BlowerDoor Info

BlowerDoor GmbH
MessSysteme für Luftdichtheit
Premium Partner

The BlowerDoor test

Continuing high energy prices only underline the necessity of energy-efficient building construction and rehabilitation. As part of environmental policy measures, legislators require airtight building envelopes for all new buildings. After all, air tightness is a prerequisite for realizing up-to-date energy concepts. Energy-efficient measures like installing state-of-the-art heating systems or windows can only develop their full potential if undesired leakages in the building envelope are eliminated.

The BlowerDoor measurement allows you to test the air tightness of buildings. It can also protect against severe structural damage caused by warm and humid indoor air penetrating the building construction through joints. In addition, the indoor comfort level rises through the elimination of draughts or cold-air pools. When rehabilitating existing buildings, an air barrier planned according to the recognized standards often achieves current low-energy or even passive-house standards.

The tale of the breathing building

It is a myth that buildings need to have cracks and joints to “breathe naturally”. Such air change occurs in an uncontrolled manner. Too much or too little outdoor air will enter the building. Even worse, pollutants and dust from the insulation mix with the indoor air. A building should consequently be ventilated by frequently opening the windows or via a ventilation system.

A building is considered airtight when the air in the building under testing conditions is not exchanged more than three times per hour. In a building equipped with a ventilation system, the air change at testing pressure cannot exceed 1.5 times per hour. “Airtight” thus does not mean completely sealing a building, but rather avoiding undesired leakages in the building envelope. This is important because warm air flowing out through the joints costs energy. At the same time, the warm air transports moisture. It cools at the outside wall of the building and condenses. This condensation can cause severe structural damage. Outside air infiltrating the building through joints also transports allergens from the insulation and dust particles into the house, which can lead to ill effects on the occupants’ health.

BlowerDoor test of a new single-family home

BlowerDoor measurement in the context of an energetic renovation

Typical building leakages

Construction-related leakages or permeability often occur at connections and penetrations. When planning an air barrier, these areas should be given careful consideration to avoid costly rework later.

Leakage detection with the fog generator BlowerDoor HandFogger

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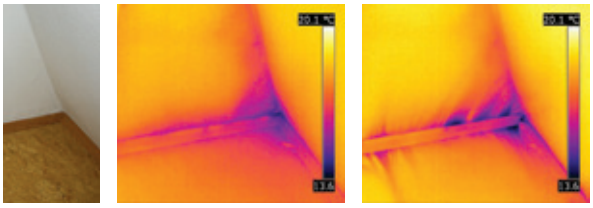
Typical leakages mainly occur in the area of

- junctions and joint butts of building components
- pipe and cable penetrations through the air barrier
- floor junctions at doors and windows at floor level in converted attics
- connections of different building materials (e. g. massive/light construction)
- building extensions and bay windows
- window jambs and external door jambs
- skylights and dormers
- floor hatches

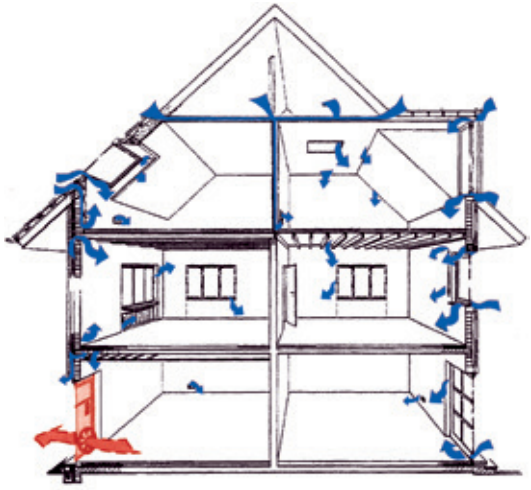


Thermogram of a leakage

Accurate results: Thermogram of a leakage made during the BlowerDoor test

BlowerDoor test: the measuring principle

The Minneapolis BlowerDoor has been used for air tightness measurements in Germany since 1989 and is today one of the most successful testing devices for air tightness worldwide. IR thermography during the BlowerDoor measurement optimally completes the test of the building envelope, delivering comprehensive results and conducive evidence of the condition of the building envelope. These conclusions are illustrated and documented within the quality assurance process.



The measuring principle: A fan draws the air out of the building. Outside air flows into the building through any leaks.

For the measurement, a BlowerDoor fan is installed in an external door or window of the building. All other outside doors and windows are closed. All inside doors of the building remain open. As an acknowledged rule of technology, the automated BlowerDoor procedure is carried out according to the valid standards (EN 13829, ISO 9972). Via the BlowerDoor fan, air is continuously sucked out of the building, so that an imperceptible negative pressure of 50 Pascal is generated within the building. Occupants can remain in the building during the measurement without experiencing any discomfort. If there are leakages in the building envelope, outside air will infiltrate the building through them. During the walkaround, the building is carefully inspected for air flows which are located by means of an anemometer or via IR thermography.

The air barrier is still visible (sheets and wood panels): This is the optimum time for a BlowerDoor measurement.

BlowerDoor 4 you: time of measurement

There are many reasons for a BlowerDoor test. Therefore, the objective of the measurement should be agreed upon in advance. We recommend the BlowerDoor measurement

1. for quality assurance during the construction phase
2. as a final measurement after completion of the construction process
3. before expiry of the warranty (airtightness is owed permanently, not only on the day of measurement)
4. in existing buildings for damage analysis or before a planned refurbishment.

A serious BlowerDoor measurement always includes quality assurance (leakage detection) and is an investment that pays off in any case.

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