

PAPER TITLE

An Airtight Shell for Effective Ducts

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ABSTRACT

Certainly ductwork can be made airtight and these airtight ducts would be more efficient than leaking ductwork. The expected gaskets, sealants and tape, correct dimensions, proper materials and installation procedures are all mentioned in literature, instructions, bid packages and specifications. The difference between what is expected and the realities of a job-site are the gaps that leak air and energy.

HVAC systems are made not by robots in a factory or laboratory environment, but are often pieced together in the wind and rain late Friday afternoon with little or no supervision or inspection. It would be safe to assume the ducts will leak.

Tracing leaks is expensive and time consuming even with the latest in smoke, light and sound detecting methods and remedying these leaks is even more expensive in spite of remote controlled spray cans of sealant equipped with IR cameras.

At some point in the future it may be worth measuring, tracing and repairing these leaks in ductwork to maximize an efficient HVAC system.

In the meantime the elephant in the room is the airtightness of the building envelope, the most important aspect of the HVAC system, and until the building envelope is airtight for the duration of the life of the building, duct leaks are no more than a distraction.

A leaking building envelope is like a camera body that leaks light, nothing that goes on inside will be as important as fixing the leak. What causes these leaks will be addressed in this paper as well as some ideas on how to minimise them.

Leaks take place at points of differential pressure, where air flows from high pressure to low pressure. Weather or atmospheric conditions create pressures and blower motors in HVAC systems create pressures. These two forces must be separated by an airtight building envelope for the accurate measurements the HVAC system relies on to remain efficient and high performing.

More on how a leaking building envelope affects the performance of the HVAC system will be addressed in this paper.

“We have not because we ask not”. We will look at new ideas on what constitutes an air-barrier, what it should be tested to and how it affects the ductwork in an energy efficient future.