

## 10 Tips To Make Your Home More Comfortable and Cut Utility Bills

Do you have . . .

- Hot or cold rooms?
- High utility bills?
- Air that is too dry or too humid?

The good news is there's a lot you can do to achieve a cleaner, healthier, more comfortable and more affordable indoor living environment. Some are do-it-yourself projects, others are best implemented by trained professionals. This report will get you started in the right direction.

However, since every home is different, not all of the suggestions here will be applicable in your home. "*A Prescription, Without An Examination and Diagnosis, Is Malpractice.*" At Comfort Institute, we encourage homeowners to consult with a local Comfort Institute HVAC contractor member to accurately diagnose the true causes of problems in your home. For more information on the unique *Home & Duct Performance Test* service, view the video on your member's website, or give them a call.

### Six New Solutions To Hot and Cold Spots

Industry studies consistently find that over 50% of homes have at least one room that is too hot or too cold when the rest of the house is comfortable. Summertime comfort problems are very common, such as individual rooms, or even entire floors, that are just too hot and stuffy. Many say their home seems muggy, especially early in the morning, or on rainy days, and the only way they can be comfortable is by turning the thermostat way down.

In many northern, basement style houses it is common to find large summertime variations in temperature from

the frigid basement to the stifling top bedroom floor ... a spread of 15 degrees is common (65° in the basement and 80° in the bedrooms). In winter, cold spots and cold drafts are common complaints.

Many people mistakenly assume that uneven temperatures are unavoidable, since every home they ever lived in had the problem. Others say they can understand why they have the problem, since the problem area is the farthest from the furnace or air handler.

*You don't have to put up with these problems.* New government, industry and utility company research on the causes of uneven temperatures has been performed in the last few years, and the results are clear: there are economical permanent solutions that virtually eliminate large room to room variations in temperature. Here are some common causes, and solutions:

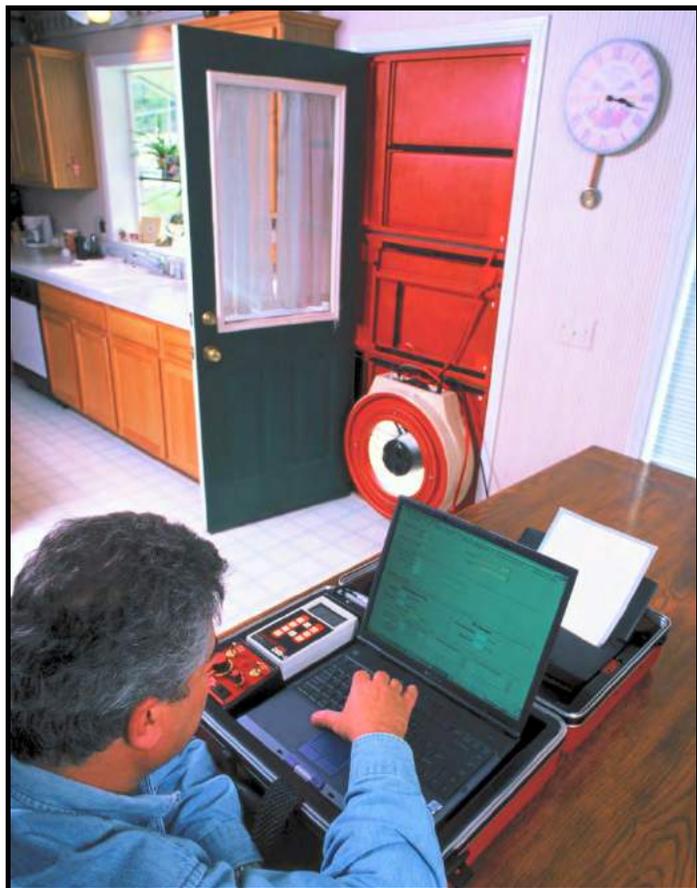
**Identify Your Duct Leaks and Have Them Sealed:** The Department Of Energy states that the typical duct system loses an astounding 25% to 40% of the energy put out by the central furnace, heat pump or air conditioner. In addition to putting a strain on your monthly budget, this energy waste causes discomfort. If the conditioned air is leaking out of the ducts, it is not getting to where it's needed.

To determine if your duct system leaks, and how badly, ask your HVAC contractor for an Infiltrometer blower door test. This is a new computerized diagnostic instrument, invented by the Department Of Energy, that measures air leakage. The test is something like an X Ray or MRI for your home that finds hidden leaks. It sets up in an outside doorway, and creates a temporary pressure similar to a 15 mile per hour wind on all sides of your home. It typically takes an hour to perform. The result is an exact measurement of the home and duct system air-tightness. The precise location of the leaks are pinpointed.

