All about in-room air cleaners

Understanding what they are, how they work, and how to select and use one.

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Viruses that transmit as airborne particles, such as COVID-19 and measles, pose a significant threat because:

1. They can fit in places nearly 10,000 times smaller than a human hair.
2. Travel up to 20 to 30 feet.
3. Stay active for at least 4 hours.

The basics of airborne transmission

There are three basic concepts you need to understand about airborne virus transmission.

The Source

The person potentially infected with the virus and spreading it through breathing, talking, sneezing, coughing, or singing, with or without showing signs.

The Pathway

The route the airborne virus particles travel through the air from the infected person to you or another healthy person.

The Receiver

This is you or the individual who could get sick with an airborne virus from the source.

How in-room air cleaners work

One of the best ways to reduce the risk of airborne viruses spreading at the pathway level is dilution.

In-room air cleaners can help dilute the air of a single room, helping clean the air and making it safer for the people inside.

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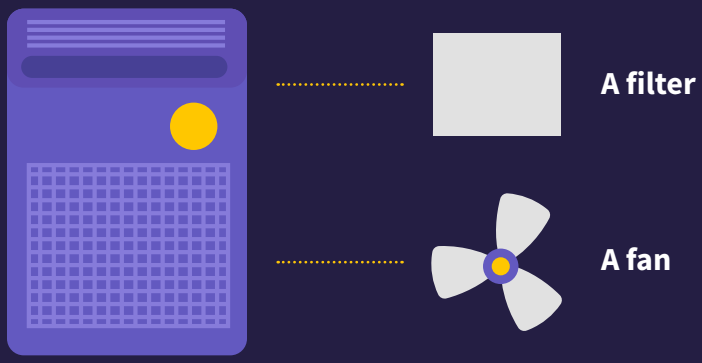
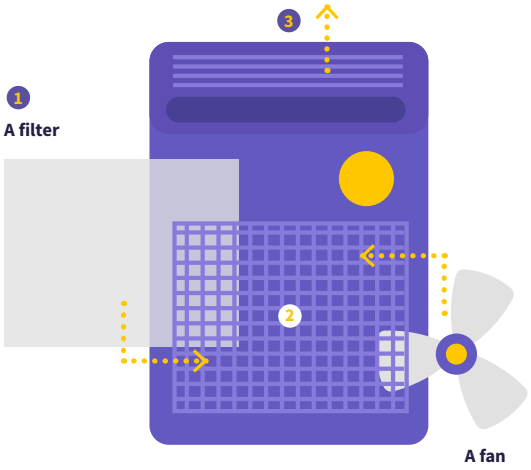
How in-room air cleaners work





1. The filter and fan move the air into the unit.
2. Through the filter.
3. And back to the room.

Two key parameters impact the performance of in-room air cleaners:

The efficiency of an air-cleaning device is a measure of its ability to reduce the concentration of pollutants in the air **that passes once through the device,** and it's measured in the laboratory.

The effectiveness of an air-cleaning device or system is a measure of its ability to remove pollutants from **the spaces in which it is operated.** The in-use effectiveness of any device depends on many factors, including its location, installation, airflow rate, and operating hours.

Selecting the right in-room air cleaner for your needs

A helpful measure to evaluate the **efficiency** of an in-room air cleaning device is the Clean Air Delivery Rate (CADR).

When choosing an indoor air cleaner, use these estimations of the minimum CADR required per room area:

In-room Air Cleaner Sizing for Particle Removal

Room area (square feet)	100	200	300	400	500	600
Minimum CADR (cfm)	65	130	195	260	325	390

Note this chart is for estimation purposes. The CADRs are calculated based on an 8-foot ceiling. You may want to select a in-room air cleaner with a higher CADR if you have higher ceilings.

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The higher the CADR, the faster it will clean the air.

Check the CADR label for:

- **CADR ratings for smoke, dust, and pollen.** When looking for an in-room air cleaner that can capture viral particles, use the room area value on the CADR label for smoke, since these particles are as small as viral particles. If the CADR for smoke is not provided, multiply the manufacturer's general CADR recommendation by ⅔ to estimate the value for smoke.
- **The suggested largest room size that the unit is appropriate for.** This size assumes a ceiling height of up to 8 feet.

If your in-room air cleaner doesn't have a CADR value, you can determine the airflow rate needed for that device to work in a particular room size.

To determine the airflow rate, you must:

1. **Determine the room size** where you plan to use the unit by multiplying the room's length, width, and height.
2. **Multiply how many times per hour you want to clean the air in the room.** Remember, 5 ACH is a good baseline.
3. **Divide this amount by 60 minutes.** This will be the target airflow rate you want for your space.

Once you have an adequate in-room air cleaner for your space and needs, follow the recommendations below to make the best use of it:

Place your unit correctly

- Ensure your in-room air cleaner is positioned to collect as much room air as possible.
- If you know the source, place the unit's intake near them. If you don't, put it in a location where it directs clean air to those indoors.

Remove barriers

- Ensure that nothing - such as walls or curtains - interferes with the outlet or intake.

Cleaning and maintenance are key

- To ensure optimal effectiveness, be sure to regularly replace or clean filters according to the manufacturer's instructions.

Buyer Beware

Be aware that many new in-room air cleaner products come to market every day and are being sold faster than ever since the outbreak of the COVID-19 pandemic.

To ensure you select the safest and most effective solution for you, your space, and your community, focus on air cleaning technologies that are:

- Cost-effective.
- Recognized by authoritative sources.
- Scientifically proven.

"The best way to address residential indoor air pollution usually is to control or eliminate the source of the pollutants and to ventilate the home with clean outdoor air." ~EPA, 2018