



-Blower Door Testing-

We live in a climate with harsh winters and humid summers, which leads to a significant increase in our energy bills. Homeowners and builders are increasingly turning to blower door tests as a vital tool for ensuring energy efficiency in their homes. These tests are more than just a way to gauge how airtight a structure is – they are a critical component of any energy-efficient home or building

In this month's blog we are going to explore blower door tests and why it is important and how they work.

A blower door is a type of diagnostic test that is used to measure leakage in a home and assess the building's airtightness. A specialized fan is temporarily installed to an exterior doorway. The fan creates the difference in air pressure between the inside of the building and the outside environment. As a result, air leaks in the building's envelope¹-whether around windows, doors, or any other gaps or cracks – are identified.

A blower door test is crucial in determining the energy efficiency of a building. The test measures how much unconditioned air is infiltrating the building, which can have a direct impact on heating and cooling costs.

Why is a blower door test important? Ontario has a variety of climates ranging from harsh winters to hot summers. During these extremes, energy efficiency plays a crucial role in maintaining a comfortable home and lower energy bills.

During our cold winters homeowners rely heavily on their heating systems to stay warm and during the hot and humid summers they rely on their air conditioning to stay cool. A blower door test can help identify the leaks in their homes that will allow the cold air (drafts) come in during the winter and the cool air to escape the home during the summer, reducing the load on heating and cooling systems which save on energy high bills.

Ontario offers rebates including the Home Renovations Savings Program (HRS) which was released in January 2025 to homeowners who improve their home's energy performance. This program involves an energy Audit before work is done to the home then upon completion. During the initial and final audit, a blower door test will be used.

A building with excessive air leakage is not only inefficient but it also contributes to high carbon emissions. By identifying and sealing leaks, you can reduce the environmental footprint of a home, contributing to sustainability efforts.

Now we know what a blower door test is and why they are important now let's talk about what how it works. There are 5 steps we will discuss about how a blower door works.

¹ To learn more about a building envelope check of April 2025 Building Envelope Blog.



1. **Preparation:** The tester will make sure all the exterior doors and windows are closed. The blower door is then installed into an exterior door frame. (See pictures below)
2. **Testing (Pressurization):** The blower door fan is turned on to create the pressure difference from inside the home and outside. The air exchange per hour (ACH) at a pressure of 50 Pascals (Pa) are measured to determine the amount of air leakage from the home. The lower the ACH50 number the more energy efficient the home
3. **Identifying the Leaks:** during the test they may use addition tools like infrared cameras or smoke pencils to visually locate the air leaks. (see pictures below)
4. **Results of the first test:** The results of the initial test are compared to the standards for airtightness, such as the standards for Passive and NetZero homes.
5. **Repairs and retesting:** If any leaks are identified during the blower door test they are sealed, and then the blower door test will be repeated to see the results after sealing identified leaks.



Now that the test is complete, and you have your results what do they mean and where does your house fall in the range.

Building standards: a blower door test typically aims for 2.5-3.5 Air exchange per hour at 50 Pascals (ACH50).

Net Zero Homes²: while net-zero homes aim to offset what they consume; they achieve high airtightness levels at typically below 1.0 ACH50 or less.



Passive Homes³: The Passive House standards set a very strict airtightness requirement of 0.6 ACH50 or less. As you can see this is much lower than a standard build/

Over the past year we have been able to be apart of a few blowers' door test for homes that we insulated, the most resent home was a net-zero home and these were the results.

	Leakage ACH50	Equivalent hole size (square inch)
Pre-sealing	0.75	39.8
Post-sealing	0.37	19.6
Difference	0.38	20.2

² To learn about Net Zero homes, stay tuned for future blogs

³ To learn more about Passive homes stay tuned for future blogs

According to the standards outlined above, the results from the initial blower door test place the home within the Net-Zero range for air sealing, which is consistent with its status as a Net-Zero home. Following the identification and sealing of any leaks during the first test, a second blower door test will be performed. The results of this second test meet the airtight standards typically required for a Passive House. This indicates that the home's air sealing performance aligns with the airtightness levels commonly found in Passive Houses. While it is not classified as a Passive House, the home achieves Passive House-level airtightness, which is a notable accomplishment for a Net-Zero home.

In conclusion, blower door tests are an essential tool for homeowners and builders looking to improve the energy efficiency and comfort of their homes, especially in a climate like Ontario's with its harsh winters and humid summers. These tests not only help identify areas of air leakage that can lead to higher energy costs, but they also play a crucial role in achieving energy-efficient home standards, such as Net-Zero and Passive House levels. By sealing these leaks, homeowners can reduce their heating and cooling loads, lower energy bills, and minimize their environmental footprint. With programs like the Home Renovations Savings Program offering financial incentives for current homes, there's never been a better time to invest in improving your home's energy performance. Whether you're looking to build a more sustainable future or simply save on energy costs, blower door tests are a key step toward achieving these goals.

Insulation isn't sexy it's Smart

