

## **“Duct, duct lose”**

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Most midtown homes have forced air heating and cooling (i.e. air conditioning, AC) systems (the “H” and the “AC” in “HVAC”). This means that air is “forced” (i.e. blown by a fan called an air handler) through ducts or other conduit (even empty wall cavities in many midtown homes-including mine!) from the furnace or AC coil to the rest of the house. Equally important are return ducts, or duct that carries air, forced by pressure gradients, back to the furnace or AC coil to be heated or cooled again.

The ducts, termed ductwork, can be the source of significant energy loss. Gaps, holes, poor connections, can lead to conditioned air (air that is either heated in the winter or cooled in the summer) being loss in the basement, walls, or attic space and not making it to its designed location. This leads to hot/cold rooms, room-to-room pressure imbalances, and even poor indoor air quality.

If you suspect you ducts are leaky, the first step is to have the duct leakage measured. All energy evaluators and most HVAC contractors can perform this task. The ducts are pressurized to 25 Pascals and the air leakage is quantitatively measured in cubic feet per minute (CFM). More importantly, the energy evaluator can determine approximately where the ducts are leaky most and if it's economical to repair.

The first step to sealing ductwork is to ensure that each seam accessible is mechanically secured together by at least 3, #8 sheet-metal screws for metal ducts or compression straps for flex ducts. Then, liberally apply a product called mastic at every seam and edge. Mastic is a gooey, non-hardening material with a consistency between mayonnaise and smooth peanut butter. Apply mastic with a paint brush, putty knife or even with your gloved finger. Gaps in ductwork or plenums that are over 1/16 or 1/8 inch wide can be sealed with mastic as long as the gap is first reinforced with fiberglass mesh tape. If you're using mastic to seal seams in fiberglass board ductwork, use fiberglass mesh tape for all joints. Mastic, available at most hardware stores, is nontoxic, but messy, so wear old clothes and proper protective clothing, and don't use it on the furnace or air handler.

However, if most of your duct leakage occurs behind walls and other inaccessible location, the next approach is to use a new product called aroeseal. Aroeseal is a new, patented technology where sticky vinyl polymer particles are blown through the duct system and the polymer particles stick to the edge of a duct opening or leak, then to each other as the hole or gap is filled. This technique has been confirmed by several independent studies (visit our website at [www.transductiontechnologies.com](http://www.transductiontechnologies.com) for copies of these studies) to seal better than 50% compared to other techniques. However, the price is approximately \$1200-\$2000 for your average sized midtown home.