The Infiltrometer test instrument has been featured in National Geographic magazine, Popular Science, and on This Old House and other TV shows. Many heating and air conditioning contractors offer the test as part of a

**“Home and Duct Performance Test”** that also checks insulation levels and overall duct system performance.

If your ducts are leaking, the answer is to have them thoroughly sealed, using special paint-on fiber-reinforced elastomeric sealants, not duct tape. Simply sealing duct leaks usually makes a dramatic improvement in evening out temperatures – and pays for itself through lower utility bills.



**The Infiltrometer test pinpoints air leaks in your house and duct system**

**Have Your Duct System Tested and Air Balanced:** Very few duct systems were properly engineered or adjusted when the home was built. The “engineer” was usually the lowest paid worker of the lowest bid heating and cooling contractor the builder could find. Retain your CI Member contractor to check the “static pressure” in your ducts. Just as with blood pressure, the pressure in your air ducts must not be too high. Renovations to the duct system may be needed to add balancing dampers and eliminate restrictions.

Also ask your contractor to perform what is called a heating and cooling load calculation. This determines the correct amount of cool or warm air that should be delivered out of every register. Factors like room size, height, amount of windows, insulation and air infiltration rates are

taken into account. Once this is done your contractor can use a diagnostic instrument called an air flow capture hood to measure and adjust each register to the proper air flow. Booster fans may be needed in some cases.

**Make Sure You Have Returns In Every Room:** While almost every room has a supply register, many do not have return air grilles. This would not be a problem if we never shut any of our doors, but let’s face it, we cannot live that way. Shutting a door to a room that has a supply vent but no return is like blowing air into a coke bottle. The pressure in the room builds up. This cuts down on the amount of air that can get into the room that we are trying to heat or cool. It also redirects more air into the main part of the house where the thermostat is located. This causes the equipment to shut off too quickly, before the problem area is made comfortable. Your Consultant will check to see if this is happening in your home. Adding new return ducts or transfer grilles can make a huge difference.

**Correct Missing Insulation and Thermal Bypasses:** Proper air flow is only part of the challenge. Insulation also plays a key role in making each room comfortable. In many homes, the insulation is simply not doing its job. Missing insulation or not enough insulation is very common. This is especially a problem with rooms adjacent to attics, or over garages. As part of a Home and Duct Performance Test, your contractor will inspect insulation levels and also check for Thermal Bypasses (hollow wall cavities in the home behind sheet rock walls). While hard to detect from below, these bypasses are like having doors or windows open all year round. Insulation over the top of them does little to reduce heat transfer. Having these bypasses pinpointed and sealed saves energy and makes individual rooms much more comfortable.

**Consider A Zoning Damper System:** After implementing the above recommendations, if the temperatures are still not even enough, or seem to vary over the course of the day, ask your contractor for a proposal for a zoning system. Motorized dampers are installed in the ducts, tied to thermostats in all areas. If one area needs more cooling or heating, the dampers to it stay open and others close off.

**Consider A SMALLER Furnace Or Air Conditioner:** Many homeowners (and most contractors) assume that if there are uneven temperature problems, a larger unit is needed. In fact, the exact opposite is true. If your current system is oversized, it comes on, runs for only a short period and then shuts off. The blast of heating or cooling from an oversized unit typically satisfies the thermostat before the farthest reaches of the home are heated or cooled. A properly sized unit runs gently for longer periods, resulting in more even temperatures, much greater summertime humidity removal, and lower utility bills.

If your system is over 10 years old, and turns out to be oversized, comfort will improve if you install a new

smaller high efficiency unit. Ask your contractor about new variable speed fans and two speed furnaces and air conditioners that adjust their output as needed to extend the run times. Although a new unit is a big investment, done properly the comfort levels will greatly improve, and lower utility bills will pay for it over time.

## **Four Tips To Cut Your Winter Heating and Summer Cooling Bills and Save Money**

**Implement The Recommendations To Improve Comfort and Indoor Air Quality:** Almost all the previous recommendations in this report will also reduce your utility bills. The first step is to have your contractor perform a Home & Duct Performance Test to find out what your priorities should be.

**Install A Programmable Set-Back Thermostat:** Turning down the thermostat 8 degrees for eight hours a day will save 8-10 percent on heating/cooling costs. An easy way to take advantage of these savings is to lower the thermostat temperature while away from home or sleeping. Ask your contractor about new models which are much easier to program.

**Have Your Heating and Cooling Equipment Cleaned and Checked:** A pre-season tune up and filter change (both winter & summer) is a good investment. It reduces the chances of breakdowns in the middle of winter, improves safety, and pays for itself through more energy efficient operation. Maintaining your heating and cooling equipment is no different than maintaining your automobile, except that we often use our heating and cooling equipment much more.

**Consider Replacing Your Old Furnace, AC Or Heat Pump:** Just like a car, heating and cooling equipment doesn't last forever. If your system is over 12 years old, and you are planning to stay in your home more than a few years, many authorities recommend considering replacing it before it fails permanently. A new system is safer, more dependable, more comfortable, and can pay for itself through energy savings as they are up to twice as energy efficient.