

Truly Affordable Comfort

A reasonably priced national conference on residential energy conservation will be held November 29–December 1, 1988 in Pittsburgh, Penn. The third annual Affordable Comfort Conference is “dedicated to networking by design rather than by accident,” according to the Linda Wigington, the conference organizer. More than 80 energy professionals will present concurrent workshops on the following topics: diagnostic approaches, health and safety, client/customer education, mobilizing resources, state and local models, mobile homes, multi-family buildings, market research, quantifying results and benefits, and integrated solutions to housing and energy.

The conference will bring together many different actors in the field of home energy conservation, including practitioners, managers, and decision makers from utilities, non-profit agencies, private sector firms, consumer organizations, and educational, research and governmental organizations. The advance registration fee is \$145. Early birds can sign on for just \$125 before September 9. For additional information contact Linda Wigington, ACTION-Housing, Inc., Two Gateway Center, Pittsburgh, PA 15222. Tel: (412) 391-1958.

Houses Losing Their Coolth

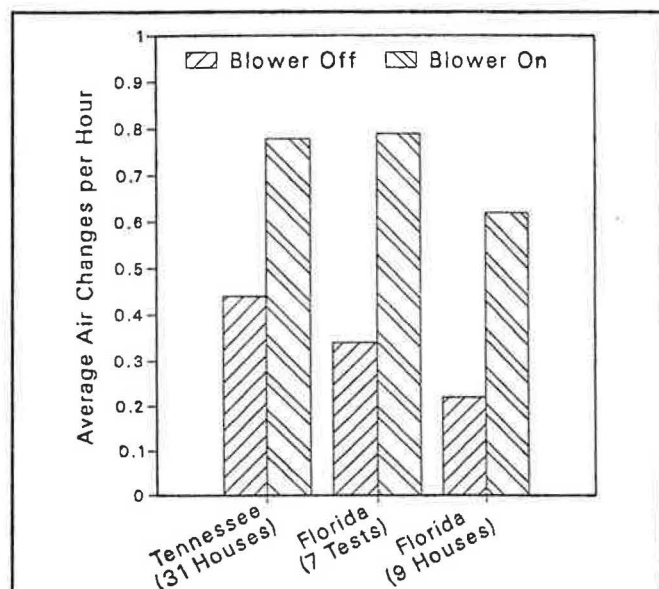
Would you be surprised if 25 percent of the supply or return air in an air-conditioning system were actually leaking out through the delivery ducts? Pioneering work by researchers at the Florida Solar Energy Center has found such to be the case in a large number of recently constructed Florida houses.

Using special tracer gases to measure air infiltration, a research team led by James Cummings has found that infiltration rates can easily double or triple after the air-conditioner blower fan is turned on. In a set of nine test houses, the average air exchange rate with the blower turned off was 0.22 air changes per hour (ACH). When the blowers were switched on (thus allowing some inside air to leak through the ducts into the attic and crawlspace), the average air exchange rate jumped to 0.62 ACH. These

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results compare favorably to earlier tests conducted by Cummings at a villa in Florida and by R.B. Gammage on 31 Tennessee homes (see figure).

Cummings also found that closing interior doors can increase the rate at which outside air enters the home.



Air infiltration rate with the air-conditioner blower on and off in three sets of field tests. A consistent amount of cooled air is being lost through the air delivery system into unheated sections of the house (e.g., the attic and crawlspace). The Florida studies were conducted by Cummings and the Tennessee study was conducted by Gammage.

Most of the houses he tested had one return air grille at a central location. The cooled or heated air was delivered to individual rooms through supply registers. When a door to a room is closed, according to Cummings, the pressure in the room becomes higher compared to other areas of the house, since air is being forced into the room through the supply register and the closed door prevents air from exiting to the return air grille. The rest of the house is under a slightly negative pressure relative to this room. The pressure difference induces infiltration of outside air. The effect is exacerbated as more interior doors are closed.

Cummings compared the infiltration rates in two houses with the blower on. After closing all the interior doors, he found average infiltration rates increased by 0.45 and 0.70 ACH compared to when the doors were open.

Cummings and his associates are finding that substantial air leakage through cooling ducts is a common problem, even in many newly built homes. “The leaks on many of these systems are totally hidden to the average contractor and homeowner,” he says. “If there were a four-by-four-foot hole in the wall, a homeowner would recognize it and fix it right away. Yet quite often there are leaks worse than this in cooling ducts that the occupant can’t even see.”

There is no one simple solution, according to Cummings. “Often, supply leaks may occur at the grille where the duct is attached, if this has not been sealed properly. In some cases, where a hall closet serves as an air handler,

there is drywall missing (covered by a baseboard) at the bottom of the closet. In one such house we tested, the closet was drawing 25 percent of the return air from the attic. The owner couldn't cool the house below 82°F on a hot summer afternoon. After a couple of hours of work using board insulation and foam sealant, we reduced the infiltration rate in the house from 1.15 to 0.3 ACH!"

References

Cummings, J.B. "Central Air Conditioner Impact Upon Infiltration Rates in Florida Homes." Florida Solar Energy Society. Presented at the 1988 meeting of the American Solar Energy Society. June 1988.

Gammage, R.B. et al. "Parameters Affecting Air Infiltration and Airtightness in Thirty-one East Tennessee Homes. In Trechsel, Lagus, Eds, Measured Air Leakage of Buildings. ASTM STP904. August 1986.

Training Contractors in North Carolina

Blower doors, smokesticks, and infrared cameras are high-tech devices that can increase the quality of construction and retrofit work and serve as useful marketing tools. They are expensive items, however, and require hands-on training in order to be used effectively. To encourage the proper use of these tools by the building and remodeling community, the North Carolina Alternative Energy Corporation is sponsoring a set of workshops beginning in September, called "Energy Diagnostic Information and Training." The rate-payer-funded, non-profit group's mandate is to promote "economically and socially sensible" alternative energy systems.

One-day workshops will describe the economic advantages of offering diagnostic services and are intended to whet the contractor's appetites to learn more. At the same time, vendors will display available products. Two-day hands-on workshops will follow, allowing those interested in applying the technologies to learn specific skills, said Project Manager Frank Vigil.

NCAEC plans to offer the program to contractors specializing in insulation, HVAC, and home improvement. The need is acute because conservation technologies have not been widely accepted in North Carolina. Vigil noted that "few contractors in North Carolina are familiar with energy diagnostic tools like blower doors."

After each of the North Carolina workshops, participants will evaluate the program. Then, twelve months later, the whole program will be evaluated to see if the builders have adopted the techniques and if services provided have been up to snuff. In program planning, as well as in retrofitting, as Vigil says, "It's not what you expect, it's what you inspect that's important."

Canadian building scientist Joe Lstiburek and blower door manufacturer Gary Nelson will be teach the workshops. Lstiburek plans to describe his renowned airtight drywall approach to weatherization of new buildings, but insists it is not the most important technique he has to teach and hopes to present an overview of moisture and durability issues in energy-efficient housing. He'll ask such provocative questions as "why do radon mitigation strategies often save the occupants but kill the house?" and answer them with workable strategies for avoiding moisture problems. ■



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