

# Breeze Your Way Through the IECC's Latest Air Barrier Requirements



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# Air Barrier Inspections & Testing Has Come to the 2021 IECC

- Standard part of Residential Construction since 2009 IECC
- Some municipalities have previously required this:
  - Fort Collins
  - Boulder
  - Denver (Started in 2018 IECC Adoption)



Photo Credit – Nathan Kahre

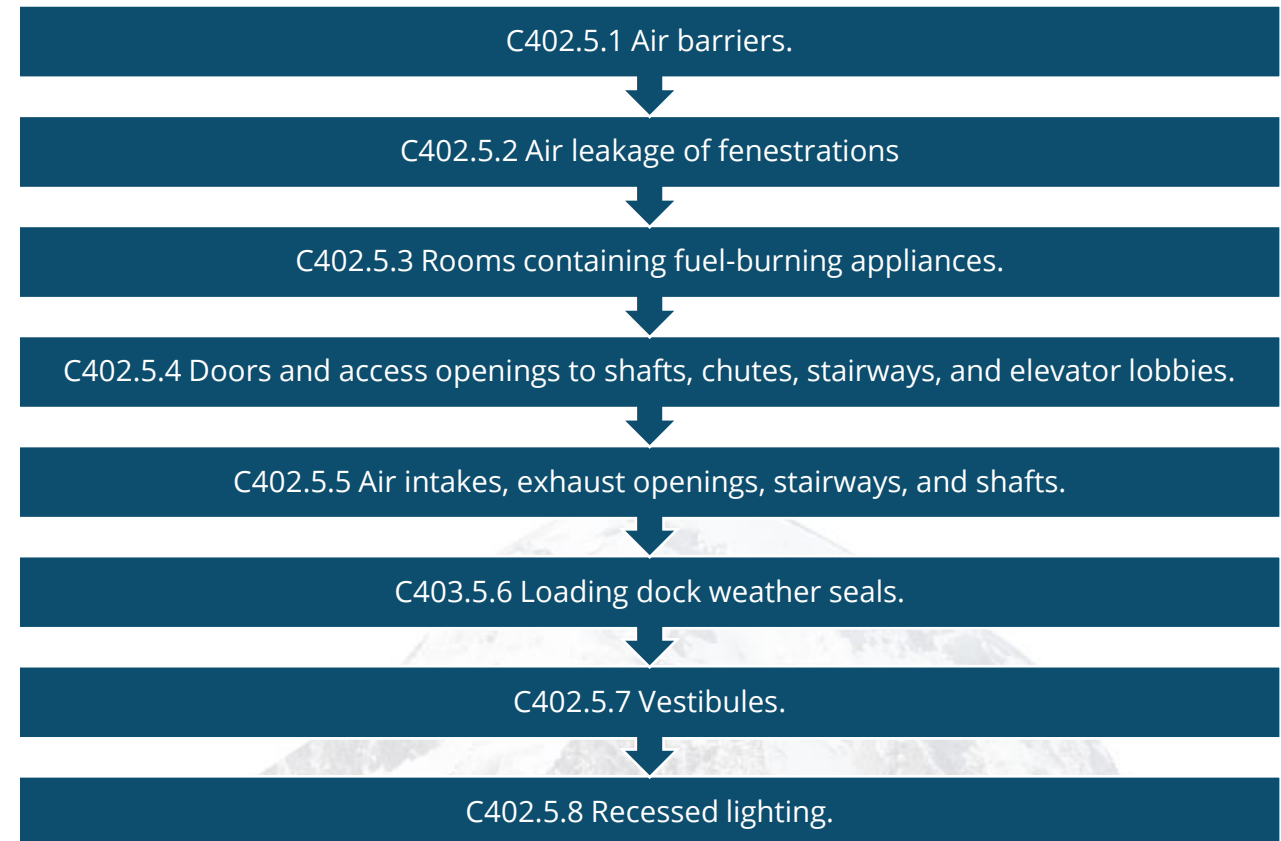
# IECC Layout

- Two Main Sections – Commercial & Residential Provisions
  - Residential includes single family, duplex, townhomes, & low rise multifamily.
  - Commercial includes all over buildings.
- Each Section Provides Requirements for Different Parts of the Building
  - Envelope, Mechanical Systems, Lighting, Etc.
- Each Section Also Provides Multiple Compliance Pathways
  - Prescriptive – Complete all the listed requirements.
  - Performance/Modeled Pathways – Complete mandatory requirements and show compliance through an energy model.



# Air Barriers in the Commercial Provisions of IECC (2018 IECC Review)

- Section C402.5 Air Leakage (Mandatory)
- Compliance Pathways
  - Meet Section C402.5.1 through C402.5.8
  - Perform an air leakage test.



