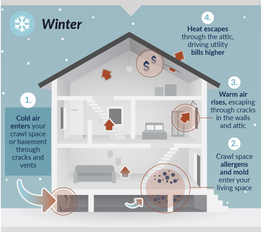
The Stack Effect: What It Is and What it Means for Your Home

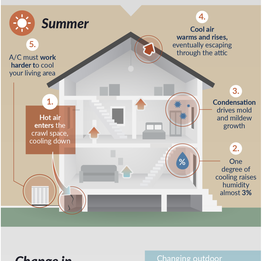
The stack effect not only impacts your home's air quality, but it also affects energy efficiency leading to costly utility bills. Here's what it is and what to do about it.

Get A Free Estimate

The airflow in and around your home can make a big difference in the quality of the air and maintaining the desired temperature. The better you can control that airflow, the lower your utility costs and the higher the quality of air will be inside your home.

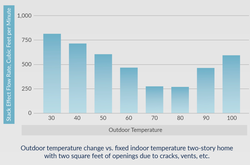
THE STACK EFFECT, ALSO KNOWN AS THE CHIMNEY EFFECT, IS THE NATURAL VERTICAL AIRFLOW THROUGH A HOME. IT CAN BRING ADDED MOISTURE, POOR AIR QUALITY, AND DRIVE UTILITY COSTS THROUGH THE ROOF.





Change in Outdoor Temperature

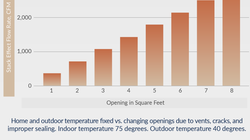
Changing outdoor temperatures drive the airflow through your home.



Outdoor temperature change vs. fixed indoor temperature two-story home with two square feet of openings due to cracks, vents, etc.

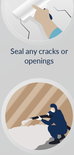
Change in Airflow Openings

Sealing cracks can make a big difference to the airflow in your home



Home and outdoor temperature fixed vs. changing openings due to vents, cracks, and improper sealing. Indoor temperature 75 degrees. Outdoor temperature 40 degrees.

How To Reduce the Stack Effect in Your Home

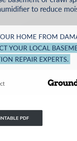

Seal any cracks or openings


Seal around windows and even wall outlets


Add attic insulation


Install crawl space insulation and encapsulation


Add basement insulation and repair cracks


Use basement or crawl space dehumidifier to reduce moisture

TO LEARN MORE ABOUT PROTECTING YOUR HOME FROM DAMAGE CAUSED BY THE STACK EFFECT, CONTACT YOUR LOCAL BASEMENT WATERPROOFING AND FOUNDATION REPAIR EXPERTS.

Source: Groundworks.com/resources/what-is-the-stack-effect

Groundworks

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What Is the Stack Effect?

The stack effect is the natural vertical airflow through a home. It's also what makes a fireplace work by drawing air in, helping the fire come to life, and then rushing out the chimney. Unfortunately, the stack effect in your home can also generate several undesirable phenomena.

In the winter cold air enters your home's basement or crawl space through cracks and open vents. As the air warms, it rises into the rest of your home and then escapes through cracks in the walls and the attic. Any heat escaping causes increased work for the furnace and correspondingly higher utility bills. In addition, the stack effect airflow brings along with it allergens and mold, driving it from your basement or crawl space into the upper floor living areas.

In the summer, hot air enters the basement or crawl space, cooling down. That raises the humidity, resulting in condensation that drives mold and mildew growth. As the cool air warms, it rises through the rest of the house, escaping through cracks in the walls as well as the attic. All that means the air conditioner needs to work harder to cool the air, increasing your utility bills.

Stack Effect Airflow Changes

There are several variables that drive the stack effect's overall airflow. They include the outdoor temperature versus the indoor temperature. Another key variable is the size of the openings at the bottom and top of the home as well as the height of the home.

As an example, a typical two-story house is 20 feet tall, considering nine-foot ceilings. With an indoor temperature of 75 degrees, an outdoor temperature of 60 degrees, and openings in the house from cracks and other items at two square feet, the stack effect airflow will be 467 cubic feet per minute (CFM). In that same home, if the outside temperature drops to 30 degrees, the airflow jumps to 810 CFM. On the other end of the scale, if the outdoor temperature rises to 100 degrees the airflow hits 590 CFM.

The impact of the size of the openings due to cracks and vents can also be seen in these calculations. In the same house with an indoor temperature at 75, an outdoor temperature at 40 degrees, and an opening at two square feet, the stack effect airflow is 714 CFM. If the opening increases to four square feet, the airflow increases to 1,428 CFM. Should the opening decrease to one square foot, the flow rate drops to 357 CFM.

As you can imagine, tall office buildings have an enormous stack effect at work. In fact, the early builders of skyscrapers had to invent the revolving door since the stack effect airflow pressure prevented opening ground floor doors.

How To Reduce the Stack Effect in Your Home

There are several things you can do to reduce the adverse effects of the stack effect in your home. A big one is reducing the number and size of openings for airflow throughout your home. As the example demonstrated above, cut the opening in half and the airflow drops by half. Here are several options.

- Seal wall cracks and openings, including around windows and even wall outlets.
- Add attic insulation and consider replacing compressed or damaged attic insulation.
- Install crawl space insulation and consider encapsulation.
- Add basement insulation, making sure to repair cracks and add any waterproofing needed before installing insulation.
- Install a basement or crawl space dehumidifier to help reduce moisture and prevent mold and mildew growth.

We Can Help

To learn more about protecting your home from damage caused by the stack effect, contact Groundworks, the nation's leading foundation solutions company. Schedule a free inspection and repair estimate today with a local Groundworks basement waterproofing and repair specialist near you.

Schedule Free Inspection