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