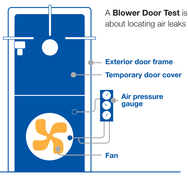
Blower Door Test **101**



A **Blower Door Test** is conducted to pinpoint where buildings are losing energy. It's all about locating air leaks and ultimately making new and old buildings more energy-efficient.

A high-powered fan evacuates air from the building, creating a low-pressure environment. An air pressure gauge on the assembly precisely measures the rate of air exchange in the home. This is often expressed as air changes per hour at a specified pressure, usually 50 Pascal, or ACH50.

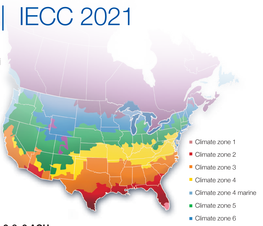
Did You Know?

According to the Department of Energy, the average home has enough air leakage to add up to a two-foot-square hole. **That's equivalent to leaving a window wide open 24 hours a day.**

Meeting Code | IECC 2021

Air barrier inspection and blower door testing are mandatory as part of the 2021 International Energy Conservation Code, Section R402.4.1.2.

Regarding leakage rates for residential properties, the code states, **"The maximum air leakage rate for any building or dwelling unit under any compliance path shall not exceed 5.0 air changes per hour or 0.28 cubic feet per minute (CFM) per square foot of dwelling unit enclosure area."** There is greater flexibility in climate zones 3-8 if the building meets overall energy targets for performance paths.



Climate zone 1&2: 5 ACH | **Climate Zones 3-8: 3 ACH**

Applicable Blower Door Test Standards

ASTM E 779 Standard Test Method for Determining Air Leakage Rate by Fan Pressurization. This test method measures air-leakage rates through a building envelope under controlled pressurization and de-pressurization.

ASTM E 1827 Standard Test Methods for Determining Airtightness of Buildings Using an Orifice Blower Door. These test methods describe two techniques for measuring air leakage rates through a building envelope in buildings that may be configured to a single zone.

Tools of the Trade

A **non-toxic smoke pencil** is a hand-held device that creates a trail of white vapor. An analyst may use a nontoxic smoke pencil during the test to identify air leaks. **Infrared cameras** may also be used to determine aid leakage and insulation.

Inflation Reduction Act

The Inflation Reduction Act extended and expanded many existing credits, including the 45L New Energy Efficient Home Credit for single family and multifamily home builders and the 25C Homeowner Tax Credit.

45L | New Energy Efficient Home Credit

$2500 CREDIT PER DWELLING

Meet or exceed ENERGY STAR® requirements

$5000 CREDIT PER DWELLING

Meet or exceed Department of Energy (DOE) zero-energy ready

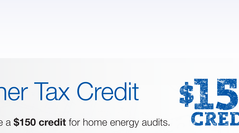
Multifamily projects must meet prevailing wage or the credit per dwelling is reduced.

ENERGY STAR® and DOE Zero Energy Ready Home Requirement

Energy efficiency programs have specific infiltration requirements by climate zone, which are measured by a blower door test. Infiltration requirements must be met to take advantage of credits outlined in the Inflation Reduction Act for single family and multifamily dwellings.

For example, **ENERGY STAR** residential new construction guidelines go beyond code and require that single family and multifamily dwellings achieve a 4 ACH50 in climate zones 1 and 2. Blower Door tests are conducted before and after air sealing to measure the effectiveness of the work.

For reference, **very tight buildings** have an ACH50 of under 1 and **a "loose" building** would be over 7 ACH50. **A good goal for most buildings is 3 ACH50.**



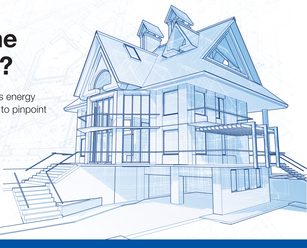
25C | Homeowner Tax Credit

Section 25C was expanded to include a **$150 credit** for home energy audits.

$150 CREDIT

What's a **Home Energy Audit?**

The first step to improving a home's energy efficiency often starts with an audit to pinpoint where homes are losing energy.

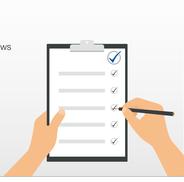


Did You Know?

Home energy audits identify opportunities for cost savings. Homeowners could **save 5-30% on energy bills** by making upgrades to the building envelope.

What's included in an audit?

- Perform a blower door test
- Inspect **windows and doors** for excess condensation
- Check for **air leaks** around outlets, fixtures, doors, and windows
- Check for **wall insulation** and framing type
- Look for indoor **air quality problems**
- Examine thermostat and **test smoke and carbon monoxide detectors**



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