

## How to detox a new or used car



**So you got a car, but the fumes inside are too strong. Many people have had to deal with that and here is what some of them did.**

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The inside air in a car is often a smelly soup of dozens or even more than a hundred toxic chemicals, especially when the car is hot. Some people are sickened by these fumes.

Some are able to drive the car with the windows all open. Others are much more sensitive and need to actively detoxify the car. How much detoxification is needed depends on the individual. This article provides a catalog of options to choose from.

### **Phase 1: offgassing**

The first phase of detoxing a car is to remove the chemicals as fast as possible. The main tools are heat to volatize the chemicals and lots of fresh air to move the fumes away. A sealed-up car will not improve on its own.

There are multiple ways. First we present the two easiest methods to offgas a car. If they are not for you, we then present more laborious methods. At the end of this article we cover some extreme measures.

Even if you can do the "lazy" methods, you may need to do some additional work later on.

### **Let someone else use the car**

A simple solution is that someone else uses the car for a year or more, until it becomes tolerable. This could be someone in the same household who does not have MCS or someone else, such as a friend or an uncle.

Be aware that the driver of a very toxic car will smell like it, as the chemicals hang in the clothes and in the hair. They may have to shower and change clothes before you can be around them.

Make sure that the driver keeps the windows open while driving to get fresh air inside. Or at least run the airconditioning on the fresh air setting. Lots of outside air is essential.

An option is to install rain guards and leave the windows open all the time (see next section).

### **Ventilation and airconditioning**

Running the airconditioner cools the interior and thus reduces evaporation of chemicals some, but it is not a dramatic help (Chien, 2007). We recommend driving with windows open and the ventilation system set to "fresh air" as much as possible, since outside air should not be as toxic as the cabin air.

We know a case where a 12-year old car still smelled almost like new. The owner never opened a window and ran the fan on recirculation all the time.

### **Long term offgassing**

The second "lazy" method is to simply let the car sit in the sun with open windows for a long time. This could take a year; it might take even longer.

Heat and fresh air are essential, so this won't work well inside a garage.

The rain is kept out by installing rain guards on every window, which can then be kept open all the time. Rain guards are easy to install and cost little.



*Car with open windows protected by rain guards.*

Remove the car battery or install a trickle charger to keep the battery alive. A solar panel can do the job if it is big enough (10 watts or more), and has access to sunshine almost daily.

You might want to click the seat belts as if someone is sitting in the car. That way the belts can be offgassed too.

If you have to park on the street where you live, this may still be possible, as the windows are only open a little bit. Otherwise ask someone if you can park in their driveway for a year. You may even be able to rent such a spot.

### **The more laborious methods**

So you are not able to do the "lazy" methods, or they were not enough to make the car tolerable. Fortunately there are many more options to consider.

#### **Remove unneeded seats**

Some people have removed the rear seat and the passenger seat, and kept them in a shed or garage. This greatly reduces the chemical fumes generated inside the car. The seats can later be re-installed when they have offgassed or be left out until the car is sold again.

The same goes for the removable floor mats.

#### **Carpets, headliner and cloth seats**

The headliner, carpets and cloth seats contain a toxic soup of chemicals and heavy metals, including plastics, flame retardants, foams, glues and much else.

In a new car the fibers will be covered by a stain repellent. In a used car the fibers will often have absorbed fragrances and other chemicals from the people who sat in the car.

Some chemicals can be washed and vacuumed away, while others simply have to offgas over time.

A steam cleaner is the most effective method. It applies steam with a detergent in it and then sucks it all up again. The heat really helps with loosening and volatilizing things. You can run it with just water or use a tolerable detergent, such as AFM Super Clean. For more difficult cases, consider first cleaning with a strong car shampoo and then do it again with a milder detergent to remove residue of the strong shampoo.

A steam cleaner can be rented, but you may need to clean it first to get rid of residue from toxic cleaners.

Make sure to do any steam cleaning on a warm dry day, where the car can dry out quickly to prevent mold from growing in the upholstery.

