

CRAVENS
INSPECTIONS

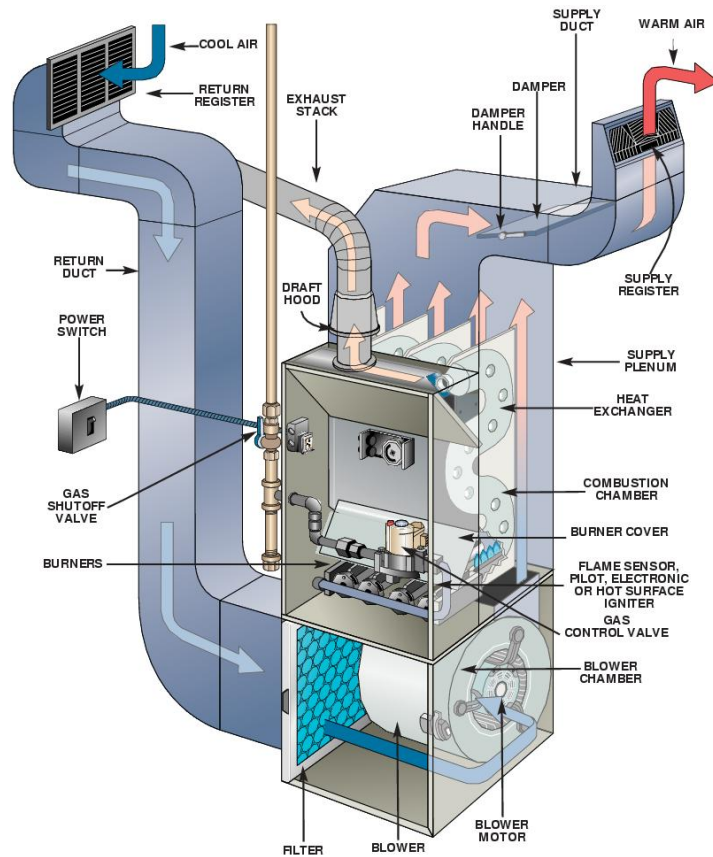
HOME INSPECTION SERVICE

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Charles Cravens - Nationally Registered Home Inspector

MY REPORTS

Furnace Filters



Do you want to destroy your furnace! Do you want to pay higher utility bills? If so then just don't change your air filters!!

A clean furnace filter helps you and your family breathe the cleanest air possible as well as help your HVAC system run more efficiently. The furnace filter is designed to pull a majority of unwanted particles from your indoor air, such as mold spores, pet dander, household dust, smoke, pollen, dust mites and smog. The furnace filter is also designed to allow the correct amount of air flow across your furnaces heat exchanger in order to keep it from overheating. Using the correct filter in your furnace is an easy way to reduce the cost of energy you use; a dirty filter will force your system to work harder to push air through the filter, while a clean one will allow the air travel more freely. The filter also keeps the coils and the heat exchanges in your system clean. If you want to destroy your furnace then don't change the filters!

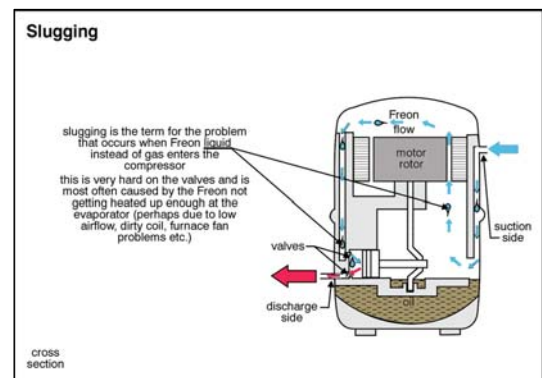
The problem with dirty air filters:

During Winter:

- Will cause reduced air flow into the home.
- Will increase the operating costs.
- Will cause the furnace to discharge higher than normal air temperature.
- Will cause an abnormal temperature rise across the heat exchanger.
- May cause stress cracks in the heat exchanger.
- May cause the blower motor to fail.
- Will decrease system efficiency by increasing the heat-loss of the duct work.
- Allows dirt accumulation on air-conditioning coil.
- Allows dirt accumulation on the blower motor fan.

During Summer:

- Will cause reduced air flow into the home.
- May cause air-conditioning coil to form ice or freeze up completely.
- May lead to "liquid slugging" at the compressor.
- Greatly decreases system efficiency.
- Will increase operating costs.
- Allows dirt accumulation on air-conditioning coil.
- Allows dirt accumulation on the blower motor fan.



When an air filter is dirty, the air flowing across the heat exchanger will be restricted. This will cause the furnace to overheat from the lack of air flow and cause the combustion limit to trip. Restricted air flow will cause the furnace to have to work harder to keep up with heating demand and if a dirty filter is left in for an extended period of time, components will fail prematurely due to excessive cycling. When the heat exchanger overheats failure may also occur in the form of cracks in the heat exchanger or failure of the blower motor. Cracks in the heat exchanger can cause spillage of carbon monoxide into the air stream going into the home.

