The Dirt on Furnace Filters

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Q How often should I change the furnace filter? My furnace guy says every month. What do you think?

A The answer is a lot more complex than you might imagine.

For decades, many heating experts recommended changing, or at least inspecting, furnace filters monthly. The filters at that time, like those that still come standard on many furnaces, were generally inch-thick fiberglass pads with so much space between fibers that you could almost see through to the other side. These filters do virtually nothing to stop the tiny particles that cause lung damage, but they are effective at blocking larger particles that could harm the furnace. "We call them 'sticks and stones filters,' " says Robert Moffitt, a spokesman for the American Lung Association's Health House program, which aims to help people build and maintain homes that don't trigger asthma attacks and other health problems.

Today, though, there are other options. The Health House program, which is sponsored by 3M, recommends high-efficiency pleated filters with a built-in electrostatic charge. Filtrete (made by — surprise! — 3M) is the best-known brand of these filters, which look like felt pressed into a zigzag pattern. The folds add significantly to the filter's surface area, so a similar amount of air can flow through even though the filter medium is a much finer sieve. In laboratory tests, these filters remove up to 90 percent of mold spores and pet dander, which are in the range of 3 to 10 microns. (A human hair, by comparison, is about 70 microns in diameter.) The electrostatic charge, which is similar to the static cling in clothing fresh from a dryer, works like a magnet to grab even smaller particles, such as bacteria, the particles that carry viruses, and the soot in smoke and smog. These particles, under 3 microns, lodge deep in the lungs and cause the most health problems.

Manufacturers typically recommend that the high-efficiency filters be changed every three months. The Health House program adds a suggestion to look at the filters monthly. "If filters are obviously dark and clogged, go ahead and replace them," Moffitt says. "Not everyone's house and habits are the same. If you have three or four cats, or if someone in your house smokes, you should change the filter more often."

Based on all of this, the advice seems simple enough: Buy a better filter, look at it monthly and plan to change it every three months, or every season if you have a combination heating and air-conditioning system that runs year-round. However, here's where it gets more complicated. If you do switch to higher-efficiency filters, you really need to follow through in changing them regularly. And there are significant reasons why you might stick with the less-efficient filters, even if good air quality matters to you.

With the old-style filters, if you forget to change the filter after a month, it's really no big deal. The dirt trapped on the fibers actually increases the filter's ability to block small particles, and plenty of air still gets through for the furnace to run relatively efficiently. The newer filters, however, significantly restrict air flow once they become somewhat clogged. This prevents your furnace from moving as much air as it was designed to do, which causes it to run longer to heat your house, which in turn adds to your gas or electric bill, according to Alan Veeck, executive director of the National Air Filtration Association, a trade group that represents filter manufacturers. So, not only are you paying more for the better filters (perhaps $15 to $20 each, compared with $1 to $2 for the flimsy kind), you also could end up paying several hundred dollars a year more in heating costs.

The Canada Mortgage and Housing Corporation, the Canadian government agency that researches housing issues and provides financing, reached some surprising conclusions several years ago when it set out to determine whether upgrading to a better filter made much of a difference in the air quality inside houses. Researchers compared the air quality inside houses when furnaces ran with five different filtering arrangements, including old-fashioned filters; newer pleated, electrostatically charged filters; and electrostatic precipitators that cost hundreds of dollars. Particle counters installed in ducts before and after the filters showed that cleaner air flowed out of the better filters. But the actual difference inside the houses? Very little.

It turns out that most of the dust, of all particle sizes, in the air in our houses becomes airborne because of our activities. When people walk across a dirty carpet, their feet stir up a cloud of dust. When someone leaves toast in the toaster too long, bits of soot go into the air. Even getting out of bed stirs up a "personal cloud," says Don Fugler, who directed the research. A furnace filter many yards away, connected to equipment that operates only periodically, doesn't do much to remove that dust before it settles. That's why a vacuum cleaner bag, which does pick up settled dust, collects far more dust over one to three months than you will find on your furnace filter when you change it after an equivalent length of time. "Unless the fan runs all the time, you're getting very little filtration for the extra money you are spending," Fugler says.

Running the fan continuously allows the filter to remove more particles, but it adds to the power cost by at least several hundred dollars a year, and it subjects people to moving air all of the time, which many people find unpleasant.

Fugler's advice? Focus on reducing the amount of dust that is stirred up inside your house by encouraging everyone to leave their shoes at the door; keeping pets and smokers out of the house; vacuuming regularly and thoroughly with a central vacuum system or a portable vacuum equipped with a HEPA (high-efficiency particulate air) filter; and "using as effective a furnace filter as the homeowner's budget allows," changing or cleaning the filter as often as the manufacturer recommends.

In his own house, Fugler uses the washable filter that came with the furnace. "It's just mesh, not very fine," Fugler says. "I vacuum it off every month and put it back in."