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YOUR HOME; Giving Air An Air of Cleanliness

By JAY ROMANO

FOR some people, spring means washing windows, scrubbing floors, discarding junk, hosing down lawn furniture and airing out the house. But spring is also a good time to air out the air.

"Most people are oblivious to the fact that indoor air is often loaded with contaminants," said David Johnston, president of What's Working, a consultant to the construction industry based in Boulder, Colo. "Even in the cleanest houses there are microparticulates floating around, like animal dander, unburned hydrocarbons, pollen, mold spores, bacteria and even dust-mite feces."

Mr. Johnston, who specializes in environmentally friendly construction, said that in addition to those things, most houses have at least some airborne gases.

"There's formaldehyde, volatile organic compounds and all sorts of petroleum derivatives," he said, explaining that such exotic-sounding gases come from the most ordinary sources: adhesives, cleaning products, solvents, paints, particle board, furniture, carpeting, nail polish remover and even shirts and suits just back from the dry cleaners.

And then, he said, there are substances tracked in from the outside: pesticides, herbicides and whatever else might be attached to the bottoms of shoes.

Accordingly, Mr. Johnston said, one of the most significant ways to reduce exposure to airborne contaminants is to improve air quality in the homes. "There are some obvious first steps," he said, "like having a good doormat, or, better yet, taking your shoes off before entering the house."

In addition, he said, it is usually prudent to hang clothes just back from the cleaners outside the house with the plastic bags removed. "That lets the cleaning fluid left in the clothes evaporate," he said.

It is also wise, he said, to use a spring cleanup to get rid of old cleaning products, paints, solvents and other chemicals typically stored and long forgotten under sinks and in cabinets.

Such steps, of course, are aimed at removing the obvious sources of indoor air pollution. There are also some less-obvious sources of airborne pollutants.

"You wouldn't believe what we find in some ductwork," said Steve Wolfson, president of Environmental Cleaning Systems, a duct cleaning company in Valley Stream, N.Y. "We've gone into some houses and taken out a couple of pounds of debris."

Mr. Wolfson said that in houses with central heat and air-conditioning systems that use ductwork to distribute air throughout the house, the homeowner must regularly change the system's air filter. In most cases, however, homeowners use relatively inexpensive filters that are found in home centers.

"They pick up maybe 15 percent of the contaminants passing through them," Mr. Wolfson said. "The rest ends up as debris in the ducts or comes right out the other end." Debris in ductwork, he said, can become a breeding ground for mold and mildew and other bacterial contaminants.

The solution, Mr. Wolfson said, is to have the ducts professionally cleaned and install a filter that will prevent them from getting dirty again. A professional duct-cleaning company, he said, will typically use a rotating brush on a hose attached to a vacuum unit with a high-efficiency filter vented outside the house.

"While the brush is rotating the debris is being vacuumed out and none of the bad air comes back into the home," he said, adding that cleaning the ductwork in an average two- or three-bedroom house would cost around \$150. For about \$50 more,

he said, duct-cleaning companies will also treat the inside of the cleaned ductwork with an anti-bacterial spray to kill any mold or mildew left behind.

The best way to keep clean ducts clean, Mr. Wolfson said, is to let only clean air inside. And that can best be accomplished, he said, by investing in an electrostatic filter. Such filters use an electrical charge to trap particulate contaminants on the filter surface. And rather than replacing them every month -- the average life span of ordinary filters -- electrostatic filters can be cleaned with a garden hose and then reinstalled.

"They should last a lifetime," Mr. Wolfson said, adding that there is a price to be paid for quality: cardboard filters cost about \$2, compared to \$70 to \$100 for a high-quality electrostatic filter.

Alex Wilson, publisher of Environmental Building News, said that another way homeowners can reduce airborne contaminants indoors is to eliminate the sources.

"There's all kinds of junk living in our houses," Mr. Wilson said, explaining that most indoor-air-quality experts recommend using area rugs -- or better yet, leaving floors bare -- instead of installing wall-to-wall carpeting. Newer carpets can emit chemical gases, he said, adding that most carpets sold today carry emission information on their labels.

But even old emissionless carpets can provide a hiding place for all sorts of tiny biological nasties. "A major portion of the problem with indoor air pollution is antigenic material," said Dr. Terry Gordon, an associate professor of environmental medicine at the New York University School of Medicine in Tuxedo, N.Y. "What we're finding now is that cockroaches and dust mites might be contributing to a lot of asthma."

Dr. Gordon explained that while roaches and dust mites are themselves too heavy to become airborne, their "digestive by-products" are light enough to become suspended in the air.

As a result, he said, people who live in areas where roaches are a problem should do everything possible to eliminate the source of the infestation and to get carpeting, bedding and upholstered furniture as clean as possible. It might also be worth the investment, Dr. Gordon said, to purchase a high-quality room air cleaner that can scrub both solid contaminants and harmful gases from the air.

Bruce Berriman, president of Berriman Associates, a commercial air-cleaning product distributor based in the Briarwood section of Queens, said that consumers should do their homework before buying an air cleaner. "There are two basic kinds of air-cleaning machines," he said: "passive and active."

Passive air cleaners, Mr. Berriman said, generally draw air through the machine, where the air is filtered to remove the pollutants and then ejected back into the room. Active air cleaners -- typically called negative ion generators -- emit electrically-charged particles that become attached to the pollutants, which then fall to the floor.

"There are pluses and minuses to each," Mr. Berriman said, explaining that the most important thing consumers need to know when purchasing a stand-alone air cleaner is that different tests are used to rate different machines.

A passive air cleaner that is rated as 90 percent efficient using the Atmospheric Dust Spot procedure, he said, would only achieve an efficiency rating of 60 percent using what is known as the DOP test, a method named after an abbreviation for the substance dioctylphthalate, which is used in the test because it evaporates to produce particles that are all exactly 0.3 microns in size.

And while both testing methods are valid, he said, consumers should read labels carefully when comparing the efficiency of different models to make sure that the same testing procedure was used.

Generally speaking, Mr. Berriman said, consumers should look for an air cleaner that can produce about six full air changes an hour using a high efficiency particulate arresting filter.

Mr. Berriman said that homeowners who want a passive air cleaner should look for one that can produce six full air changes an hour using a High Efficiency Particulate Arresting (HEPA) filter, which is 99.97 percent effective in removing particles as small as 0.3 microns in size.

Those in the market for an active air cleaner -- or negative ion generator -- should find one that does not produce ozone as a by-product, because of health concerns associated with that substance.

In either case, he said, a machine that would adequately filter a 400-square-foot room with an eight-foot ceiling would cost

about \$400. (The formula for calculating the size of the machine needed for a given area can be found on Mr. Berriman's Web site at www.berriman-usa.com)

Drawing. (Tom Bloom)