

Choosing an air purifier when you have multiple chemical sensitivity



We discuss what to look for, and beware of, when buying an air purifier. When you have environmental illness (MCS or EHS) the issues are different than for regular people.

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About the picture

The picture shows an Aireox air purifier, one of the brands designed by and for people with multiple chemical sensitivities.

What to expect

An air purifier can help if it is the right kind and of sufficient capacity. But it cannot perform miracles.

2 *Air purifiers*

If you share an office with someone highly fragranced, or who smokes, no air purifier will make a real difference. An air purifier can make a decent air quality better, it cannot solve a big problem.

It is always more effective to remove or reduce the source of the air pollution if at all possible. Improving ventilation with fresh air is also helpful. Installing an air purifier is then the next step.

Many air purifiers are good at removing dust and pollen, but useless against chemical fumes.

A few brands are specifically designed for people with MCS, but you won't find them on store shelves or listed in glossy magazines.

Independent testing

Unfortunately, there are no independent tests available to help buyers with MCS. *Consumer Reports* and others test only major brands, and ignore the special MCS air purifiers. And they do not really test how effective they remove toxic gases or how much EMF they produce.

Doing such testing is costly, so we are unable to do it here at EI Wellspring. What we can offer is information on what to look for when making your choice.

The type of filter

There are several types of filter available. Which one to choose depends on what you are trying to remove from the air. Is it dust, smoke particles, or chemical fumes?

If you want to remove pollen or plain dust, a HEPA filter is the best. It traps the small particles inside the filter and should last for years. It actually gets more effective over time, as larger holes in the filter material gets clogged up.

Electrostatic filters use electricity to give a charge to dust particles, which are then attracted to a tray where they collect. The tray must be cleaned regularly. These filters do not remove any gases and some of them produce ozone which is a hazard.

Negative ion generators work similar to the electrostatic filters. They just use negative ions instead to make dust particles adhere to a surface. Some models do

not have a collection tray, but send the ions out into the room. The dust particles that get hit by an ion will then tend to stick to walls, carpets, and furniture until the charge wears off; then the particles can become airborne again. Ion generators may also generate ozone.

There are small portable ion generators intended to hang around the neck. They generate high EMF and also some ozone. We consider them a hazard.

Filtering fumes

If you want to reduce chemical fumes, there are some options. The vendors' materials should say what sort of fumes their air purifier is better at, and worse at. A few vendors offer a choice of cartridges for their purifiers.

The chemical filters work very differently from the HEPA filters. They are thick and heavy, with myriad microscopic pores the air is pulled through. As the air passes through, the gases react with the filter material and gets adsorbed.

Beware of deceptive advertising that states the purifier has carbon filtration, but it is so puny that it will be exhausted within a week. Ask how much filter material there is. It should be at least 2 pounds (1 kg). More is better.

The traditional filter is activated carbon, which can be made from various materials, such as coconut and bitumen (coal). The coconut filters seem to be the most popular among people with MCS (some report not tolerating the bitumen filters).

Carbon filters work well for smoke and many kinds of chemical fumes, but not for formaldehyde.

Zeolite filters are made from a natural rock containing aluminum and silica. Sometimes potassium permanganate or carbon is added. There are many versions available, which are typically sold as a brand name, rather than as generic zeolite.

Zeolite filters work much like the carbon filters. They are usually better at filtering formaldehyde, sulphur dioxide and some solvents, depending on the specific type of zeolite.

Some of these filter materials are sold in bulk so you can refill yourself and save money, though it is rather dusty work.



Zeolite air purifier from Austin

When the filter material is worn out, it starts releasing some of the trapped fumes. It is hard to tell when it is time to change the filter, though if the zeolite includes permanganate the filter will turn from purple to brown as it gets worn.

Filtering smoke particles

Smoke from cigarettes, woodburning fireplaces, and forest fires can be filtered multiple ways. The problem is that the trapped smoke particles can continue to give off fumes.

Electrostatic filters are effective, but the tray must be cleaned frequently. HEPA filters trap the smoke particles, but then they give off gases into the airstream. To be effective the HEPA filter must be followed by a carbon filter.

A hefty carbon or zeolite filter is by itself effective against smoke (we've used them through several forest fires).

Ozone

Ozone is where three oxygen atoms are attached together instead of the usual two. That makes it highly unstable and very reactive when in contact with other molecules.

Ozone can transform surfaces and gases into something more benign. Or make it worse. It is a gamble. More importantly, ozone attacks sensitive parts of the lungs and airways of people who breathe it in.

Ozone causes smog in cities, as it reacts with pollution from cars and trucks. It does not belong in a home where it can harm people, pets, and plants. Don't buy an air purifier that sends out ozone, whether by intent or not.

Tolerating the filter

The filter material interacts with the air that passes through it, and may make it worse. The HEPA filters are often made of polyester, which can cause problems for people with polyester intolerances. It may work if the HEPA filter is followed by a carbon or zeolite filter.

The zeolite and carbon filters can also be a problem for people sensitized to these materials. This is very rare, but we do know one credible case.

Ask the vendor if the electric motor is in the airstream or not. If the motor is in the airstream then the fumes from the hot coils will get into the room, which is a problem for some people.

