

Get your ducts in a row

Winter is a good time to focus indoors for efficiency

Winter is a good time to tackle indoor efficiency projects, such as taking care of your ducts — those big hoses that distribute conditioned air throughout your house. They may be out of sight, out of mind, but unless yours is a brand-new house, it's very likely you're losing conditioned air through faulty ducts. In fact, you may lose as much as 20 percent of the air in the ducts because of leaks, holes and poor connections, according to Energy Star.

How do you know your ducts are losing air? Here are some clues:

- High winter and summer utility bills
- Rooms difficult to heat and cool
- Stuffiness that never seems to feel comfortable
- Ducts in unconditioned attics, crawl spaces and garages
- Tangled or kinked flexible ducts

You can hire a duct specialist or do simple repairs yourself. First, fix the ones that will make the biggest difference. Seal those that are easy to see and get to. They run through the attic, crawl space, unheated basement or garage. Use duct sealant (mastic) or metal-backed (foil) tape to seal the seams and duct joints, including between the furnace and ducts; between registers and floor, wall or ceiling; and between duct sections. Also seal ducts accessible in the heated part of the house.

Don't use duct tape for sealing, as it will dry out and fall off. There are UL-approved products in the market that will do the job of sealing and not dry out. UL-listed foil tape and water-based duct sealant are good options.

After sealing, wrap the ducts in insulation, usually fiberglass, all the way around the ducts to avoid gaps. Also insulate hot water or steam pipes at the same time.

For more on ducts and a brochure, "Duct Sealing," go to ENERGY STAR at http://www.energystar.gov/index.cfm?c=home_improvement.hm_improvement_ducts. The Missouri Department of Natural Resources at <http://www.dnr.mo.gov/energy/residential/ducts.htm> also offers useful information.

Ducts: to clean or not

Should you clean your ducts? The U.S. Environmental Protection Agency (EPA) estimates the air in your home could be up to 70 times more polluted than what you breathe as you drive to work. Dirty ducts could contribute to that pollution.

EPA also points out that even a tenth of an inch of dust buildup on a heating coil can reduce performance by 21



furnace.jpg

percent.

So, cleaning ducts may make for a healthier interior environment, and cleaning and repairing ducts should improve efficiency. Whether you or a provider does the cleaning, here are two cautions:

Don't let service personnel use a chemical biocide (considered a pesticide) or ozone on the inside of the ducts to kill bacteria and mold. According to EPA, no products are currently registered by the agency as biocides for use on fiberglass duct board or fiberglass lined ducts.

There's not much research to demonstrate the effectiveness of most biocides and ozone, and they may cause negative health reactions in occupants.

EPA does register some products for use on the inside of bare sheet metal air ducts as sanitizers on hard surfaces, which could include the interior of bare sheet metal ducts. However, if the directions call for rinsing with water, clearly you can't use them inside ducts, where moisture could stimulate mold growth.

EPA recommends you ask the service provider to show evidence of microbial growth in the ducts and to explain why such cannot be removed by brushing or controlling moisture.

Beware of sealants for ducts as well. EPA and other organizations do not recommend the use of sealants to encapsulate contaminants in any type of duct. Sealants may not even completely coat the ducts. They can affect the fire-retarding characteristics of the duct fiberglass, and they may contain toxic ingredients.

At www.epa.gov/iaq/pubs/airduct.html, EPA offers guidance on what to expect from a professional duct cleaner and a post-cleaning checklist.

Doug Rye on ducts

Doug Rye, who consults with electric cooperatives on energy efficiency, says ducts are the second biggest energy problem in home construction after air infiltration. Ducts are energy wasters in four ways: location, sizing and design, tightness and type.

Location – Rye recommends placing ducts in conditioned space, such as in a slab or in a crawl space or basement, thereby saving 20 percent energy use over traditional placement in the attic. He says, "Why would you want to place ducts carrying conditioned air in the hottest part of your house in summer and the coldest in winter?"

