

DIY AIR PURIFIERS

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Build Your Way to
Clean Air Today

WELCOME :D

When people are sick, they exhale infectious particles, even if they're asymptomatic. Respirators greatly lessen the spread of those particles, but they aren't perfect. Air purifiers are an excellent additional layer of safety!

This zine will show you how to build a high-efficiency air purifier for cheap, so you can have more fun, more safely, with your pals!

There are lots of cool DIY purifier designs out there. This zine focuses on a four-filter design that's often referred to as a Corsi-Rosenthal, or CR, box.

WHY DIY?

Commercial air purifiers are expensive, and in general, the better they work, the more expensive they get! But you don't need to spend lots to stay safe.

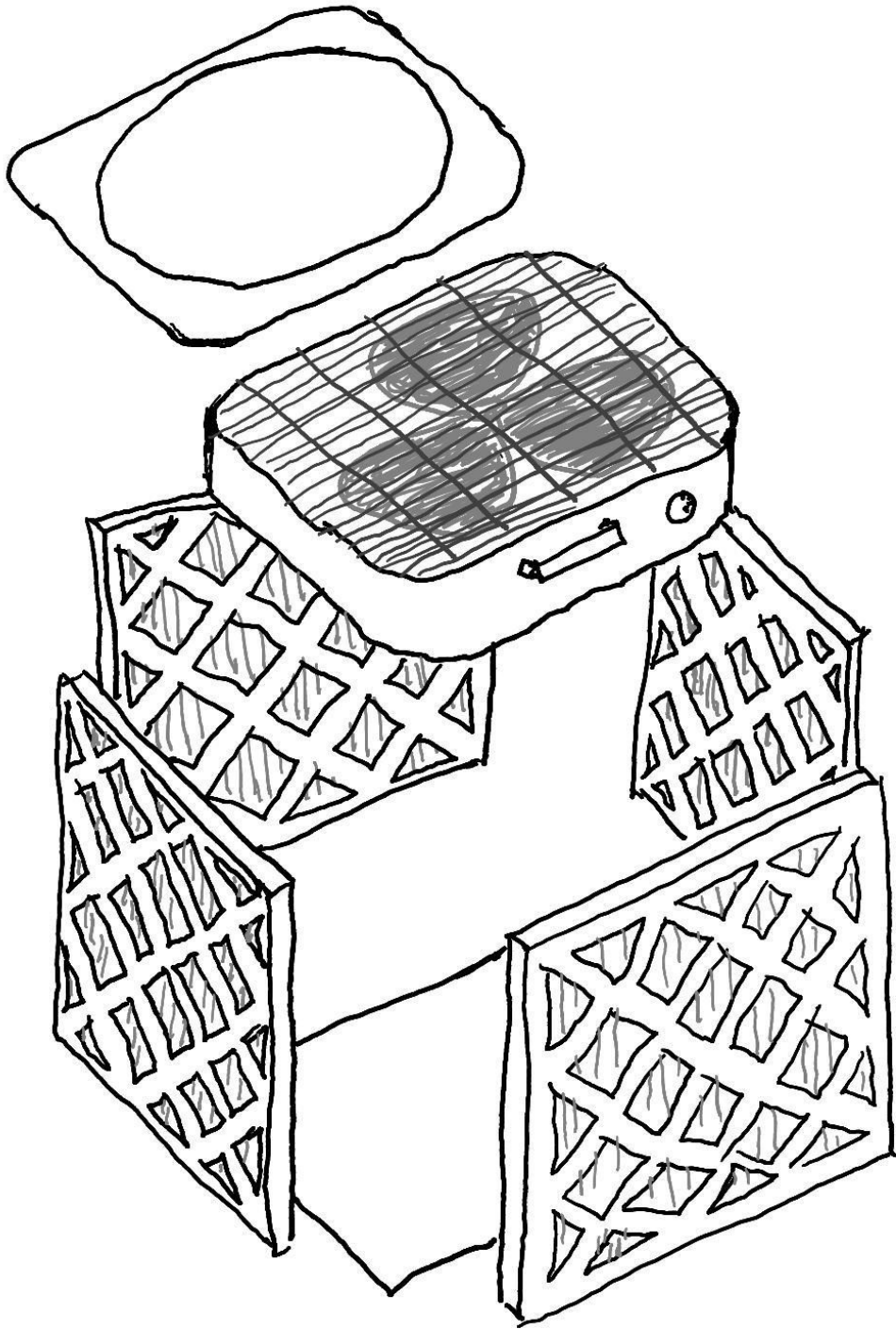
This purifier design is relatively inexpensive (~150 CAD at press time, depending on where you get your filters and fan), it doesn't lock you in to a specific manufacturer's filters, it's simple to build and troubleshoot, and it cleans the air at least as much as many commercial purifiers (see spreadsheet linked on back cover).

WHAT INGREDIENTS

DO YOU NEED?

- MERV 13 furnace filters, 20" x 20" x 1" or 20" x 20" x 2" (you can find these at hardware stores or furnacefilters.ca (not affiliated))
- 20" x 20" box fan (any thickness)
- two 20" x 20" pieces of cardboard (could be from the box the fan came in, the box the filters came in, or your usual cardboard dealer)
- duct tape
- scissors/knife

HOW DO THEY GO TOGETHER?



Pretty much like this! (More details on the next page)

MISC. TIPS

Tip 1: *The arrows on the filters should point inward, and the fan should blow away from the box.*

A CR box works via negative pressure. When the fan is turned on, it draws air from within the box and shoots it away from the box. Air from outside the box is then pulled into the box, through the filters, to replace it and get shot out of the box next.

The arrows along the filters' edges indicate the direction in which air is meant to flow through them. They should therefore be pointing towards the inside of your CR box.

Tip 2: *The pleats on the filters should be running vertically when the box is standing up.*

The pleats on the filters are the ridges/lines that run from one side to another. If you build your CR box such that the pleats run horizontally when the box is in operation, the filters might compress under the weight of the fan.

Tip 3: *Make sure the fan controls are accessible when the box is finished.*

You don't want to tape your box all up only to realize the power switch is inside the box!

& TRICKS

Tip 4: *Cut a cardboard shroud to cover the fan's corners.*

Take a flat piece of cardboard about the same size as your box fan, cut a circle out of it about as far across as the fan blades, and tape it over the fan. You've done it correctly if, when you're looking straight down at the fan when it's turned on, the fan blades aren't covered but the empty corners of the box are.

This reduces the amount of filtered air that gets drawn immediately back into the CR box. It's an optional step, but it makes your CR box more effective, so we recommend it.

Tip 5: *Stagger the filters in a pinwheel fashion so they make a square.*

When you're looking down at the filters from above, they should look like the picture on the left, not the picture on the right.

This helps you get a nice square shape. Since your box fan is also a square, that makes it easier to fit your fan on top of the CR box without gaps on the ends.



ADDITIONAL RESOURCES

Want to know how much clean air your new CR box puts out? Clean Air Stars has a Google spreadsheet of air purifiers that provides helpful information, including CADR, on hundreds of air purifiers, including a few CR boxes, which are called “DIY __” in this spreadsheet. You can find it by scanning this QR code or by going to filters.cleanairstars.com and following the “full dataset” link.



The Corsi-Rosenthal Foundation also has lots of great info, including a very detailed FAQ. Check them out at corsirosenthalfoundation.org.

(We aren't affiliated with Clean Air Stars or the Corsi-Rosenthal Foundation; we just think they're neat.)



This zine was made with love and by hand by members of COVID Action Montreal. You can find us on the World Wide Web at covidactionmtl.com.

Thanks for reading, and stay safe out there <3