The cleaning must be done outdoors, not in a garage, as toxic fumes and toxic dust will be sent into the air. Also consider wearing a mask to protect yourself, such as an N95 type or a respirator.

If a steam cleaner is not possible, consider using a shop vacuum with an extractor attachment. If possible, also add a HEPA filter on the shop vacuum to limit the dust it sends out into the air.

### **Plastic panels and plastic seats**

Make a paste of water and baking soda (also called sodium bicarbonate, natrium bicarbonate or natron). Pack it wet on the plastic panels and seats. Let fully dry so it easily flakes off. Then vacuum it away. Then wash the surfaces with vinegar, and rinse off after ten minutes or so.

Baking soda (natron) is alkaline and vinegar is acidic, so they work on neutralizing different chemicals.

You may need to do several treatments alternating between the baking soda paste and the vinegar.

This procedure works on the surface of the plastics. It can remove chemicals deposited on the surface and perhaps also create a thin neutralized layer on the plastic itself. But it won't detox the plastic in depth, so those fumes will continue to come out over time.

### **Grease on seat rails**

The rails that sit under the movable seats are greased to allow easy movement. The chemicals in the grease are detectable in the cabin air in new cars (Chien, 2007). The grease can be washed off with warm soapy water and replaced with a non-toxic grease, such as olive oil or a non-toxic skin jelly (such as Un-petroleum).

### **Ventilation system**

Turn on the ventilation system. If it smells like chemicals, try to douse it with baking soda (called natron in some countries). This is done by setting the system to get full fresh air from the outside. Turn the fan on high. Then dump copious amounts of baking soda into the air intake, which is usually right in front of the windshield. While dumping the baking soda, move the selector that determines where the air goes (i.e. by the feet, out from dash, etc.).

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Once distributed, let the white powder sit for a while. It will likely coat the seats and floor of the car. Then vacuum it all up.

If the air coming out of the vents smells moldy, there is probably little you can do about it. But the method with baking soda is worth a try.

Some people have covered all air vents with aluminum tape and never turned on the ventilation fan. Of course, then there is no heating or cooling available (wear appropriate clothing).

### **Ventilator fan motor**

In new cars, the fan motor can smell when it gets hot. Running it for a couple of days should help.

This can be done by connecting a battery charger to the car's battery (low setting is good). Then turn the ignition key so power is on, but the engine is not starting. Leave the windows open while the fan runs. You may even install a small clip-on 12 volt fan to move air through the open window.

A 12 volt solar panel can be used instead of a battery charger if there are people with severe EHS in the household.

If you are doing a radical detox (see later) and have dismantled the console, it may be simpler to remove the fan motor and offgas it outside. You'll still need to run it from a battery with a charger (or solar panel).

### **The trunk**

The trunk is likely to be carpeted and toxic. It should be offgassed as well.

Most cars have air holes between the trunk and the cabin. They tend to be hidden behind the rear seat and under the rear window. These could be sealed with aluminum tape. This also allows for transport of more toxic cargo in the trunk.

### **Ozoning**

Ozone should be used sparingly and cautiously, if at all. It is best avoided if possible.

Ozone is a powerful oxidizing gas which reacts with gases and materials it touches. It can be helpful to neutralize emissions from plastic panels and other materials inside the cabin. But it cannot penetrate materials or really get into cavities.

When ozone comes in contact with another material, the oxidation creates a new chemical compound. Sometimes that makes it benign, sometimes not. In laboratory tests, some chemical fumes were converted into formaldehyde, acetone and other nasties (Singer 2006; Destailats 2006).

Materials that have been ozoned too much are permanently oxidized and can have a nasty smell forever.

Ozone can also destroy soft plastics. Someone who ozoned their car for 24 hours found the door seals were ruined (Accola 1992).

Finally, ozone is very harmful to breathe. It can damage the lungs permanently.

If you need to use ozone, use it a little at a time. Air out the car, then apply some more. And never breathe it in.

## **Phase 2: sealing and covering**

Initially you'd want your car to offgas as fast as possible to get rid of the toxic fumes before you start using the car. When the car has improved to be nearly good enough, it is time to go the other way. The aim of sealing and covering is to slow down the offgassing so you can be inside the car. The chemicals will still come out, but it'll take a lot longer.

