

Protecting Your Health After a Wildfire: Cleaning Indoor Air

The Health Impacts of Wildfire Smoke

Wildfires are a major source of hazardous air pollutants, including volatile organic compounds (VOCs), semi-volatile organic compounds (SVOCs), and airborne particles, also known as fine and ultrafine particulate matter (PM).

As a wildfire burns, the particulate matter and chemicals resulting from the combustion of natural vegetation and materials from the built environment form a giant mass of pollutants called a **plume**. Once these pollutants are put into the atmosphere, the plume spreads and evolves over time, causing emissions exposure to occur at different scales. People that live in communities near a wildfire are exposed to pollutants left behind through three primary routes: inhalation, ingestion, and skin exposure. **Inhalation exposure** occurs when residents breathe suspended or resuspended PM, dust, ash, and even volatile chemicals.

PM_{2.5} (particulate matter that is 2.5 microns or less in diameter) is a primary concern because, when inhaled, PM_{2.5} can penetrate deep into the lungs and may even infiltrate the bloodstream. Studies have directly linked PM_{2.5} from wildfires to health issues such as exacerbation of asthma, chronic obstructive pulmonary disease, premature death, and cardiovascular disease, such as heart attacks and strokes.

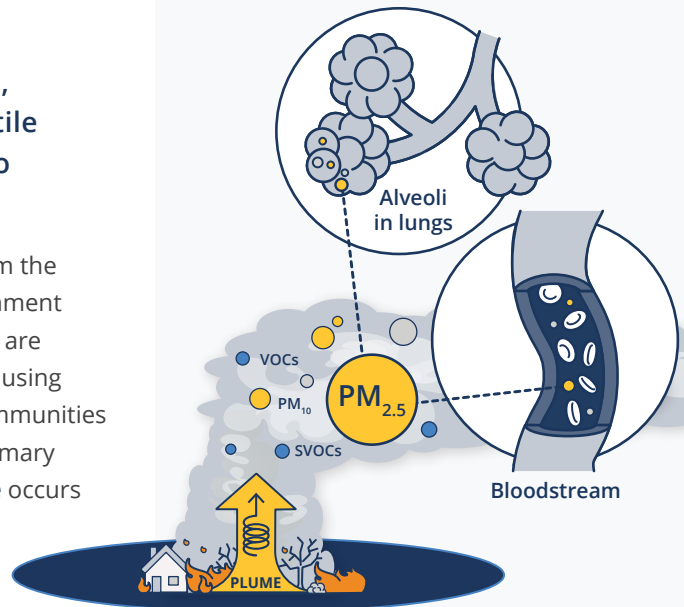
EXPOSURE RISKS

Certain members of the population, such as children, individuals with chronic lung or cardiovascular disease, aged people, pregnant people, those with weakened immune systems, and people with lower socioeconomic status, may be more vulnerable to adverse health effects from wildfire pollutants than others. People in certain occupations may also be at a greater risk, including firefighters, emergency responders, clean-up recovery crews, and outdoor workers, such as farmers and landscapers.

Even in communities downwind from a fire, poor air quality can lead to significant adverse health effects. Therefore, taking necessary precautions to protect your health during and after wildfires is critical.

Removing Wildfire Pollutants from Indoor Air

Air filtration (or “air cleaning”) is one of the most practical and effective ways to safeguard indoor air quality during and after a wildfire. Air filters are designed to capture pollutants and remove them from the indoor environment.



