

Beyond Blocks and Bricks

Number Seven

Ronald J. Hunsicker

Professional Engineer

Masonry Investigations

P. O. Box 6615

Wyomissing, PA 19610-6615

484-332-1164

rjhpe@ptd.net

Saving energy at home

Oil is expensive and natural gas is relatively cheap. Fortunately, my house is heated with gas. Still, the house is a rambling, single-story, 1923-vintage load-bearing masonry building which has all the insulation in the walls that two wythes of clay masonry, furring, and an inch or so of horse hair plaster can provide. It bleeds heat. We reinsulated the attic a few years ago and have storm windows through-out. Heat is hot water and there are six zones and six automatic set-back thermostats. 65 degrees during the day and "Where is the extra quilt?" at night.

Since I would like to save some more \$\$\$ but I really (really) hate incense, the cheap test method is out. I do, however, like gadgets, so I picked up one of the thermal leak detectors. Bad idea. Now I know the truth. I think that I'm going to change the thermostats to 60 during the day and buy a few more quilts.

Checking of windows, doors, electrical outlets and switches, and ceiling lights with the leak detector suggests that infiltration is under pretty good control.

Reinforcing how much energy leaks through the 90-year-old walls, the interior temperatures of the windows are not all that different than that of the surrounding walls. There are no easy solutions to this leakage. The only options appear to be applying EIFS to the exterior walls (Garden State Brick Face, where are you?) or lifting all the wooden trim, applying board insulation to the walls, installing gypsum board, and then resetting the trim. I don't like either option, so it is off to the quilt store!

Preventing Heat From Sneaking Out of the House

Tony Cenicola/The New York Times

January 13, 2011

LITTLE known fact: your house breathes. A typical home is supposed to exhale about 33 percent of its air every hour, sparing your lungs from mold, dust and other tiny

invaders. My house doesn't breathe. It hyperventilates. Every hour it purges about 75 percent of its air — which is fine for my family's health, but it kills me to think that we pay to heat that air and then quickly set it free. I'll explain the source of that 75 percent figure a little later. Right now let's focus on the basic mission: finding where the air is escaping, plugging those holes and watching the heating bill shrink.

Job No. 1 — locating the leaks — was a challenge. My home has foam insulation, fiberglass insulation, insulated windows, weatherstripping and enough caulk to seal a ship. How exactly does 75 percent of my air escape every hour? I posed the question to three residential energy specialists, and in the process learned some tricks — a few of which will also help apartment dwellers, who usually have no worries about foundation cracks or attic insulation.

My panel included Kelly Parker, a board member of the Residential Energy Services Network, an association of firms that rate home energy efficiency; Michael David, lead technician for New England Conservation Services, which performs energy audits and upgrades; and Bob Gfeller, a senior vice president at Lowe's.

Finding a leak is easy, they said. Get a blower door, which depressurizes a house so that even the tiniest drafts blow like a stiff wind. They cost a mere \$2,900. Second choice: a Black & Decker laser thermal leak detector (\$42, at Lowe's), which will identify the cold spots that coincide with leaks.

The most cost-effective sleuthing device, though, is even cheaper and may already be in your home — a stick of incense. Pick a breezy day and pass the burning stick near any seam in your house, and the smoke will reveal where the leak is. I took a lighted incense stick around my doors and windows, and the technique worked fairly well, even if I grew completely sick of the smell after a while. But Mr. David and his colleagues later found that I'd missed some spots I hadn't even thought to check, like the seam between my fireplace and the wall, and my baseboard heaters.

My two biggest omissions were the attic and the basement. "If your attic access is inside the house, that's a big one to watch for," Mr. Parker said. "If it's not well sealed, it's like leaving a big door open." At some point in the last few years, I lost a bolt that secured one of the two big springs in my drop-down attic ladder, leaving one corner sagging about a half-inch from the ceiling. I never considered the effect that sag might have on my budget until I envisioned air streaming through the gap.

As for the basement, "Check the places where all your piping is coming and going," Mr. Gfeller said. "Sometimes things happen, like your house might settle, and it'll open a pretty good-sized crack." To spot those leaks, try this: Go to the basement in the daytime, but keep the lights turned off. Depending on the angle of the sun, you may detect cracks from the daylight shining through the foundation.

For me, this exercise actually solved two mysteries. The pipes to my outside water spigots apparently travel through holes big enough to accommodate much airflow — and many mice. (Stay tuned for a column on rodent removal.) Basement doors are another area of vulnerability, since people often pay little attention to how well they're

constructed or maintained. In my case, the frame was surrounded with gaps that had probably been there the entire decade we've lived in the house.

