

# Making a one-filter DIY air cleaner

## Why a one-filter DIY air cleaner?

The original DIY air cleaners (Corsi-Rosenthal boxes) use four filters taped to a box fan. The fan pulls air through the filters, which collect small particles in the air. The particles include viruses like SARS-CoV-2, pollen, dust and other often-invisible hazards.



When there's no space for a four-filter box, a one-filter version is useful. It's less expensive to make, although the filter needs to be changed more often.

To be as effective as possible, the fan's card-

board box is used to make a space between the fan and filter. This increases air flow, reduces strain on the motor and makes filter changing easy.



Covering the outside of the front of the fan (where the air comes out) also increases air flow. This "shroud" (see the photo) reduces the fan noise too.

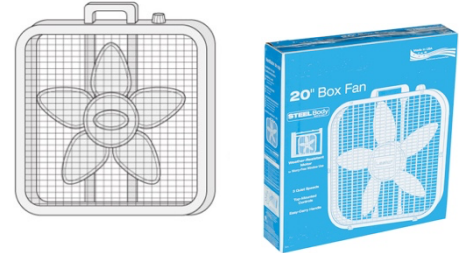
Some people use adhesive covering over the box and shroud. (See photo.)



The estimated clean air delivery rate (CADR) is 248 cubic ft./minute (CFM) in a 384 sq. ft. room (8-foot ceilings).

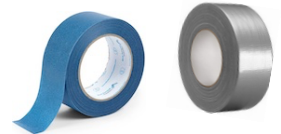
## What do you need to make the air cleaner?

- ✓ a 20" box fan and its cardboard box



- ✓ one 20" x 20" x 1" MERV 13 air filter (a 2-inch one could work too)

- ✓ painters tape and good duct or similar tape



- ✓ a box cutter/utility knife

- ✓ a marker, pen or pencil



- ✓ a hacksaw (optional)

- ✓ adhesive covering (used for kitchen drawers, etc. – also optional – to go over the box and shroud)



## For more information about Corsi-Rosenthal DIY air cleaners

see [www.cleanaircrew.org](http://www.cleanaircrew.org) or e-mail [ask@ohcow.on.ca](mailto:ask@ohcow.on.ca).

These instructions are based on OHCOV experience and David Elfstrom's tweets at <https://bit.ly/3EIZ3X8>, <https://bit.ly/3kuleZ7> and <https://bit.ly/3ZkTpSI>.

## Instructions

### 1. Check the fan and box direction

Take the fan out of its cardboard box. Plug it in to make sure it works properly.

Seal the fan box edges with tape.

Place the back of the fan against the box to figure out which way the box should go. (Slightly rectangular boxes are better on their side.)



### 2. Attach the filter to the box

The filter is at the back of the air cleaner.



With the box the right way up, centre the filter on it. Pleats should be vertical. Trace around the edges.

Then mark or measure a "frame" to hold the filter. Make it at least a half-inch inside the line you traced (see the photo). This prevents the filter from falling through the space you cut out.



Check the filter against the frame before cutting the cardboard.

Place the filter against the box, covering the space you cut out, pleats vertical. Make sure the arrow (indicating the direction for air flow) faces in.

Use the painters tape to seal the filter to the box. That makes it easy to change the filter.

### 3. Attach the fan to the box

Depending on design, cut a space in the fan frame for the power cord to move freely (see photos). Do this before the next steps. (For other fans, see the taping instructions below.)



Centre the fan on the second side of the box and trace around it. Again, you need a "frame" like the one for the filter. Measure or mark a line about a half-inch inside what you traced. Cut along that inner line.

The fan is supposed to pull air through the filter. Make sure it's facing the right way. (Usually, the label is facing out.) Centre it over the space you cut out.

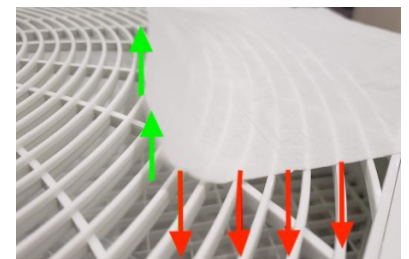
Use duct tape to seal the back of the fan to the box. When you get to the power cord, tape over it. Then cut or slit the tape on both sides of the cord. Place a small piece of tape under the cord, to make a seal.

Cover all the holes in the fan (often in the bottom).

### 4. Make a shroud for the fan

1. Using duct tape, make a circle that leaves a clear space of 15 inches/38.1 cm (for Lasko fans) or 13.5"/34.5 cm (for Utilitech/Hurricane fans).
2. The cardboard cut out for the filter side should fit over the front of the fan. Tape it in place. Then cut out a circle (same size as above) in the middle. (Save the cut-out circle for the next one.)

For other fans, hold a tissue at the edges of the fan to see where air is being sucked in or blowing out (see photo). The shroud covers the edges where the air is sucked in, leaving a circle in the middle.



See finished air cleaners on the front page.

Always check for possible leaks, using a tissue.  
A second set of eyes helps too.