

HOME FACTS – AIR

Do Air Purifiers Really Work?

Indoor air pollutants are unwanted, sometimes harmful materials in the air. They range from dusts to chemicals to radon. Air cleaners are devices that attempt to remove such pollutants from the indoor air you breathe.

The typical furnace filter installed in the duct work of most home heating and/or air conditioning systems is a simple air cleaner. This basic filtering system may be upgraded by using another filter to trap additional pollutants or by adding additional air cleaning devices. An alternative to upgrading the induct air cleaning system is using individual room, portable air cleaners. Air cleaners generally rely on filtration, or the attraction of charged particles to the air cleaning device itself or to surfaces within the home, for the removal of pollutants. The use of “air cleaning” to remove pollutants from the air in residences is in its infancy.

Because many factors need to be considered in determining whether use of an air cleaner is appropriate in a particular setting, the decision whether or not to use an air cleaner is left to the individual. As of yet, the U.S. Environmental Protection Agency (EPA) has not taken a position either for or against the use of these devices in the home.

THREE STRATEGIES (IN ORDER OF EFFECTIVENESS) MAY BE USED TO REDUCE INDOOR AIR POLLUTANTS:

1. **SOURCE CONTROL** eliminates individual sources of pollutants or reduces their emissions, and is generally the most effective strategy. Some sources, like those that contain asbestos, can be sealed or enclosed; others, like combustion appliances, can be adjusted to decrease the amount of emissions. Unfortunately, not all pollutant sources can be identified and practically eliminated or reduced.

2. **VENTILATION** brings outside air indoors. It can be achieved by opening windows and doors, by turning on local bathroom or kitchen exhaust fans, or, in some situations, by the use of mechanical ventilation systems. However, there are practical limits to the extent ventilation can be used to reduce airborne pollutants. Costs for heating or cooling incoming air can be significant, and outdoor air itself may contain undesirable levels of contaminants.

3. **AIR CLEANING** may serve as an adjunct to source control and ventilation. However, the use of air cleaning devices alone cannot assure adequate air quality, particularly where significant sources are present and ventilation is inadequate. Air cleaners are usually classified by the method employed for removing particles of various sizes from the air.

There are three general types of air cleaners on the market: mechanical filters, electronic air cleaners, and ion generators. Air cleaners may be in-duct units (installed in the central heating and/or air-conditioning system) or stand-alone portable units.

The effectiveness of air cleaners in removing pollutants from the air is a function of both the efficiency of the device itself and the amount of air handled by the device. A product of these two factors (for a given pollutant) is expressed as the units clean air delivery rate (CADR).

What to look for when choosing an air cleaner:

- The potential effectiveness of the device under the conditions it will be used.
- The need for routine maintenance, including cleaning and replacement of filters.
- The estimated capital and maintenance cost.
- The installation requirements (e.g., power, access).
- The manufacturers' recommended operating procedures.
- The possible production or re-dispersal of pollutants, such as ozone, particles, formaldehyde and trapped gaseous pollutants.
- The inability of some air cleaners to control gases and some odors, such as those from tobacco smoke.
- Possible health effects from charged particles produced by ion generators.
- Possible soiling of surfaces by charged particles produced by ion generators.
- The noise level at the air flow rates that will be used.

Portable air cleaners vary in size and effectiveness in pollutant reduction capabilities. They range from relatively ineffective table-top units to larger, more powerful console units. In general, units containing either electrostatic precipitators, negative ion generators, or pleated filters, and hybrid units containing combinations of these mechanisms, are more effective than flat filter units in removing tobacco smoke particles. Effectiveness within these classes varies widely, however. For removal of larger dust particles, negative ion generators, without additional particle capture mechanisms (e.g., filters), may perform poorly.



Are Ozone Generators Effective?

Available scientific evidence shows that at concentrations that do not exceed public health standards, ozone has little potential to remove indoor air contaminants.

Whether in its pure form or mixed with other chemicals, ozone can be harmful to health. When inhaled, ozone can damage the lungs. Relatively low amounts of ozone can cause chest pain, coughing, shortness of breath and throat irritation.

It may also worsen chronic respiratory diseases such as asthma as well as compromise the ability of the body to fight respiratory infections.

Some studies show that ozone concentrations produced by ozone generators can exceed health standards even when one follows manufacturer's instructions. Many factors affect ozone concentrations including the amount of ozone produced by the machine, the size of the indoor space, the amount of material in the room with which ozone reacts, the outdoor ozone concentration, and the amount of ventilation. These factors make it difficult to control the ozone concentration in all circumstances.

Available scientific evidence shows that, at concentrations that do not exceed public health standards, ozone is generally ineffective in controlling indoor air pollution. The concentration of ozone would have to greatly exceed health standards to be effective in removing most indoor air contaminants. In the process of reacting with chemicals indoors, ozone can produce other chemicals that themselves can be irritating and corrosive.



Pollutants in indoor air may be divided into three groups: particles, gaseous pollutants, and radon. Some air cleaners, under the right conditions, can effectively remove small particles which are suspended in air. However, controversy exists as to the efficiency of air cleaners in removing larger particles such as pollen

and house dust allergens, which rapidly settle on surfaces. Animal dander may settle more slowly, although the surface particles far exceed the amount in the air. Therefore, control of the sources of allergens and ventilation should be stressed as the primary means of reducing allergic reactions.

Some of the air cleaners containing sorbents may also remove some of the gaseous pollutants in indoor air. However, no air-cleaning systems are expected to totally eliminate all hazards from gaseous pollutants and these systems may have a limited lifetime before replacement is necessary. In addition, air cleaning may not be effective in reducing the risks of lung cancer due to radon.

TRIVIA BLOCK

A cubic mile of ordinary fog contains less than one (1) gallon of water!!