



# Indoor Air



# BIO-COMPATIBLE INDOOR AIR SOLUTIONS

## Air Quality Guide for Indoor Living Environments

---

NOT MEDICAL ADVICE. GUIDE PROVIDED FOR INFORMATIONAL  
PURPOSES ONLY.

All rights reserved. No part of this guide may be reproduced or shared in any form or by any means, electronic or mechanical. This includes reprinting, photocopying, recording and any information storage and retrieval system, without permission in writing from the author.



# TABLE OF CONTENTS

Introduction ..... 1

## **Pollution Factors**

→ Mold, Paint ..... 2

→ Pressed Wood Products  
Carpets and Rugs ..... 3

→ Mattresses ..... 4

→ Our Mattress  
Recommendations ..... 5

→ Combustion Sources, Dust ..... 6

→ Aromatherapy Interventions ..... 7

→ Household Products,  
Cooking ..... 8

→ Cooking Strategies ..... 9

Air Ion Balance ..... 10-12

Humidity ..... 13-15

Filtration ..... 16-19

Ventilation ..... 20-22



# TABLE OF CONTENTS

|   |             |
|---|-------------|
| Introduction  | ..... 1     |
| Pollution Factors                                       | ..... 2 - 9 |
| <i>(Mattress Recommendations found on p. 5)</i>         |             |
| Air Ion Balance   | ..... 10-12 |
| Humidity  | ..... 13-15 |
| Filtration  | ..... 16-19 |
| Ventilation   | ..... 20-22 |
| Dimmers   | ..... 17    |
| Candle Light and Fire                                   | ..... 18-19 |
| Sunlight  | ..... 20-29 |
| Near and Far Infrared                                   | ..... 30-35 |
| Spectro-Chrome Therapy                                  | ..... 36    |
| Screens   | ..... 37-38 |
| Bedroom Lighting  | ..... 39    |
| Lighting Matrix w/Links +<br>Strip Lights & Flashlights | ..... 40-42 |



# INTRODUCTION

---

## **The Surprising Truth About Indoor Air**

Here are some eye-opening facts you may not know:

- Indoor air pollution is the 6th leading global health risk factor – responsible for more deaths than alcohol use. And yes, that's just from breathing "normal" indoor air.
- Most VOCs (volatile organic compounds) come from us – the cleaning, cooking, and personal care products we use every day while we're home.
- We often think pollution is an outdoor problem – traffic, factories, industrial smog. But the truth is indoor air can be over five times more polluted than outdoor air.

Air quality inside your home is shaped by five key factors:

1. Pollution (chemicals, VOCs, particulates)
2. Ion balance (positive vs. negative ions)
3. Humidity (too dry or too damp both cause issues)
4. Filtration (capturing contaminants before you breathe them)
5. Ventilation (bringing in fresh air and moving stale air out)

# Pollution

Of course the best way to limit exposure is to limit sources of indoor air pollution. Building materials matter but for the purposes of this blueprint we'll stick to factors that impact existing spaces.

- **Mold**

The truth is that mold is everywhere but concentrations and types of molds vary. Mold proliferation can be a huge issue for your health that requires remediation professionals to address it. If you suspect that you may have a mold problem this website will guide you through exactly what to do:

<https://changetheairfoundation.org/> This is a great resource for everything mold related.

- **Paint**

Zero VOC paint doesn't actually mean what you think it means. There are very specific legal definitions around VOCs. This is why when you buy so-called zero VOC paint it still reeks. The VOC label refers to base paint only and doesn't take into account colorants, which often contain VOCs. These paints often also contain other harmful chemicals such as ammonia, formaldehyde, acetone, glycol ethers, biocides and fungicides. These off-gas as well. Therefore we recommend that when you decide to repaint your home, **stop using liquid plastic** on your walls and switch to paint options like: **limewash, plaster, or mineral paint like Alkemis** (<https://alkemispaint.com/>).

- **Pressed Wood Products**

Particleboard, plywood and MDF products often off-gas formaldehyde. This off-gassing is strongest in the first two weeks but can continue to release VOCs into the indoor air for up to 5 years.

- Use solid wood furniture whenever possible
- Let new items air out in the garage, outside, or in another well ventilated area for at least 2 weeks
- Use fans, open windows, and HEPA filters if pressed wood items must be indoors.
- Avoid compressed wood in bedrooms and nurseries.
- Buy CARB Phase 2 compliant or NAF (no added formaldehyde) furniture when possible.

- **Carpets and Rugs**

Use rugs made out of natural fibers (wool, cotton, jute, sisal, hemp, coir) with natural latex backing or no backing at all. Undyed wool is naturally stain resistant and antimicrobial.

