

Clean Indoor Air

Tip Sheet #7

## Furnace Filters



Helpful websites:

- Centers for Disease Control and Prevention (CDC): <http://www.cdc.gov>
- Environmental Protection Agency (EPA): <http://www.epa.gov/iaq>
- Consumer Products Safety Commission (CPSC): <http://www.cpsc.gov>
- Alaska Housing Finance Corporation (AHFC): <http://ahfc.state.ak.us/>

Have you ever noticed that no matter how much you clean, you can still see particles floating in a beam of sunlight coming in through a window?

This isn't just dust! It's made up of pollen, plant and mold spores, pet dander, lint, bacteria and other contaminants. Regular daily activities within the home such as dusting, vacuuming, cooking and smoking can increase particulate concentrations. These particles, measured in microns, range in size from fairly large to microscopic. To better understand the size of a micron, note that a human hair is about 70 microns in diameter. The tiniest particles make up 99% of debris in the air circulating within your home. These can bypass the respiratory system's defense mechanisms—such as the nose, sinuses and windpipe—that are designed to filter out particles 3-5 microns in size and keep them from becoming lodged in our lungs. Health effects from breathing these particles can range from irritation of the eyes and/or respiratory tissues to more serious effects, such as decreased lung function and cancer. They can also cause allergic reactions and infectious diseases.

One way to help lower the particle count in your home is to use better furnace filters and change them regularly. Follow manufacturers' instructions on the filter to see how often the filter needs to be replaced or cleaned. Filters are either disposable or reusable and are made from materials such as fiberglass, metal, man-made or natural fibers. Factors that affect filter efficiency include fiber size, fiber density, airflow rate, and particle diameter.

### Types of Filters

- Panel filters, usually 1" fiberglass filters, are the typical furnace filters installed in the duct-work of most home heating and/or air-conditioning systems. These filters do little to remove contaminants from the air. The primary function of these filters is to protect the fan and minimize the amount of dust on the heating and cooling coil. They also can capture large particles from the air. This basic filtering system may be upgraded by using a high-efficiency filter to trap additional pollutants or by adding additional air-cleaning devices.
- Washable/Reusable filters are designed to be washed and reused. They never get completely clean and can therefore become restrictive to air flow. These filters are ineffective at capturing small particles.
- Pleated filters are basically panel filters that have been pleated or folded to provide more surface area. These filters are typically more efficient than a panel filter. By increasing the surface area for collecting particles, however, the flow velocity through the filter is reduced, which decreases the pressure drop across the filter. It is important to change the filter on a regular basis so as not to restrict airflow.
- High Efficiency Pleated filters have an electrostatic charge that is designed to capture small particles and allergens such as dust, pollen, mold, pet dander and smoke. These particles are the particles that make up 99% of your air, can aggravate allergies and asthma, and which contribute toward dust in your air and on your furniture. It is important to change them on a regular basis.



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[www.aklung.org](http://www.aklung.org)

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- High Efficiency Particulate Air (HEPA) filters are extended filters that remove sub-micron particles with high efficiency. HEPA filters consist of a core filter that is folded back and forth over corrugated separators that add strength to the core and form the air passages between the pleats. The filter is composed of very fine sub-micron glass fibers in a matrix of larger fibers. These types of filters are not designed to fit most standard furnaces. They generally need a separate system consisting of a fan and filter.
- Electronic air cleaners use an electrical field to trap charged particles. Like mechanical filters, they can be installed in central heating and/or cooling system ducts. Electronic air cleaners include electrostatic precipitators; ion generators are sometimes classified as an electronic air cleaner. These devices may produce ozone, a lung irritant, as a by-product of use.

An important point to keep in mind when selecting a filter is that efficiency will change over time. As filters become loaded with particles, the available openings for air to flow through become smaller. The result is better filtration but less air movement, causing your furnace to work harder to move air through the system. These filters need to be replaced on a regular basis (follow manufacturers' instructions) to insure proper air flow. As for electronic precipitators, they are most efficient when first installed, and lose their efficiency as they get dirty. Regular maintenance and cleaning is required to keep these operating at peak efficiencies.

*Tips on using a furnace filter:*

- Start by reading the manufacturers' instructions on maintaining your furnace to determine where the filter is located and also how often you should have your furnace inspected by a licensed heating contractor.
- Identify from the instructions the type of filter appropriate for the furnace you have.
- When you purchase your filters, look for the highest-efficiency filter that works with your furnace.
- Replace your filter at the stated intervals, usually about every three months. Replace more often if you are introducing higher levels of particulates into your home, such as when renovations are being done, when using candles, or if someone has been smoking in your house. Also, consider more frequent replacements if you have a family member with asthma, allergies or other lung diseases.



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