While more expensive furnace filters trap smaller particles from the air than the less expensive ones there are three disadvantages. First, because of the tight "weave" of the filter, airflow is restricted more than with a coarser, cheaper filter. As air flows, the high-end filter will load up more quickly and you'll have to change it more often. Finally, your heating costs will increase since your blower will be pulling a partial vacuum at the air return because of the filter. This means there will be less airflow to heat your house and your furnace will run longer, each cycle.

Never double up on filters. Do not put one filter in the furnace and one in the return air vent. This restricts the air flow much like a dirty filter and will cause you heat exchanger to over heat.

How to choose the right filter for your furnace

The choice of which filter to buy for your furnace depends on how much you want to spend, what you're trying to filter, and how diligent you are about changing the filter.

The minimum efficiency reporting value (MERV) scale goes from 1 to 16. Most residential filters range from 4 to 12. Furnace manufacturers prefer the traditional spun fiberglass filters (MERV 2) because they filter out enough of the large particles to protect the furnace while providing maximum airflow. Maintaining the furnace manufacturer's specified airflow is critical to achieving energy efficiency and maximum life from the blower motor and heat exchanger. An inexpensive MERV 4 filter captures 80 percent of the particles 50 microns and larger, but only 25 percent of the particles in the 3 to 10 micron range.

For most homeowners, a more expensive MERV 7 or 8 pleated filters provides a good balance between cost and filtration efficiency. These filters trap 80 to 95 percent of the particles 5 microns and larger. High-efficiency filters capture 99 percent of airborne particles as small as 0.3 microns (bacteria and viruses, fumes and pollen). However high efficiency air filters reduce the air flow across your heat exchanger which should be addressed by your HVAC service technician. He may want to increase the fan speed to make the unit more efficient.

Furnace efficiency is one thing. But if you're a clean freak or have family members with allergies or low-immunity issues, spend more on a high-efficiency (MERV 11 and higher) filter. Then just make sure you stay on top of filter changes to protect your furnace.

If you switch from a fiberglass filter to a high-efficiency filter talk to you HVAC technician about the need to boost fan speed to compensate for the reduced air flow. You will have to be diligent about replacing the filter regularly.

Types of Furnace Filters

Fiberglass -Fiberglass air filters are designed only to filter out the largest of debris particles. This allows the small pieces of dirt and dust to pass directly into your furnace. These fiberglass furnace filters have a tendency to clog extremely fast when compared to a pleated furnace filter. Even though they are a cheap initial investment, over time it becomes much more expensive than the more durable pleated furnace filters.

Fiberglass furnace filters cannot filter out many particulates like many forms of mold and bacteria. Fiberglass furnace filters have been reported to increase your monthly heating and cooling costs by as much as 30% when compare to pleated furnace filters.

Electrostatic - Often, electrostatic filters are often permanent, washable filters that carry an electronic charge. This charge attracts dust particles much like a magnet. These filters are normally installed at the furnace. As a home inspector I have observed that when the furnace is installed in the attic these filters tend to have been forgotten and are badly clogged.

Pleated - The pleats in filter media of HVAC filters increase the surface area, and thereby the effectiveness, where particles can be captured. Pleated air filters remove up to 45% of the air pollutants in the home. The filter with more pleats per foot across the face will allow you to have better airflow throughout your home. Stay away from the cheap bargain furnace filters. Instead, opt for pleated high-efficiency air filters with a MERV rating of 8 or higher and at least 10 pleats per foot.

High-efficiency Air Filters - These filters are reported to be the most practical air filters for most residential HVAC systems, removing up to 85% of the air pollutants from your home.

HEPA - Provide the best filtration for your home by removing up to 98% of air pollutants from your home; however they create too much air flow resistance when it comes to furnace filters and the fan speed may need to be increased.

Activated Carbon - An activated carbon component in a furnace filter enables it to absorb chemicals, fumes, and odors as air passes through your HVAC system.

Air Filter Accessibility

An air filter that is installed where it is not readily accessible may in fact be ignored completely by the home owner, and may rarely if ever be serviced.

Be sure to inspect your HVAC system and ductwork thoroughly to be sure that you know where any and all air filters are located. A forgotten air filter will mean poor heating or cooling in the building and higher energy costs. Pay close attention to those filters installed in the attic or high up as they are the most neglected.

In general, disposable furnace filters should be changed once every three months. However, during the winter and summer months when your HVAC system is running often, you may need to change filters more frequently. Similarly, if there's a condition that would make the filters become saturated faster than usual (such as open windows during pollen season, or several pets in the household), you will need to change your filters more frequently.