



HOMEOWNER TIP

If the quality of the air in your home is important to you, take **SPRING CLEANING** seriously. Once or twice a year, take the time to do a thorough cleaning of your home. Move the furniture, clean the corners and be thorough. If the garage is attached, clean the garage. Keep doormats clean. You can make a big difference in how clean the air is in your home by cleaning.

IN THIS ISSUE

- ✓ IAQ - INDOOR AIR QUALITY
- ✓ COPPER PIPE CRISIS

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IAQ

Indoor air quality - IAQ - how significant is it and should you be concerned? Perhaps more importantly, what can you do about it?

Unfortunately, the air in our homes is some of the dirtiest we breathe, even dirtier than that found along many of our highways. There are many reasons - pets, fabrics that retain dust and debris, plants (a source of pollen) and casual house cleaning, among others. So you probably should be concerned, especially if you or someone in your family has asthma, allergies or other respiratory sensitivities.

Air pollutants can be particulate matter (dust), odors, gases, smoke, viruses or house-dust mites, among others. Chemical or biological contaminants can also be a concern. Some sources are airborne; some are not. Control is difficult, and in some cases, it is impossible or impractical.

Air filtration is one way to improve indoor air quality. Various types of freestanding air filters are enjoying great popularity as many people have decided that they are the answer to improving the air quality in their homes (and cars). But are they the answer? And are they worth the investment?

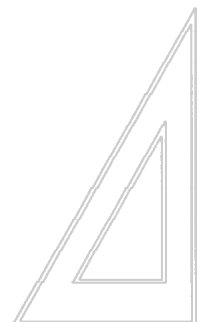
Let's review the basics of air filtration.

First, there are basically two types: central or local filtration. A central system that filters virtually all of the air in your home is generally more effective than a local or freestanding unit. The ability to affect most or all of the air in your home is much higher. Central filtration systems are more effective but also more expensive to install. Such systems are also limited to homes with central heat and/or air-conditioning, since a duct system to circulate the air is needed. Most warm air heating systems do include some central filtration. The filters need to be replaced frequently, and the ductwork should be cleaned regularly for optimum performance. A freestanding unit

(Continued on next page)



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A Practical Approach to
Improving Air Quality...

1. Don't smoke in the house.
2. Maintain good ventilation.
While maximum energy efficiency depends on a tight home, some outside air is important to maintain good air quality.
3. Be sure that cooking equipment is well vented to the outside, and use those fans.
4. Be sure that bathrooms have exhaust fans that vent to the outside, and use them.
5. Don't burn candles, incense or anything in the home. Combustion produces contaminants.
6. Don't use a wood stove, fireplace or space heater.
7. Be a good housekeeper – vacuum and dust regularly and thoroughly.
8. Have your carpets professionally cleaned at least every other year, annually in high-traffic areas.
9. If you have warm air heat, have the equipment serviced regularly and change the filters frequently.
10. Have the ductwork for your heating, air-conditioning and exhaust fans cleaned at least once every three years, more frequently if you have family members who are especially sensitive to airborne contaminants.

can affect only a small, local volume of air, which will then mix with the other air in your home.

Second, there are two primary methods of filtration. You can clean the air either mechanically, by filters that trap particles, or electronically, by systems that attract particles on electrically charged plates.

Mechanical filtration results vary according to the quality and condition of the filter. The most effective are HEPA (high efficiency particulate arrestant) filters. They are also the most expensive. All filters need to be replaced on a regular basis to maintain optimum air cleaning effectiveness.

The effectiveness of electronic filtration depends on the quality of the unit, as well as the volume of air it can process, and proper maintenance. Some electronic units produce ozone, which is considered by many experts to be an air pollutant that can cause respiratory problems.

Even the best air cleaning devices cannot ensure good air quality. They will not affect pollutants such as gases or viruses. They will have only limited effect on airborne particulate matter, depending on the quality of the filter and how well it is maintained. They will not affect dust mites or similar material that is not airborne.

So, should you buy or install an air filtration system? If someone in your family suffers from asthma or allergies, the answer may be yes. But realize that you will not be producing pure, contaminant-free air, only improving it. If no one is suffering from asthma or allergies or if you just want to take a more practical approach to improving the air quality in your home, the list to the left includes some things you can do that don't involve buying and maintaining new, often expensive, appliances or equipment.

