

too, is difficult for similar reasons. Besides, in a house that's tight enough to need an air-to-air heat exchanger, the furnace will be off much of the time. In that case, it's time to flip things around and piggyback your heating system on-to your air-to-air heat exchanger (see the description of the Vent-Aire system in last month's *Progressive Builder* section).

Airflow

Not all fans are created equal, but all fans move less air as more ductwork is added. Each fan has a unique performance curve, which describes how much air it moves at a given "static pressure" — the resistance caused by ductwork. Make sure the fan can deliver the cfm you need through the ductwork you plan to install. The static pressure can be estimated by an HVAC contractor, or you can learn the procedure yourself. One source of information is a publication called "Residential Heating and Ventilation System Design" available from the Heating, Refrigeration, and Air Conditioning Institute of Canada (5468 Dundas St. W., Suite 226, Islington, Ontario M9B 6E3 Canada).

In general, when selecting a ventilation system or exhaust fan, look for a relatively flat fan-performance curve. That means that the fan doesn't wimp out as soon as you add a few feet of duct. Choose smooth ducts, short runs, and avoid sharp or too many turns. In many cases, installers are not getting the airflows they expected because they used cheap fans and/or poor ducting design.

Control

There are two schools of thought on control: one says to give it to the client; the other says make it automatic. The best option, I think, is to do both—make it automatic, but with simple manual overrides. The control system should be simple to understand and operate, and should guarantee adequate ventilation.

The most common automatic controls are clock timers and dehumidistats. I like dehumidistats, because they respond to changing ventilation needs. They are not foolproof, however. In very dry climates, they may underventilate; in wet climates or in swing seasons, they may overventilate. So you must educate your client a bit on the necessary tinkering.

Timer switches and fan/light switches work well in baths. For the kitchen exhaust, a good old-fashioned on/off switch may be best. Most owners want some direct control over a ventilation system.

Some designers advocate running the ventilation system constantly at low speed and speeding it up when needed—usually for kitchen or bath use. This is fine, if it's quiet, sized correctly, and doesn't cause discomfort with noise, drafts, or fumes from cars or a neighbor's woodstove. In many cases, however, homeowners have reacted to constantly-on systems by shutting them permanently off. I'd rather have the system on only when needed—when people are home, generating moisture and pollutants.

**If the system is
simple, quiet, and
comfortable, the
homeowner will use
it—otherwise he will
undermine it.**

Whatever the control system, give the owner some control over the ventilation rate. Calculated rates are only approximations. And even if they are accurate, conditions change over time.

The homeowner

If the average homeowner won't clean his gutters, drain the sludge from his hot water tank, or change the filters in his furnace, what makes you think he's going to muck around with the innards of his ventilation system? A house designed to operate like a finely tuned race car will usually be out of tune.

If the ventilation system is noisy, cold, smelly, or troublesome, the owner is going to undermine it no matter what the control strategy. He will turn up the humidistat till the machine shuts down, or find the service panel and hit the breaker.

On the other hand, I believe that the owners hold some responsibility for the maintenance of their home and the conditions of their indoor environment.

The reasonable course is to give the owners the most reliable and easy-to-operate system you can, and supply them with a simple, clearly written manual for maintaining and operating the system—and the rest of the house, too. You will be helping them take care of what may be the largest investment of their lives. You may also be giving yourself some legal protection in case a disgruntled owner comes after you some day with an ambulance-chaser.