Sizing and design – Many homes have larger heating and cooling systems than they need, leading to wasted energy use. According to Rye, oversized systems often are installed to compensate for duct problems. If you stop duct leakage, you can downsize the heating/cooling unit, resulting in a more comfortable home environment and lower energy bills.

Tightness – Rye says the average house he tests has at least 300 cubic feet per minute (CFM) of air leakage, most from the ducts. In fact, some homes have more than 1,000 CFM leakage. One hundred large kitchen garbage bags would hold



furnace work.jpg

about 300 CF of conditioned air leaving your house every minute, largely because of leaky ducts. Repairing those leaks should produce immediate energy savings and a more comfortable home.

Type – Rye recommends sheet metal ducts for basements, crawl spaces and attics but not for slabs, where they will rust. Metal ducts offer low resistance to air flow but have many connections, joints and seams that must be sealed. Black Max is a type of plastic ductwork he recommends solely for installation in or under concrete.

Rye doesn't recommend ductboard and flexduct because of their poor durability. Ductboard is made from stiff, high-density sheets of fiberglass with foil facing on one side. Flexduct, made with a plastic inner liner inside a tube of insulation

covered with a vinyl vapor barrier, can be easily damaged and has a higher resistance to air flow. Visit www.dougyre.com for more tips on improving your energy efficiency.

Insulate your ducts to improve efficiency

Don't stop with sealing leaky ducts. Insulating them, especially if they're in unconditioned attics, crawl spaces, garages and basements, can result in even greater efficiencies.

According to the U.S. Department of Energy's Energy Savers, ducts are typically made of thin metal materials that easily conduct heat. Through conduction, uninsulated or poorly insulated ducts in unconditioned spaces can lose through conduction 10 percent to 30 percent of the energy used to heat and cool your home. The heating and cooling equipment then has to compensate for the heat loss and gain by conditioning additional air. This added conditioning raises your electric bill. In addition, when ducts lose heat through conduction, rooms served by long duct runs can experience "cold blow" during the winter because they usually have lower heating-supply temperatures.

Ducts in conditioned spaces experience minimal conductive losses and gains since they are exposed to indoor air temperatures. However, these ducts also may require some insulation to prevent condensation on duct walls and to ensure that conditioned air is delivered at the desired temperature.

To insulate your ducts, hire an experienced heating, ventilation and air-conditioning contractor. Typically, such contractors use rigid fiber board made of fiberglass or mineral

wool to insulate. They impale the insulation on weld pins and secure them with speed clips or washers. Unfaced boards can be finished with reinforced insulating cement, canvas or weatherproof mastic.

Note: Be sure to update your “expert” in this story!

Stay Safe and Warm in Snow and Ice Storms

Power outages due to snow and ice storms are especially threatening because of extreme cold temperatures. After a snow or ice storm, avoid going outside if possible. Downed power lines could be hidden under snow and ice, making them difficult to identify. When outside, treat all downed and hanging lines as if they are energized. Stay away, warn others to stay away and immediately contact your electric co-op. Remember that downed power lines do NOT have to be arcing, sparking or moving to be “live” — and deadly.

When the power is out because of a snow or ice storm, Safe Electricity suggests these tips to help you stay safe and warm:

- Stay inside and dress in warm, layered clothing.
- Close off unneeded rooms.
- When using an alternative heat source, follow operating instructions, use fire safeguards and be sure to properly ventilate. Always keep a multipurpose, dry-chemical fire extinguisher nearby and know how to use it.
- Stuff towels and rags underneath doors to keep the heat in.
- Cover windows at night.
- Keep a close eye on the temperature in your home.

Infants and people over the age of 65 are more susceptible to the cold. You may want to stay with friends or relatives or go to a shelter if you can't keep your home warm.

Use caution with backup generators

You may be one of the millions of homeowners with a backup generator for use when electric service is interrupted, but do you really know how to operate it safely? Unsafe operation can threaten the operator, their family, neighbors and even the linemen working to restore power. Moreover, unsafe installation or operation may result in a lawsuit and your insurance may not cover your liability.

