

From air purifiers to DIY hacks: What are the best ways to try to keep your home smoke-free?

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If you buy one, it's important to get an air purifier that's appropriate for the size of the room you want to use it in.

(Getty Images: skaman306)

Rooms reeking of smoke, alarms going off due to the visible haze inside your home, waking up in the middle of the night smelling smoke in the air.

Australia's bushfire crisis is [affecting air quality](#) and the wellbeing of many of us. Smoke haze has been blanketing many parts of the country, including some of our major population centres - Canberra, Sydney, Melbourne and other capitals.

So we asked the experts about some of the things you can do to try and keep your home smoke-free.

Here are their responses to common questions.

If there's smoke around, is it best to shut up your house and stay inside?



Ensuring doors and windows are properly sealed can help with the air quality in your home.

(Unsplash CC: Eduard Militaru)

Experts agree we need to stay inside and out of the smoke as much as possible, especially when the air quality is hazardous.

"The guidance that's being provided of **staying indoors with your doors and windows closed is good** up to a point," says environmental scientist Amanda Wheeler, of the Australian Catholic University, who has conducted research evaluating interventions to improve indoor air quality affected by smoke.

"Houses naturally breathe, because you don't want to build up carbon monoxide inside a house until the point that you're going to keel over."

How good that advice is **depends on how airtight or leaky your house is**, as that determines the rate of air exchange between the outdoors and inside, says director of the International Laboratory for Air Quality and Health, Lidia Morawska of Queensland University of Technology.

Old houses are typically leakier than newer houses, the design of your house also comes into play.

Queenslanders, for example, have lots of holes and gaps to allow for a much higher rate of air exchange than dwellings designed for the cooler temperatures in more southerly climes.

Do you have questions or concerns about air quality that you'd like us to put to an expert? Please email health@abc.net.au and we'll try our very best to find an answer for you.

How can I stop smoke coming in?

It's not just a matter of closing your windows and doors and hoping for the best.

Try to **seal your house as best you can** to stop these pollutants coming into your home in the first place, Dr Wheeler said.

Here are some things that can help you do this:

- Seal around doorframes and windows with **foam tape** (you should be able to get this from the hardware store).
- Add **draft stripping** under doors to prevent smoke seeping in under doors (again, most hardware stores sell this).
- Use wet towels to block drafts under doors and bigger gaps around windows.

Should I use air con when there is smoke around?

Yes and no.

You can **use a reverse cycle air conditioner**, just make sure you switch it onto recirculate mode so it's not drawing in air from outside.

You **shouldn't use evaporative cooling** air conditioning as these systems draw air in from outside. So turn these off to keep the smoke out, although that will obviously leave with you a very hot house.

Fans can keep your house cooler and possibly help get rid of the smell, but on their own fans **don't remove smoke particles**.

The best option is a **recirculating air purifier**, which has a HEPA filter, but these are expensive and mostly unavailable at the moment.



Be sure to use recirculate mode on your reverse cycle air conditioner when air quality is poor.

(Getty Images: Jureeporn Chaiyapram / EyeEm)

When should I open up my house again?

As [Dr Wheeler's research has shown](#), it's important you open your windows and doors **once the smoke starts to clear**. This can help you get rid of the small smoke particles that have been trapped indoors, which should also help dissipate any smell.

Unfortunately, there are no hard and fast rules on when you should do this.

A lot of people will be affected by smoke regardless of the level of the pollutants, Dr Wheeler said.

But if the air quality seems worse inside your house than it is outside, then it might be the time to open up.

There are a number of websites and apps that give you hourly updates on air quality in certain, if you keep an eye on these they can tell you when the air quality is improving. But look out for hourly updates, as opposed to the 24-hour averages.

What is bushfire smoke made of?

Bushfire smoke, like smoke from any combustion, contains over 4,000 different components, said Professor Morawska.

Potentially the most hazardous pollutant in this mix, and the one you've probably heard the most about, are [the ultrafine particles or PM2.5](#).

We can track some of these particles smaller than 2.5 micrometres, but not all of them, Professor Morawska said, so there could be smaller particles getting into your home that we can't detect.

Do air purifiers work and what should I look for if I want to buy one?

Yes, **if it has a HEPA filter**, or high-efficiency particulate air filter.