Beware of sales tactics where they say that people with MCS are made sick by purifiers they do not sell. We've heard that said about a particular purifier which has been used successfully for forty years by thousands of people with MCS. They probably heard about one person who had a problem with that particular air purifier, and then conveniently made it into a common problem. You can always find someone with MCS who have a problem with anything, if you ask enough people.

What size?

The purifiers are either rated by the volume of air (cubic-feet-per-minute, CFM) or how big a room they can manage.

Be aware that those ratings are when the purifier runs at its maximum, which is usually too noisy to do all the time. Also be aware that most of the air coming out of the purifier gets sucked back in right away. It will create a “bubble” of clean air around the purifier, while the air in the corners of a large room can get stagnant.

The small desk models are usually too puny to be of much use.

An oversized air purifier can quickly clean a room in case it suddenly gets filled by smoke from a forest fire, or fumes from the neighbor’s dryer vent. Then it can be turned down again to a slower speed.

You should size the purifier for the room it will be in. If you want to cover more rooms, you will probably need a purifier for each room. One big purifier does not really help the adjacent rooms, as there is little airflow even through open doors.

If you want to cover an entire house, consider installing a whole-house system, though they are costly and require air ducts.

Cabinet materials

The cabinets are either made of plastic or coated steel. Some people may not tolerate the fumes from the plastic. The air purifiers specifically designed for people with MCS all have cabinets of coated steel.

Gimmicks

Some purifiers have a monitor that warns when the filter needs to be changed. These either count the hours the purifier has been running, or they measure the air pressure loss across the filter.

They can be helpful, but they are just estimates of when a filter needs to be changed. When it comes to carbon or zeolite filters, it can only be a very rough estimate.

These monitors are electronic, though the EMF should be small, unless it can notify you wirelessly.

We’ve heard about models touted as having a propeller with a fancy name. That *could* mean there is less noise, or that the airflow bypasses the electric motor. Or it could be just hype. Ask what is the *actual* benefit of it.

EMF issues

All air purifiers use electricity and thus emit EMF, but the amount can vary dramatically. Buying a purifier with a metal cabinet can help shield some of the EMF. A steel cabinet is especially helpful against the EMF from the motor.

DC motors tend to radiate much more than AC motors. If you don't need a purifier that can be used in the car, don't buy one that can run on 12 volt DC.

If the air purifier has two ports, one for AC and one for DC, that means it has a DC motor inside. (Or possibly an inverter, which is even worse.)

We have heard of air purifiers with variable-speed motors. They may save electricity, but they are bad news on EMF; worse than regular AC and DC motors. If an air purifier has two or three fixed speeds, that doesn't necessarily mean it has a variable-speed motor.

The electrostatic filters, and especially the ionizers, send out broad-spectrum EMF. The early wireless transmitters used the same principle of a "spark gap" to transmit their morse code signals.

Some purifiers have wireless controls. You can sit in your easy chair and turn it on, or change the speed. You may even check whether the filter needs to be changed. Just say "no."

Noise

People with environmental illness often report that noise bothers them more than regular folks. Whirring noises from a fan is often a problem. Does the purifier have a low-noise fan? Does it have enough air flow when running at a less-noisy speed?

A slow-moving fan is less noisy than one that spins fast. A large fan that turns slowly can move as much air as a small fan that turns fast. Beware of compact air purifiers that only have room for small fans, they tend to be noisy.

Intermittent use

If you have a purifier that is too noisy or sends out too much EMF, you may be able to run it intermittently. Perhaps five minutes each hour on the high setting is acceptable. This method works best with a large air purifier.

Return policy

Check what the return policy is. We know one person who bought a \$250 air purifier which she didn't tolerate (high EMF), but the vendor demanded a \$180 restocking fee and had no understanding of the problem.

Designed for the environmentally ill

There used to be at least five brands of air purifiers that were specifically designed for people with environmental illnesses. Three of them have been available for decades and still are: Aireox, Austin, and E.L. Foust.

Non-electric methods

A lot of people simply keep a window cracked just a little bit, at least when the outside air is not smokey. Natural ventilation may cost a little extra for heating and cooling, but you save the electricity the air purifier would use.

The U.S. Environmental Protection Agency compared the indoor air to that outside for a lot of buildings in the 1980s and 1990s. They found that the outside air was ten to a hundred times *better*, even for buildings in polluted downtown areas. Your indoor air is probably better than most, but don't rule out outside air.

An idea has been circulating in the MCS community for decades, and it still doesn't work. The idea is to lay out bags of zeolite in a room, and they should adsorb chemical fumes on their own without a fan.

It is wishful thinking. A fan is necessary to pull air through the microscopic pores in the materials, it doesn't happen by natural air movement. You would need a very large surface covered with zeolite to get an effect. And even that doesn't work well.

At the Technical University Braunschweig in Germany they tried to paint the walls of a test chamber with zeolite. It worked, but only for 26 hours, then the zeolite surfaces were saturated (Schieweck and Bock 2014).

More information

For other articles on how to live with environmental illnesses, go to www.eiwellspring.org