Your generator may be portable, which can service some lights and small appliances that are connected with a heavy duty extension cord. They should not be connected to the circuit breaker or fuse box, and should only be operated while they are outside a home. Or you may have a permanently installed generator, which was wired into your home by a qualified electrician, using a transfer switch. Such a device isolates your home from the neighborhood power lines and prevents any electricity from feeding backward into the overhead lines.

“Safety for the operators and users of a generating system in the home and utility crews cannot be over-emphasized,” says electrical inspector Mike Ashenfelter (OR YOUR EXPERT HERE). He says the lack of a transfer switch on a permanent

generator — or wiring a portable generator into a circuit box — can injure linemen working to restore power or neighbors who might be walking near a downed line.

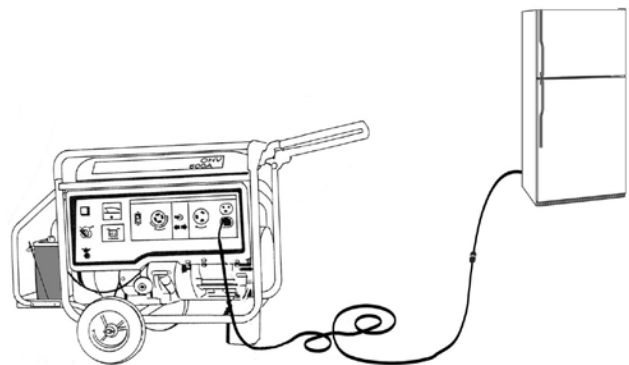
Ashenfelter (OR YOUR EXPERT HERE) encourages safe operation of generators to protect the family that is benefiting from the technology. Make sure you understand how the generator works and how to properly ground it to prevent electric shock. Operate it only outside to prevent toxic and potentially deadly exhaust from entering a home. And he adds that before refueling it, allow the engine to cool, to prevent a fire should the gas tank overflow.

When starting a generator, disconnect all appliances that might be connected to it. That will not only protect them, but also prevent a fuse from being blown on the generator. Connect the extension cord and turn on the lights or appliances individually. A portable generator will unlikely be capable of powering an electric range, a furnace, a refrigerator or a freezer. Its potential power surge may also damage a well pump if it is connected to it.

Children and pets may be curious about the generator, but should be kept at a distance to avoid hot engine parts or the chance for electric shock. Portable generators are only for temporary use, but they can be a helpful tool if used properly and priorities are established for their capacity.

Only properly rated extension cords should be connected to a generator. They should have a three-prong plug capable for grounding and the insulation should be intact. When the generator is no longer needed, it should be shut down, allowed to cool and serviced for the next time it is needed.

For more electrical safety information, visit www.SafeElectricity.org.



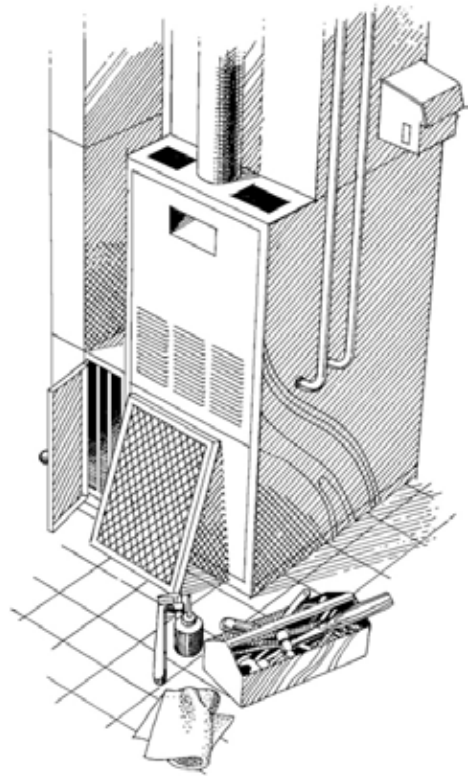
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2012

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Energy Efficiency

Tip of the Month

Televisions, satellite dish receivers and DVD players often use electricity even when they are turned off. If you can live with the inconvenience of having to wait a little longer for these devices to come on, you can reduce your electric bill by unplugging them when not in use.