["\[But\] I don't know if it's even possible to buy one in Australia at this point," Dr Wheeler said.](#)

Mark Taylor of Macquarie University says **filters can strip out nearly 100 per cent of all the particles in the air**, and will help eliminate any excess amount of particles in people's living environments.

As the smell of smoke is predominantly associated with the particles, the air purifier should also **help with the smell of smoke** in your room too.

You need to buy the **right-sized air purifier for the room** you want to use it in, you'll find this information on the product.

"If the room is too big, it's just going to keep pumping air through the filter but it's never going to catch up and clean the air," Dr Wheeler said.



Air purifiers with HEPA filters can strip out nearly 100 per cent of all the particles in the air.

(Getty Images: 1989_s)

So it may not do well in a large open-plan living, but will work in a bedroom with the door closed.

You may need to run your air purifier at quite a high setting, at least initially, if you have a lot of smoke you'd like to remove, and that will be pretty noisy.

Dr Wheeler says it's not clear how effective purifiers are with the current bushfire smoke.

Her previous research looked at how air purifiers handled wood smoke coming indoors and found a 50 per cent reduction in smoke levels in the space.

"The main difference really is the levels of the smoke. For bushfires we've seen concentrations of fine particles that are astronomical at the moment," she said.

"Knowing whether these air cleaners are going to work at those really high concentrations is challenging at this point."

We also don't know how well they'll go being used over a longer period of time, as studies generally measure their efficacy over a few days or a week at a time.

What about DIY air purifiers?

While people have been sharing tutorials for how to make do-it-yourself air purifiers online, Professor Taylor says it's **impossible to say how effective they are as they haven't been tested.**

He's not trying to discourage people, but he just doesn't know if they are effective.

Again, if you are going down this path you need to **use a HEPA filter.**

What's the best way to monitor air quality inside my home?

As well as checking the outdoor air quality index, using **devices to monitor the indoor air quality inside your home can be very helpful** when there's a lot of smoke around, says architect Shamila Haddad from UNSW.

This is especially true for those **more vulnerable to the effects of smoke including older people, children, pregnant women and people with asthma and allergies.**

"Affordable indoor air quality monitoring devices can be found and purchased online from different suppliers," Dr Haddad says.

These devices may allow you to access real-time data through a website or mobile app. Some also allow you to perform spot measurements of your indoor air quality.



Bushfire smoke is a mixture of over 4,000 different components.

(Unsplash CC: Hamish Weir)

Other things experts say can help:

- You can **wear a [P2 mask](#) indoors** if you're really struggling, but it probably won't be that comfortable, said Professor Taylor.
- Try to **spend time inside buildings that have better air filtration systems** (better than what you have at home) – like offices, shopping centres or cinemas, said Professor Morawska, if they're still open.
- If it's safe to do so and you are able to, **try to go somewhere where the pollution is not as bad.**

Things you might want that won't hurt, but probably won't help much:

- **Hanging wet fabric** (like lightweight tea towels or sarongs) over, or in front of, fans. This **probably won't catch particles** because they are much too tiny to be stopped by the cloth. (For comparison, PM2.5 particles have a diameter of less than 2.5 micrometres, human hair is 50 to 70 micrometres.)
- **Spraying water into the air** to trap some of the particles is also unlikely to have much impact in homes. Even if the water makes them fall out of the air the **particles would easily get resuspended once they dried out**. Relative humidity (or the amount of water in the air) only seems to affect the particles when it is over 75 per cent, which is really humid.
- **Wet towels in the middle of the floor** won't do much, because the smoke **particles are so small they're not as efficiently deposited on surfaces** as larger particles are.
- Using a **vacuum with a HEPA filter will remove larger particles** from surfaces, but it's not going to help much in terms of protecting you against smoke particles in the air.

You should probably avoid this:

- **Burning incense** to mask the smell of the smoke, this will only add to the particulate pollution you're dealing with.
- Using **wet towels wrung out in vinegar or essentials oils** to clear the smell of smoke. Dr Wheeler is not a fan of adding anything to her air as some people find such scents irritating.

The LINK: <https://www.abc.net.au/news/science/2020-01-11/keeping-your-home-smoke-free/11857898>