

Indoor Air Filters: Do they work?



What's an "indoor air filter"?

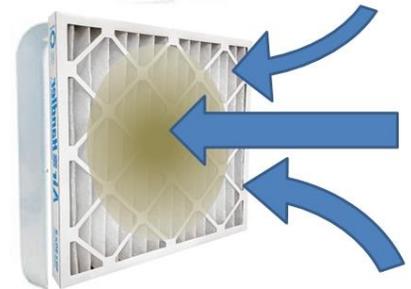
A filter is something that cleans out unwanted things. Recently, the Puget Sound Clean Air Agency has provided air filters and training to community members who seek to clean the air in their homes, from both outdoor and indoor sources of air pollution.

How do the filters work?

A fan sucks the air through a filter. The dust, pollen, and air pollution then sticks to the filter, and cleaner air comes out the other side.



Simply turn the fan on, with the filter attached to the back of the fan. Make sure the arrows on the filter line up with the arrows on the fan.



Filters that are run often (18 hours a day) should be changed every three months. Typically, we have had funding to provide training participants with a year's supply of filters. If additional filters are purchased, they need to have a "MERV-rating" that is 12 or higher in order to achieve the same results.

Do I need to close the windows and doors?

Yes, for the filter to work, you need to close all the windows and doors to the outside first. **If it is too hot inside and you need a window open, do not run your fan with the filter attached.** The filter will not clean the air indoors if the window is open. Running the filter with a window open will also dirty the filter faster, making replacement necessary sooner.



Where should filters be placed?

- For most benefit, fans with filters should be placed in the room where family members spend most of their time.
- Fan should not be used in the bathroom or near water, due to electrical hazards
- Fans should not be pointed into dusty or dirty areas, like cat litter box areas. Our tests show that this can make the air quality worse than not using the fan with the filter at all.

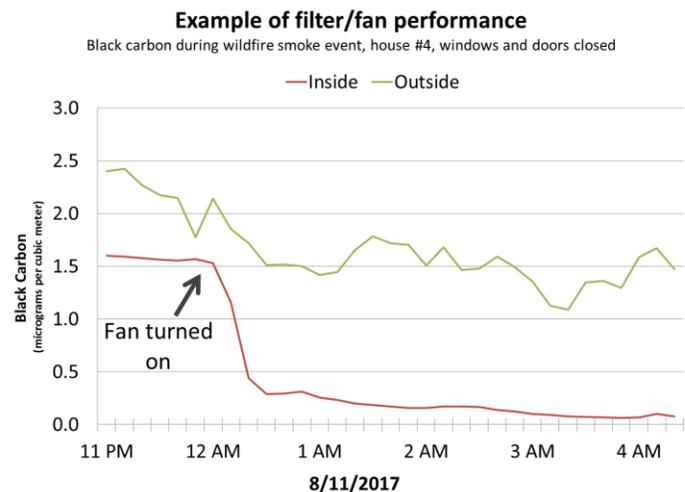
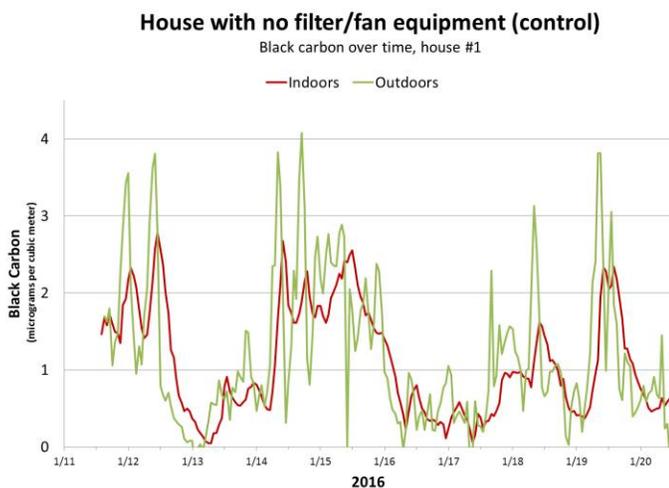


When should filters be used?

- During and after anything that creates indoor air pollution, like smoking, cooking, or burning incense or candles.
- If the air outside is particularly smoky or dusty, or if there's just a general desire to improve indoor air quality.
- When people are going to be in the room being filtered for at least 15 minutes or more. Our tests showed that it can take up to a few hours to clean the air in large rooms that lead into other shared spaces (like hallways).
- Fans should not be used if no one is home, for safety.
- Fans should not be used if everyone is asleep, for safety.
- Again, don't use the fan with the filter on if the windows are open (it won't help, and will clog the filter).

How well do the filters work?

We measured air pollution levels in four homes in the Puget Sound region to learn more about how these filters perform. In smaller rooms, with the windows and doors closed, we found up to a 90% reduction in air pollution compared to the room with doors and windows closed before the filter fan was turned on. We found air pollution levels can drop in about 15 minutes or less in these smaller rooms.



For larger rooms that lead into hallways and other spaces that can't be closed off by doors, the air pollution level took a few hours to drop, instead of a few minutes for the smaller rooms. Air pollution levels in the larger rooms were only reduced up to 50-75% compared to levels in the rooms before the filter fan was turned on.

The graph on the left highlights a typical pattern of air pollution, where the pollution inside the house (red) tracks the pollution levels just outside the house. The graph to the right shows how pollution levels inside a small (12' by 12') room decrease rapidly after the filter fan is turned on.

What types of pollution were measured?

We measured for fine particle counts and black carbon (soot), pollutants known for heart and lung health impacts. The levels for both types of pollution dropped when the fan was turned on, with the amount and speed of the drop varying by room size and configuration. We observed a spike of fine particles that lasts only a minute or two as the fan kicks up dust when it is initially turned on, and quickly cleans out thereafter. We also observed air pollution levels quickly shoot back up whenever windows or doors to the outside were opened.