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## Summertime brings pollen, dust, and smoke into the air. How do I keep these particulates from getting into the house?

A house should manage indoor air quality by regularly exchanging stale “used” indoor air with fresh outdoor air. You can also improve indoor air quality by avoiding unnecessary sources of contamination, such as restricting smoking to outdoors, storing fuels outside, and selecting low-VOC paints and furnishings. But over the course of a year the air in Interior Alaska can contain particulates from wildfires, wood smoke, dust, pollen, car exhaust, and other sources that cause you to shut the windows. That’s where filtration systems can help.

### Air Filtration Options

When it comes to indoor air filtration, the best choice for you depends on many factors, including the size and tightness of your house, your existing ventilation system, your sensitivity, and the amount of particulates and other contaminants in the air. Be aware that irritating and/or harmful particulates don’t just come from outside, but also inside—such as from tobacco smoke, animal dander, mold spores. Another source of contaminants are gasses that come from paints, carpets, cleaners, and other household products. The most common filtration systems are mechanical and target the particulate matter. The price ranges from roughly \$200-\$300 for a one-room portable filter to \$6,000-\$8,000 for an HRV installation with filtration.

### Stand Alone Filtration

The simplest system is a standalone air purifier which contains a fan and filter elements all in one unit and can simply be plugged into the wall. These systems are designed to be portable and recirculate air in a single space, and will reduce pollutants like allergens, pet dander and dust from that space. These work well in homes where air quality problems are isolated to one or two areas.

### Multiple room air cleaners

Air filtration systems that can serve multiple rooms or even the whole house typically cost more and will require an in-line fan and ductwork, but tend to be more effective. Keep in mind that whether large or small, filtration systems by themselves don’t introduce fresh outdoor air, but they can provide air cleaning and heat distribution. Whole house systems may be a good option for those with bad allergies or respiratory problems.

Many homeowners who heat primarily with wood install small circulation systems, with an in-line fan and ductwork in just a few rooms to move heat around the house, says Richard Musick of Ventilation Solutions, LLC. The size of the fan is driven by how much air you want to circulate.

“If it’s only a couple of rooms, you can get away with a 200 cfm (cubic feet per minute) fan. Big houses can require up to 900-1500 cfm,” Musick says.

### Heat Recovery Ventilator (HRV) Filtration

While new HRV systems often have high levels of built-in filtration, older models are generally only equipped with coarse debris filters whose primary purpose is to keep the core and motors clean. To help ensure good air quality, a simple filtration system can be attached separately in line with the warm-side supply port on the HRV. All the HRVs at CCHRC have a prefilter to catch the big particles, a main particle filter to catch small particles, and a carbon filter to remove odors, aerosols and VOCs. These filters can be found at HVAC and hardware stores, and are inexpensive and easy to replace. Note that the carbon filters typically need to be replaced more frequently than the other air filters.

## **Rating**

Filtration systems are measured by a MERV rating—or minimum efficiency reporting value—which goes from 1 (traps bigger particles) to 20 (traps the smallest particles). You pick a MERV rating based on what you're trying to filter. For example, MERV 1-4 will take care of pollen, dust mites, and most animal dander; while you'll need at least MERV 13-16 to filter out smoke particles. HEPA (high efficiency particulate arresting) is the 17-20 range, removing more than 99 percent of tiny particulates such as carbon dust from the air.

Typically MERV 15 represents the upper limit for residential HRV systems as anything finer may restrict too much airflow. The EPA Office of Radiation and Indoor Air notes that filters with MERV ratings between 7 and 13 are capable of reducing unhealthy particulate matter almost as well as HEPA filters. Additionally, activated carbon filters can be used to neutralize smoke and VOCs.

## **Tightness of your house**

Homes built today are more energy efficient with better insulation and higher levels of air tightness than many of the homes built in previous decades. Building codes now require mechanical ventilation systems for all new residential construction in most if not all northern states. This is simply because uncontrolled air leakage can no longer be counted on to provide the fresh air needed to keep a home healthy. Generally speaking, the highest performing ventilation systems available today will include balanced and regulated fresh air exchanges, in combination with air filtration.

No matter what system you get, check to see what type of replacement filters are required. Some models may use proprietary filters that are more expensive to replace or have more limited filtration capacity.

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