If you have a fireplace, don't even bother checking it. "They all leak," Mr. David said. "Even if you have the flue closed." Doesn't my fancy hearth cover help? "Nope," he said. "Those all leak, too."

Last, a word to those with central air or central heat: try the incense trick around the seams of the ductwork. Even a small gap can allow costly leaks. *(Check the furnace bonnet, supply runs and return runs. If the space between floor joists is a duct space, seal the joint between the tin and the wood. All this is very important; put the warm (winter) and cold (summer) air where you want it! I did this in a house a few years ago and a bedroom at the end of a duct run that never got warm became very comfortable. Buy the best duct tape you can find. rjh)*

Now on to Job No. 2 — plugging the leaks. You'll need to spend some cash — except in one area, that is. Every place I've ever lived has had a front door draft, and just about every front door nowadays has a threshold with three big screws. But those screws don't simply keep the threshold in place. Turn them counterclockwise and the threshold rises, closing out the source of a nagging draft. When the weather turns warm and humid, you can reverse the process if the door is too tight to close. Thus ends the cost-free portion of this process. If your doorway lacks adjustable thresholds, install a rubber door sweep (about \$7 at Home Depot).

Weatherstripping, is also a must, for doors and windows. Mr. Gfeller prefers stripping of various thicknesses (the labels say whether they're designed for doorways or windows); Frost King's cost about \$4 to \$7 a package. Mr. David prefers V-shaped stripping (about \$4 from Frost King); this type, he said, breaks down less easily than foam. If you have an unheated section of basement, be sure the door to that section is firmly sealed — unlike mine, which has a hole for a cat door cut into it. (We plan to install the door pronto.)

To seal molding and window frames, Mr. David said, steer clear of \$2, all-purpose caulk and buy long-lasting 100 percent silicone caulk (General Electric's is about \$8 a tube). For bigger holes, he said, like those around baseboard heater pipes, use Great Stuff (about \$4 to \$6 for 12 ounces), an expanding, foam spray insulation. This step isn't necessary for people with central heating systems, but they may face bigger challenges. If the system's air ducts are leaky, Mr. Parker said, the best solution is to budget about 20 hours to apply a liquid seal to the seams. (He recommended Mastic, about \$25 a gallon.) Otherwise, he said, contractors will charge \$300 to \$500 for the job.

Speaking of bigger projects, my attic had about 6 inches of old fiberglass insulation, which is roughly half what it should be for a home in Connecticut. (The federal government's energy Web site, energystar.gov, has insulation recommendations.) R-30 insulation (about \$13.50 for a 31.25-square-foot roll at Lowe's) brought my attic to the top of the site's recommended levels.

What about those leaky fireplaces? It might help to fill the chimney with an inflatable plug (about \$50 at Home Depot).

Mr. Gfeller recommended electric outlet sealers, which are essentially gaskets, for other often-drafty spots: switch plates and outlet covers. The sealers cost around \$2 for a package of four.

Finally, my panelists agreed on the value of a programmable thermostat — so you can lower the heat at night, during vacations or at other opportune times. “As long as you really use it,” Mr. Parker cautioned, noting that many people who buy the devices never program them. A Honeywell model offers one-week programming and costs \$80. Now back to the question of how I learned how much air my home exhales. It was simple. I called my electric company, Connecticut Light & Power. Like many public utilities, mine will send an independent contractor to your home for an energy audit. My cost was \$75. For my audit, Mr. David and two colleagues arrived at 9 a.m. and spent two hours finding all the leaks I’d missed. They used a blower door, not incense, and it was with the blower that they calculated my home’s hourly exhalation rate of 75 percent. Then the team spent about two hours caulking and sealing the remaining leaks, all included in the \$75 price. Most utility-sponsored energy audits won’t include this second step. Some charge more, some less. But even at a higher price, and without the additional work, it would have been worth the expert diagnosis. By the time Mr. David and his colleagues departed, my home’s air expulsion rate had dropped from 75 percent per hour to around 40 percent per hour, likely saving me around \$160 in heating oil annually, Mr. David said, and the house feels less drafty. His team — again, at no extra charge — also installed a shower head, \$100 worth of low-energy light bulbs and other items that will likely drop my electric bill by around \$150 per year.

Of course, if you are not inclined to call in experts, you can always try the incense. Just do your sinuses a favor, and use the variety pack.