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Doug Rye says . . .

'Happy' summer comfort

I decided to splurge and take my wife to a lodge at one of our great state parks to help ring in the New Year. It is difficult for me to stay up much past the late news, but I can do it if I am in good company and if someone will give me a green New Year's hat and a silly little horn.

There was only one place to eat, and it was the nice restaurant at the lodge. By the time you have been there for two full days and eaten six straight meals with the same people, you begin to feel like family. In this case, it was super nice.

On New Year's morning, I left our room and went to the room with the big fireplace and the big view to get some coffee. As I stepped into the hallway, a lady housekeeper with a vacuum cleaner looked at me and said, "Hey, I just read your article in the electric cooperative magazine last night." I said, "Then you must know about the little bitty bedroom that I had as a child." And sure enough, she did.

She told me about her childhood, sisters and brothers, and a house with only a small wood heater for the winter. Then she said, "But we were all happy." Several others have commented on the article with their stories, and all of them have mentioned that they were happy even though their house did not have all the comforts that we have today. At that time, I had not yet made a New Year's resolution, but I heard the word happy so many times and I was wishing everyone a Happy New Year, so I made my 2012 resolution. I will be happy regardless of the circumstances.

Although I am not convinced that it is necessary to have total temperature comfort for one to be happy, I am convinced that everyone would like to have comfort. In this and next month's column, I am going to teach you everything I know about temperature comfort in your house.

The first thing to know is that not everyone has the same comfort temperature. Some like it hotter and some like it colder. Based on the calls that I get at the office, I would say that a husband and wife rarely agree on which temperature is best.

One lady told me, in a kidding tone, that her husband was more worried about his cattle being comfortable than her. That was on a day when it was snowing over most of the state. Comfort is usually related to both the air temperature and the relative humidity. Generally speaking, folks are the most comfortable if the temperature is about 74 degrees with a relative humidity of about 50 percent. Remember that relative

humidity is the percentage of moisture in the air compared to the most moisture that the air could hold at a certain temperature. Let's start with some summer comfort tips.

I have never had a person tell me that their house was too dry in the summer. Let's take a day in Arkansas when the temperature is 90 degrees. If the relative humidity is 70 percent, you will feel sticky hot because the moisture on the skin cannot evaporate and cool the body. So you turn on your AC unit. An AC unit cools by removing heat and humidity. As the humidity is lowered, the skin moisture evaporates and you feel cooler.

That same 90-degree day in Arizona with 50 percent relative humidity would be like going to heaven because the skin moisture evaporates easily. So that 90-degree air at 50 percent is much dryer than the 90-degree air at 70 percent. If it were raining on a 90-degree day, the relative humidity would be right at 100 percent in either state. How can we relate this to your house for better comfort? Well if it is a hot 90-degree/70-percent humidity day and your house has lots of air infiltration, leakage in the return air system, unvented bath areas or anything making moisture, the air-conditioning unit will have to work harder and longer to keep you in the comfort range.

If your air-conditioning unit is oversized, it will not run long enough to remove the humidity, so you will probably lower the thermostat setting to make the unit run longer. All of this means higher utility bills. The solution is to caulk, repair ductwork, vent bathrooms, etc., and then purchase a properly sized air-conditioning unit when needed. This really isn't complicated if you take it one step at a time. So I suggest that you let this much absorb and not evaporate, and next month we will discuss winter comfort tips.

Until then, BE HAPPY.

Doug Rye, a licensed architect living in Saline County, Ark., and the popular host of the "Home Remedies" radio show, works as a consultant for the Electric Cooperatives of Arkansas to promote energy efficiency to cooperative members. To order Doug's video or ask energy efficiency-related questions, call Doug at 501-653-7931. More energy-efficiency tips, as well as Doug's columns, can also be found at www.ecark.org/energy-efficiency/doug-rye.



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