If you can't say "I am doing that" or "I will do that" to a majority of the items in the list on the left, buying one of the popular "air cleaners" is not going to do much for you. At best, you will be dealing with the symptom more than the cause and, even then, with only limited effectiveness.

Here are a few useful references:

1. Consumer Reports (10/03) - "Air Cleaners: Behind the Hype."
2. A detailed summary of air cleaning devices can be found at www.epa.gov/iaq/pubs/residair.html.
3. Association of Home Appliance Manufacturers (AHAM) has a voluntary certification program for room air cleaners. For more information, visit www.cadr.org/consumer/certified.html.

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Copper Pipe Crisis

In summary, the air in our homes is dirty. And, if that is important to you, there is a lot you can do before spending money on a new device that probably will not live up to the manufacturer's claims.

Recently, copper pipe, which is widely used in plumbing systems, has been the target of many complaints regarding unexpected and premature deterioration, often leading to leaks.

There are those who point to some changes in water quality regulations in the early 1990s as the cause. One theory suggests that the higher-quality water no longer encourages the development of a thin, protective film (patina) on the inside of the pipe and that without that film, the pipe is more vulnerable to corrosion. That seems to be a simple explanation, perhaps too simple. To check that theory, we consulted with experienced people in the public water industry. This is what we found out.

First, as suspected, that theory oversimplifies what is a very complex subject, and one that is not fully understood. The premature deterioration appears to have many causes that are site-specific, often related to installation conditions, chemistry and bacteriology.

It is true that many water utilities have improved their water by adding chemicals to reduce lead and copper corrosion. That has demonstrably lowered levels of both contaminants in public water supplies. It is not clear, however, whether those changes have had any direct effect on the deterioration of copper piping.

Everyone seems to agree that corrosion in copper piping appears to be escalating. From all available evidence, the causes are diverse. High levels of chlorine and stagnant water are two causes of copper corrosion that can work together to accelerate deterioration. Stagnant water with low oxygen and high bacterial content is known to cause copper corrosion. And inactive plumbing systems are vulnerable.

Also, for complete disinfection, it has become much more common to super chlorinate new water mains and new copper service pipes at the time of installation. However, if the high levels of chlorine stay stagnant in copper plumbing because they are not immediately flushed and put into service, then the chlorine sets up an ongoing corrosive reaction that is very difficult to eliminate.

Similarly, stagnant water in plumbing in new and old buildings can develop corrosion cells due to bacterial action. This has been noted especially in copper lines feeding water coolers and icemakers on refrigerators that may

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get very little use during certain seasons. Blue or black water in ice cubes is a symptom of this problem.

Another cause for copper pipe deterioration is electrolysis, which typically affects pipes buried underground. Depending on soil conditions and proximity to electrical power lines, very small electrical current can flow through the pipes. As it does, the current gradually carries the copper in the pipe away and pinhole leaks develop. As the leaks saturate the ground around the pipe, the electrolysis accelerates, as does the loss of copper in the pipe.

Some copper erosion is caused by galvanic action (which occurs when dissimilar metals, copper and steel, for example, are joined directly).

Further, during installation, over-fluxing (using a chemical that loosens the oxides from the metal) the joints prior to soldering or using the wrong flux can initiate a corrosion cell near the joint. Because of the acidic nature of flux, it must be promptly flushed away by putting the pipe into service.

So clearly, there are many reasons for copper deterioration. Much technical writing and ongoing research in the United States and the United Kingdom are devoted to understanding the many causes of copper corrosion. In time, these issues will surely be resolved.

In the meantime, what is the solution? Determining the cause comes first. That process should include contacting your local water utility; they may already have some diagnostics and recommended corrective actions.

Once the cause is determined, the solution may be localized and simple. For a widespread problem, replacing the pipe may be necessary. However, that can be quite costly and disruptive. Lining the pipe is an alternative. There are companies that have developed the technology to line pipes as small as 1/2 inch in diameter with epoxy. One such company is Ace Duraflow. For more information, visit their Web site at www.duraflow.com. You should, of course, thoroughly investigate the problem and get more than one opinion before deciding on corrective action, especially if some of the recommendations are from companies that would benefit from your decision. In new construction, choosing nonmetallic pipe for your plumbing system may be wise.

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