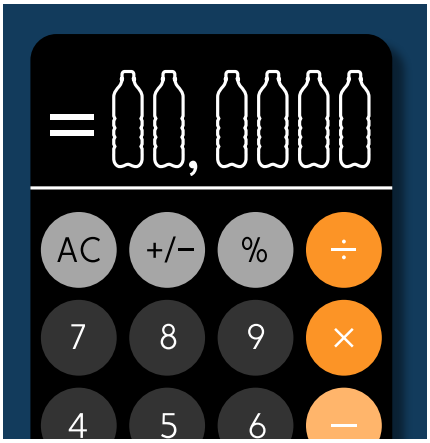
THE BAIT AND SWITCH OF AIR LEAKAGE CONTROL IN BUILDINGS

BY RYAN DALGLEISH, CHIEF OPERATING OFFICER, ABAA



Due to our harsh winter climates, builders in Northern Climates have a special appreciation of insulation, air barriers, high performance windows and other tools to ensure an effective building envelope. We usually do not have a say in it, as mother nature reminds us each winter that living in this climate can be a bit harsh. It's a dry cold right?

It has been said many times that people build energy efficient buildings, not for the money saved each year, but the other benefits of a draft free environment, the reduction in the risk of mold, being able to live comfortably and not be freezing when you get down to very cold temperatures. Saving some money each month ends up just being the icing on the cake. Local electricity prices can be pretty low and so can natural gas, so it has been hard to transform building owners to move to more efficient buildings – there is just not the driving force, other than the building code.

During these cold snaps, condensation issues can arise due to the holes that we were provided, free of charge, by the subtrade working on the envelope. These unintended holes have the ability to transport a significant amount of moisture through the wall assembly via the mechanism of air leakage. The question has become, how much?

I can tell you that owners care about moisture issues more than anything else. This tends to be one of the largest insurance claims in the building industry – water ingress, mold, mildew and rot.

So, can we make a case to building owners to save money on energy, provide a more comfortable indoor environment and be more sustainable by scaring them that they if don't, they can have moisture problems?

WELL, HELP HAS ARRIVED!

A research program funded by the U.S. Department of Energy (US DOE) and Air Barrier Association of America (ABAA) was conducted by Oak Ridge National Laboratories (ORNL) and the National Institute of Science and Technology (NIST). Together, they developed a free tool to assess the impact that a reduction in how leaky a building is will have on moisture movement through the building envelope.

This tool will help quantify both energy savings and moisture transport for a variety of locations across both the U.S. and Canada.

The tool allows for a variety of architectural types and is a very straight forward online calculator to use. With just a few user inputs, you can create a report to help make a case for a more airtight building to save money, energy, carbon output and deal with water. It can be used for both new construction and retrofit construction. Most older building stock is quite "leaky" and would benefit the most from undertaking strategic air sealing.
So, let's take a look at a scenario for a cold climate and what this could mean:

Building Type: Secondary School
Size / floor: One-story with a fairly large square footage footprint of around 210,900 sq.ft
Typical Base Case of Air Leakage:
1.07 cfm/ft2 @ 1.57 psf
Better than Energy Code Air Leakage Target:
0.25 cfm/ft2 @ 1.57 psf
Energy Savings (electricity and gas):
$31,000 per year
Reduction in Moisture Transfer Due to Air Leakage:
2.38 gal/ft2/year (converts to 9 litres)

That is a hole lotta moisture! (see my pun?)

Doing simulations in other cities will show that the energy savings in real dollars will change, depending on the harshness of the climate, but the reduction in moisture transport is pretty close in the majority of cases.

SO, THE MORAL OF THE STORY IS:

If you want to convince an owner to design a more energy efficient building, bring about 5 bottles of pop with you to the meeting and say "imagine pouring this soda into every square foot of building envelope area each year".

I will bet you they will ask for an energy efficient building.

The old bait and switch and they will not even realize it.

To try out this free online calculator, go to:

https://www.airbarrier.org/technical-information/energy-savings-and-moisture-transport-calculator/