

The Comfort Corner

Building Science, pt. 1: Air Flow

Note - This article is the first in a series on the Principles of Building Science

If **Uncontrolled** Air is the enemy to comfortable, efficient and healthy homes, what causes air to flow in and around a home?

First, some basic facts about air. Air always moves from high pressure areas to low pressure areas. One of the main tenets of high school chemistry is that nature will always seek to create equilibrium. Hot air rises and cool air falls. If one cubic foot of air leaves a building, one cubic foot must enter the building. This is something to think about the next time the dryer is running - do you know where the replacement air is coming from in your house? The next fact is that air will always seek the path of least resistance. And air will carry things like pollutants and moisture with it.

With this introduction behind us, let us get to the forces behind air pressure. The first is **wind**, a subject that we are familiar with here in Kansas. Wind can create positive pressure build up on the side of a building that is being blown against, while creating a negative pressure area



on the opposite side. Then, the building will take in air on the positive side, while losing air on the negative side. The amount of holes and effectiveness of air sealing measures will dictate how much air is moved where.

The second force to discuss is **heat**, which moves air by a process called **Stack Pressure** inside buildings. Temperature differences between the outside and the inside of a building create pressure on the building. In cold weather, for instance, the hot air on the inside will try to force its way up and out through the roof - an effect that is magnified by additional stories in the structure.

Fans, the third force, can create pressure differences inside a home as well. Leaky building envelopes or ducts, or an imbalance between supply and return ducts can dramatically alter the building's performance and the comfort and health of the occupants.

So, why dedicate advertising space to discussing basics of building and building science? Helping you reduce risk and increase tolerance in any given home is part of our mission. And this brief introduction only scratches the surface of building science. Next month - Heat Flow