DUCT LEAKAGE BASICS

Studies indicate that duct leakage can account for as much as 25% of total house energy loss, and in many cases has a greater impact on energy use than air infiltration through the building shell. In many light commercial buildings, duct leakage is often the single largest cause of performance and comfort problems.

Here are just a few of the problems resulting from duct leakage:

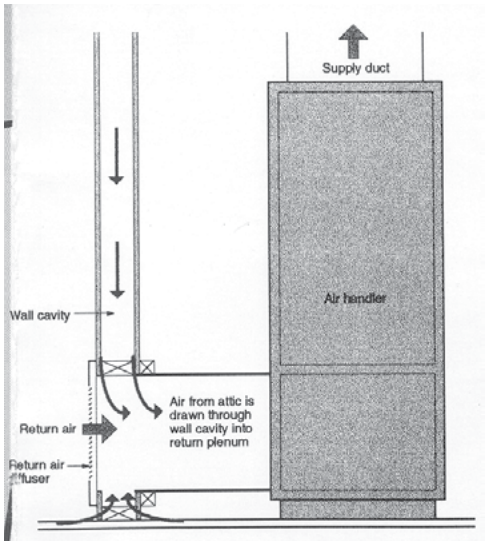
- Leaks in the supply ductwork cause expensive conditioned air to be dumped directly outside or in the attic or crawlspace rather than delivered to the building.
- Leaks in the return ductwork pull unconditioned air directly into the HVAC system reducing both efficiency and capacity. For example, if 10% of the return air for an air conditioning system is pulled from a hot attic, system efficiency and capacity are often reduced by as much as 30%.
- In humid climates, moist air being drawn into return leaks can overwhelm the dehumidification capacity of air conditioning system causing buildings to feel clammy even when the system is operating.
- Duct leakage greatly increases the use of electric strip heaters in heat pumps during the heating season.
- Leaks in return ductwork draw air into the building from crawlspaces, garages and attics bringing with it dust, mold spores, insulation fibers and other contaminants.

Because the air leaking from ductwork is invisible, most duct leaks go unnoticed by homeowners and HVAC contractors. In addition, ducts are often installed in difficult to reach spots like attics and crawlspaces, or are "buried" inside building cavities making them even more difficult to find. And the hard to find leaks are usually the most important leaks to fix, because they are connected to a hot attic or humid crawlspace.

Common Duct Leakage Problems

Return Leak Through Wall Cavity

Supply Leak at Take-Off Connection



Duct leaks can be caused by a variety of installation and equipment failures including:

- Poorly fitting joints and seams in the ductwork.
- Disconnected or partially disconnected boot connections.
- Holes in duct runs.
- Use of improperly sealed building cavities for supply or return ducts.
- “Platform” return plenums which are connected to unsealed building cavities.
- Poor connections between room registers and register boots.
- Poorly fitting air handler doors, filter doors and air handler cabinets.
- Failed taped joints.

The impact on a particular building will depend on the size of the duct leak, the location of the duct leak and whether or not the leak is connected to the outside.

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