

AeroBarrier vs. Standard Blower Door Test Results

Why AeroBarrier Seal Results Can Be Different than Blower Door Test Results

Blower door testing is the accepted method for assessing the airtightness of a house or other structure where air leakage needs to be measured. While all testing relies on the general principle of using a calibrated fan to create a pressure difference between the house or enclosure and the outdoors, the exact protocol varies across regions and standards. In most cases, blower door tests depressurize the enclosure (i.e. create a lower pressure compared to outside). However, pressurization, or a combination of pressurization and depressurization, can also be used to achieve a leakage rating.

When the AeroBarrier process is used in an enclosure, positive pressure is used to deliver sealant to air leakage sites. As the AeroBarrier sealant fills openings in the enclosure (i.e. leaks), air leakage is reduced. Once this process is complete, the as-found air leakage will be reduced to the level reported by the AeroBarrier system.

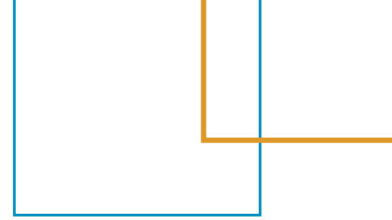
When blower door testing is performed after the fact, the leakage measured by the blower door test generally differs from the value reported by the AeroBarrier system. This does not mean that the seals created by the process somehow changed. Rather, the differences are due to differences in protocol (e.g. building preparation or depressurization versus pressurization) and general measurement uncertainty.

When the AeroBarrier software creates a seal report, it should be considered an enclosure test. With windows, ducts, fireplaces and other designed openings covered during AeroBarrier prep, potential leakage sites are being temporarily covered to avoid sealant deposition at those sites. This leakage will be reintroduced once the AeroBarrier prep is removed. The target line displayed in the AeroBarrier software helps to compensate for some of the reintroduced leakage.

Standard blower door tests are generally “as used” tests, where nothing is taped off or protected. This reintroduces leakage that was removed by AeroBarrier prep or through items like dampers that may not be fully closed.

Potential sources of air flow after AeroBarrier installation

- Differences in preparation between standard blower-door tests and AeroBarrier
- Differences in protocol between AeroBarrier and standard blower door tests (e.g. pressurization versus depressurization)
- Malfunctioning mechanical openings. Vents that should be closed in normal operation but do not maintain air tightness during testing
- New penetrations created since AeroBarrier was installed



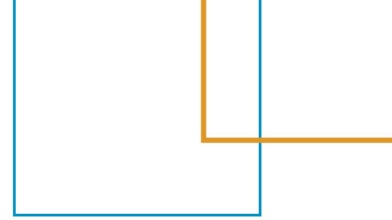
- Test execution variability (gauge calibration, fan calibration, blower window/door fit)
- Seasonal effects on the wood frames due to temperature and humidity changes that affect the tightness of the home

Preparation is Key

Prepping designed openings and areas that aren't to be sealed is a key component to the AeroBarrier process. Special attention should be taken to determine what should be prepped and how that prep should be completed to ensure designed openings are protected without stopping the sealant from addressing leakage that may be occurring around those areas (i.e. protecting supply vents while still allowing the system to seal between the boot and the drywall). The better the prep is planned and executed the less leakage will be added to the enclosure when the prep is removed.

Below is a summary of many of the preparation differences between the AeroBarrier and blower door testing. Note the fundamental difference is the avoidance of sealant deposition on various envelope components.

AeroBarrier Preparation	Blower Door Preparation
<ul style="list-style-type: none"> • Various envelope components temporarily sealed to avoid sealant deposition on those components 	<ul style="list-style-type: none"> • Prepared in the “as used” state. Envelope component are all open, or in the normal-use position
<ul style="list-style-type: none"> • range hoods temporarily sealed 	<ul style="list-style-type: none"> • windows have tape removed
<ul style="list-style-type: none"> • bathroom vents temporarily sealed 	<ul style="list-style-type: none"> • doors have tape removed
<ul style="list-style-type: none"> • dryer vent temporarily sealed 	<ul style="list-style-type: none"> • dryer vent open
<ul style="list-style-type: none"> • Fireplace temporarily sealed 	<ul style="list-style-type: none"> • range hood may be open
<ul style="list-style-type: none"> • Windows are temporarily sealed 	<ul style="list-style-type: none"> • fireplace may be open
<ul style="list-style-type: none"> • Temporary door and window openings are sealed 	<ul style="list-style-type: none"> • ERV /HRV may be open



When the AeroBarrier process is complete

Once sealing is complete and all the prep materials have been removed, all the air flow pathways that were blocked to avoid sealant deposition are now free to flow through the structure. This is the single most important fact to remember; if the windows, vent dampers, or other protected building envelope components have leaks, the AeroBarrier test results will be lower than a blower door test that may follow the seal operation.

Below is a summary of common leakage areas after a seal operation.

Item	Potential Leakage Sources
Kitchen Range Hood	Vent not closed or partially closed – leakage around wall penetration
Bathroom vent	
Dryer	
Newer hot water heater (gas)	
Fireplace	
ERV/HRV	Systems without active flow control will indicate leakage, up to the total flow capacity of the unit.
Windows	Window seals/gaskets and window frame seals
Doors <ul style="list-style-type: none"> • All exterior doors (i.e. Sliding doors) • Attic doors/hatches 	<ul style="list-style-type: none"> - Door gaskets, door construction, overall seal area - Doors that swing out > more leakage with positive pressure, less with negative pressure - Doors that swing in > less leakage with positive pressure, more leakage with negative pressure
HVAC ducts that run through unconditioned areas	Leakage in ductwork looks just like building leakage during a blower door test