# What To Except?

- Start with Denver Amendments to the 2018 IECC
- Move on to 2021 IECC



Photo Credit - [City of Denver](#) & [International Code Council](#)





# Denver Air Barrier Amendments

- 3 amendments based on changes to 2021 IECC
    - Changes to the Air Barrier Compliance Requirements.
    - Addition of Building Thermal Envelope Performance Verification.
    - Addition of Building Thermal Envelope Testing.
  - 1 amendment to help implementation
    - Addition of Building Thermal Envelope Corrective Measures.
- For detailed code sections go to [Denver Building Code Amendments Pg. 542](#)



# Changes to Air Barrier Compliance Requirements

**C402.5.1.2 Air barrier compliance options.** A continuous air barrier for the opaque building envelope shall comply with the following:

1. Buildings or portions of building *including Group I occupancies shall meet the provisions of Section C402.5.1.2.1 or C402.5.1.2.2 and C402.5.1.2.3*
  2. Buildings or portions of buildings of *other than Group I occupancy shall meet the provisions of Section C402.5.1.2.3*
- C402.1.2.3 Is not included in the 2018 IECC.
  - 2018 IECC does not set separate requirements for Group I from other occupancies.





# Building Thermal Envelope Performance Verification

**C402.5.1.2.3 Building thermal envelope performance verification.** The installation of the continuous air barrier shall be verified by a registered design professional or approved agency in accordance with the following:

1. A review of the construction documents and other supporting data shall be conducted to assess compliance with the requirements in Sections C402.5.1.
2. Inspection of continuous air barrier components and assemblies shall be conducted during construction while the air barrier is still accessible for inspection and repair to verify compliance with the requirements of Section C402.5.1.1 and C402.5.1.
3. A final commissioning report shall be completed by the register design professional or approved agency and provided to the building owner or owner's authorized agent and the code official. The report shall identify deficiencies found during the review of the construction documents and inspection and details of corrective measures used.



# Building Thermal Envelope Testing

**C402.1.3 Building thermal envelop testing.** The building thermal envelope shall be tested in accordance with ASTM E 779 or an equivalent method approved by the code official.

Exception: Testing shall not be required to include all portions of the building thermal envelope where the following portions of the building are tested, and the measured air leakage is area-weighted by the surface are of the building thermal envelop in each portion:

1. The entire envelope area of all stories that have any spaces directly under a roof,
2. The entire envelope are of all stories that have a building entrance, exposed floor, loading dock, or are below grade, and
3. Representative above-grade sections of the building totaling at least 25 percent of the wall are enclosing the remaining conditioned space.



# Building Thermal Envelope Corrective Measures.

**C402.4.1.3.1 Building thermal envelope corrective measures.** Where the measured air leakage rate exceed  $0.40 \text{ cfm/ft}^2$  a diagnostic evaluation using smoke tracer or infrared imaging shall be conducted while the building is pressurized along with a visual inspection of the air barrier. Any leaks noted shall be sealed where such sealing can be made without destruction of existing building components. An additional report identifying the corrective actions taken to seal leaks shall be submitted to the code official and the building owner.





# Process for Compliance with IECC in Denver

## 1. Perform Air Barrier Plan Review

Document deficiencies and corrective actions taken.



## 2. Install Air Barrier

Following construction documents and manufacturer installation instructions.



## 3. Inspect the Air Barrier

Document deficiencies and corrective actions taken.



## 4. Perform Air Leakage Test

If building doesn't meet 0.4 CFM/SF. Investigate leaks and correct.



# Application of Air Leakage Testing

- Small commercial spaces – up to 100,000 SF.
  - Can be accomplished with a single test.
- Multifamily structure with conditioned central corridor.
  - Can be accomplished with a single test.
- Multifamily structure with open corridors and individual entrances.
  - Need to be tested individually.



# What About the 2021 IECC?

- No municipality in Colorado has adopted it yet.
  - Energy Logic expects Fort Collins and Castle Rock to be the early adopters.
- 2021 IECC requirements sorted by Climate Zone.
  - Building between 5,000 – 50,000 SF are exempted from testing in our Climate Zone.
  - Municipalities could amend this exemption out.
- Allows for sampled dwelling unit testing in multifamily.
- Requires the building envelope verification for buildings that aren't tested.
- Has a corrective action exemption for whole building tests as well.





# EnergyLogic Wants to Help

- Answer additional questions about your project.
- Show examples of plan review and air barrier designs
- Perform inspections and tests on buildings in construction right now. Negotiated pricing available.
- Talk through building preparation for air barrier testing.
- Training for design or construction teams.



# Thank you! Questions?

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**EnergyLogic**

*Our vision: A world where all homes are efficient, healthy, and resilient.*

**ENERGY STAR® Sustained Excellence/Partner of the Year 2009-2014, 2016-2020**

# About EnergyLogic

EnergyLogic is an applied building science company that partners with building professionals to create better homes that are efficient, healthy, and resilient. We are based in Colorado and work worldwide.