If you drive the car with the windows open, you may be ready to drive it with some of these measures.

### **Cover the seats and the floor**

Offgassing from the seats and floor can be reduced by covering them up.

Some people use sheets of polyethylene plastic, since it doesn't smell even when hot. In North America the brand name Tu-Tuff is popular in the MCS community.

Other people have used bed sheets or blankets to cover the seats and floor. That is not as airtight, but still helps a lot.

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We do not recommend using any sort of aluminum foil product because of the reflection of sunlight, which can distract the driver. (Unless covered up by something else.)

There are various sealers for carpets available from AFM in the United States. We have no experience sealing carpeting so cannot comment, but they seem worth a try. Test them out on a small part first to see how you tolerate it, and whether it discolors the fabric.



*Seat and floor covered with polyethylene plastic. One seat is also removed.  
The rear seat is covered by a cotton sheet.*

### **Sealing the headliner**

The headliner is sometimes called a roof liner. It is difficult to seal upside down. Be very careful that any sort of encapsulation is secure so it does not fall down and possibly blind the driver.

Most people leave it as is, though we've seen one person who covered it up with a piece of polyethylene plastic attached by dozens of pins.

A painted-on sealer may work as well.

### **The dashboard**

The dashboard is made of plastic, with soft foam inside, to make it less hazardous in case of a car accident. These materials are often very hot because of direct sunlight through the windshield.

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*AFM Hard Seal product and generic sodium silicate (water glass).*

It is unlikely the board can be removed.

Some people have covered it up using cotton towels or similar. It is best to use something with a medium color to avoid causing glare or absorption of heat.

Some have had good results painting it with a sealer, such as available from AFM (American Formulating and Manufacturing).

In countries where these products are not available, you may try generic sodium silicate (also called "water glass"), though it is water soluble and we are not aware of anyone who has actually tried it for this purpose.

### **Sealing plastic panels**

Some people have sealed the side panels using painted-on sealers, such as AFM HardSeal. Try a little first in an inconspicuous place to see if it stains the plastic.

### **Air filter**

A 12 volt air filter can help with both traffic fumes and fumes from the car. But it is only a help. You can't put an air filter in a toxic car and expect a miracle.

To be of any value it must have a big carbon filter. Most car air filters are only effective for dust and pollen. Some have puny carbon filters that are not of any help.



*Car air filter from E.L. Foust strapped into the back seat.*

The only 12 volt airfilters we know of that have serious carbon filters are made by Aireox and E.L. Foust (both in USA).

### **Stronger measures**

Some people have had to strip the interior of the car. Some did it permanently, while others detoxed the parts and put them back in again later.

The seats can be taken out, perhaps leaving the driver's seat in place. That should not be difficult. Just be sure to unplug all connectors first.

The floor carpeting can be removed down to the metal in some cars. Some people installed a more tolerable type of carpeting and insulation.

The panels around the driver and on the doors can be removed. They are often mounted with hidden plastic clips. Get an auto shop to remove them or buy a shop manual about chassis work. You may need to replace the clips, as they are not sturdy.

Don't forget the headliner.

The removed parts can then be aired out for several months in a garage or shed, while the car is aired out too. This is the fastest way to offgas a car, but it is a lot of work.

Some people have gone even further by stripping the seats down to the metal frame. Some have covered the springs with cotton towels. Others have re-upholstered them using safe materials (Marsh 2002). Denim has worked well for re-upholstering seats as it is durable and doesn't show stains so much.

There is one story where they went as far as replacing the seat belts, wrap exposed wires in foil and much else (Marsh 2002).

A few people do end up driving around in a stripped car (we have seen three). It looks eerie on the inside, but it can't be seen from the outside unless the person is right next to the car. A stripped car will have more road noise inside and it will be hotter in the sun and colder in the winter.

### **More information**

More articles about modifying cars for the environmentally ill are available on [www.eiwellspring.org/vehicle.html](http://www.eiwellspring.org/vehicle.html).

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