Air Barrier Code Requirements

An air barrier is "one or more materials joined together in a continuous manner to restrict or prevent the passage of air through the building thermal envelope and its assemblies."[i]

The use and application of air barriers within non-residential construction is primarily defined by the *International Energy Conservation Code* (IECC)[ii] or the *Building Energy Efficiency Standards for Residential and Nonresidential Buildings* (CEC).[iii] The IECC and the CEC each mandate air barriers for most buildings and define materials or systems that are acceptable for use as an air barrier.

Achieving Code Compliance

Compliance with air barrier requirements contained in the identified codes is achieved by one of three options:

- Installing code-approved air barrier materials
- Installing code-approved air barrier assemblies
- Whole building testing

An air barrier material or assembly is defined by its air permeance. To be defined as an air barrier material by either the IEEC or the CEC, air permeance of the material must be not greater than or equal to specific criteria when the material is tested in accordance with the ASTM E2178 standard as defined in the code. Assemblies of materials intended to function as an air barrier are required to be tested to ASTM E2357, ASTM E1677 or ASTM E383.[iv]

The IECC and the CEC contain nearly identical lists of materials that are deemed to comply with the requirement for an air barrier "provided joints are sealed and materials are installed as air barriers in accordance with the manufacturer's instructions"[v]. The lists are in Section C402 of the 2018 IECC and Section 140.3 of the 2016 CEC and include materials such as:

- Minimum 3/8-inches thick plywood or oriented strand board
- Minimum ½-inches thickness of extruded polystyrene or foil-back polyisocyanurate insulation board
- Minimum 1 ½-inches thickness of closed- cell spray foam with a minimum density of 1.5 pcf
- Minimum 4 ½-inches thickness of open cell spray foam with a minimum density between 0.4 and 1.5 pcf
- Minimum ½-inches thick exterior or interior gypsum board (panel) or cement board
- Minimum of 5/8-inches thickness of portland cement/sand parge, or gypsum plaster
- Cast-in-place and precast concrete
- Fully grouted concrete block masonry
- Sheet steel or aluminum
- Specific, defined roofing membranes
- Specific, defined masonry materials

In a similar manner, both the IECC and the CEC identify deemed to comply assemblies. Because some differences exist between the assembly lists in the IECC and the CEC, the code text should be consulted for definitive information. The assembly lists are in Section C402.5 of the 2018 IECC and Section 140.3 of the CEC.

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Whole building testing to comply with the IECC or the CEC is in accordance with ASTM E779 or an equivalent method that is approved by the authority having jurisdiction.

Local codes or statutes may impose requirements beyond those contained in the IECC or CEC. An air barrier specialist may be consulted for input on appropriate materials or assemblies.

For more information on air barriers visit https://www.buildingscience.com/

[i] *2018 International Energy Conservation Code*, International Code Council, Country Club Hills, IL, 2017, www.iccsafe.org
[ii] Same as previous item
[iii] *2016 Building Efficiency Energy Standards for Residential and Nonresidential Buildings (California Code of Regulations; Title 24, Part 6)*, California Energy Commission, Sacramento, CA, 2015, https://ww2.energy.ca.gov/title24/2016standards/ The document is also known as the California Energy Code (CEC).
[iv] Information from 2018 IECC and similar in the 2016 CEC. Consult the CEC for specific titles of referenced documents. ASTM standards are available from ASTM International www.astm.org
[v] Same as previous item

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