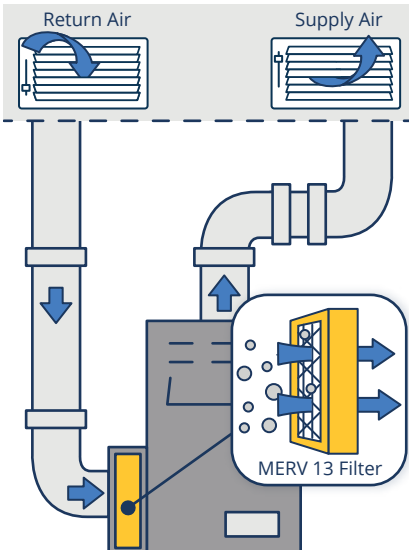
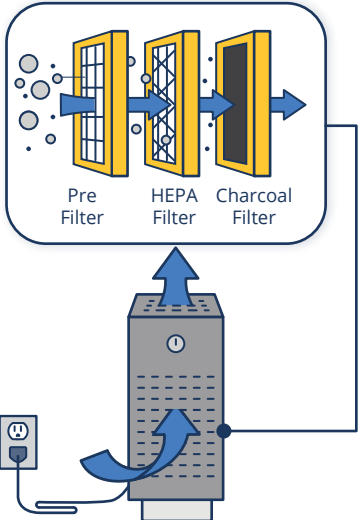
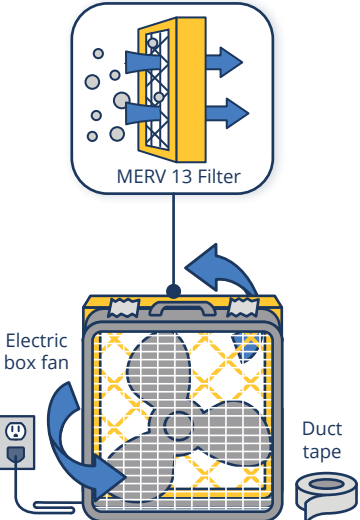

How to Check Outdoor Air Quality in Your Area

Understanding your outdoor air quality helps you know whether using natural ventilation (open windows) will help or hurt your indoor air quality. Check [airnow.gov](https://www.airnow.gov) for the current Air Quality Index (AQI) for your area. When the air quality is Good (an AQI of 0-50), consider opening your windows to air out your home. When the AQI is above 50, keep the windows closed to limit the entry of PM_{2.5}.



How can you effectively filter the air in your home?

Since $PM_{2.5}$ is so small, specialty or high-quality air filters are needed to capture it. Below are three effective approaches.

		
<p>RESIDENTIAL HVAC SYSTEM</p> <p>If your home has a mechanical internal heating and air conditioning unit (HVAC), contact a professional to determine if the HVAC system can support a MERV 13 filter.</p> <ul style="list-style-type: none"> • Many residential HVAC systems are only designed to support MERV 8 filters, which will not effectively capture wildfire emissions. • Do not attempt to use a MERV 13 filter if the system is not designed to support it. <p>See below for more information on MERV 13 air filters.</p>	<p>STAND-ALONE AIR CLEANER</p> <p>Use a commercially available portable air cleaner. Purchase an air cleaner that has:</p> <ul style="list-style-type: none"> • Been verified by the Association of Home Appliance Manufacturers (AHAM) to have a clean air delivery rate (CADR) that is 2/3 of the area of the room where it will be used • HEPA filtration • Activated charcoal filtration <p>Never purchase an air cleaner that introduces ozone.</p>	<p>DIY AIR CLEANER</p> <p>Construct a DIY air cleaner using an electric box fan, a MERV 13 filter, and duct tape.</p> <ul style="list-style-type: none"> • The box fan should have a manufacture date after 2012 and be certified to meet the ANSI/UL 507 safety standard for electric fans. • The MERV 13 air filter should be sized to fit the box fan (20" x 20") <p><i>Watch a short video for complete DIY air cleaner assembly instructions.</i></p> 
<p>Use in rooms that are frequently occupied and/or have vulnerable occupants.</p>		

KEY TERMS

- **Minimum Efficiency Reporting Values (MERV):** An industry standard measurement of an HVAC filter's ability to capture particles. The higher the MERV rating, the better the filter is at capturing smaller particles. To effectively capture wildfire smoke particle emissions, look for filters rated MERV 13.
Note: Home improvement retailers may offer an alternative rating system. Look for filters rated to be MERV 13 equivalent, such as FPR 10 or MPR 1900.
- **High Efficiency Particulate Air (HEPA) Filter:** A type of air filter commonly used in commercially available stand-alone air cleaners capable of capturing at least 99.97% of particles.
- **Clean Air Delivery Rate (CADR):** A measure of how much filtered (cleaned) air an air cleaner can deliver. CADR is measured in cubic feet per minute. The higher the CADR, the more clean air the system is able to produce.
- **Charcoal filter:** A type of filter containing charcoal granules that may remove some VOCs in the air. These filters do not last long and may need to be changed frequently.