- Undyed or plant dyed rugs are ideal.
- Avoid chemical stain stain-proofing treatments and flame retardants.
- Relevant certifications: GOTS, OEKO-TEX Standard 100, Greenguard Gold

- **Mattresses**

Mattresses tend to be the highest off-gassing items in our homes, a disturbing fact when we spend so much of our lives in direct contact with our mattress. What you should consider when looking for a non-toxic mattress (from materials perspective):

- Organic materials including both internal and external components (organic cotton, organic wool, horse hair [no horses harmed], organic Dunlop latex, )
- No adhesives, no flame retardants, fully needle tufted
- Metal coil free for EMF sensitive individuals (metal coils can act like antennas)
- A word on Talalay latex: it could be ok but it's not our preference from materials perspective because this type of natural latex has to undergo more processing. It often contains more synthetic additives and curative agents. With that being said, this type of latex is what can create a softer surface, so it has its uses.
- A word on **latex allergies**: Most latex allergies are **contact allergies**, triggered when your skin touches **natural rubber proteins**, like in latex gloves or balloons. With a latex mattress, the latex core is **fully enclosed** in layers of fabric – **usually organic cotton and wool** – so there's **no direct contact** with the latex itself. Additionally, natural latex used in mattresses (especially **GOLS-certified latex**) goes through multiple rinsing stages during processing, which **removes most of the allergy-triggering proteins**. The two important caveats we have are: 1) if someone in your household has an anaphylactic latex allergy, use discretion on whether to buy a latex mattress 2) some cheaper latex blends contain **synthetic latex or additives** that might cause other types of sensitivities, but **100% natural Dunlop or Talalay latex** is rarely an issue.



**Our mattress recommendations** (please note that most of these brands also carry crib mattresses and pillows):

- **Budget Option: My Green Mattress** (\$1529 for Queen)  
<https://www.mygreenmattress.com/product/natural-escape/>
- **Wool and Latex Mattress without** Pocket Coils for EMF sensitive individuals or higher ambient EMF levels: Soaring Heart Organic Latex Mattress (\$2799 for Queen) <https://soaringheart.com/collections/organic-latex-mattress/products/organic-natural-latex-mattress>
- **Fully Customizable** Split Side Option with Latex, and Coils: **Naturepedic** any of the EOS Series (3K-5K for Queen) <https://www.naturepedic.com/eos-classic-organic-mattress-buy?466=1090>
- **Latex Free** Option: Organic cotton japanese mattress known as shikibuton (placed over a tatami mat or special platform bed):  
<https://soaringheart.com/collections/shikibutons/products/organic-cotton-wool-shikibuton?variant=39685341386>
- The **Creme de la Creme** Option: Hastens (15K+)  
<https://hastens.com/> If you're interested in this option reach out to us for a privately brokered price...we can really hook you up.

- **Combustion Sources**

Some of the most common indoor air pollutants come from things that burn. These include:

- Cigarette smoke - a major source of toxic chemicals that linger in the air and on surfaces.
- Gas leaks and stoves - natural gas combustion can release carbon monoxide, nitrogen dioxide, and other harmful byproducts.
- Fireplaces and wood stoves - without proper ventilation they generate fine particulates and carbon monoxide.

- **Dust**

Household dust is not just “dirt”. It is a mix of organic debris (skin cells, hair, fibers), pesticide residues, flame retardants, phthalates from plastics, heavy metals, mold spores, pet dander, and outdoor pollutants. Dust acts like a chemical sponge, with airborne toxins binding to dust particles. They then get ingested and inhaled.

- Vacuum smarter and often. Use sealed HEPA vacuums like Miele (<https://amzn.to/4iu5f6u>) **with bags** (we prefer the bags to keep the dust contained on disposal). If you have a different Miele model you can upgrade the filter without replacing the model. There are other brands that offer this type of functionality as well just look up if there’s a HEPA filter available.
- Vacuum carpets, rugs, upholstery and baseboards 1x/week.
- Ditch carpeting when possible as it is a dust trap.
- Wet dust, don’t dry dust. Dry dusting re-aerosolizes particles. Use a damp microfiber cloth like this <https://amzn.to/4iwN14n>

- **Aromatherapy Interventions**

Scrap all scented plug-ins and aerosols. The first step is to eliminate any product that uses “fragrance” as an ingredient.

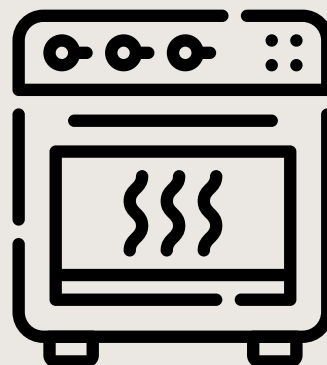
- Use candles made from 100% beeswax (naturally honey scented so no added fragrance needed):  
<https://get.aspr.app/SH14NI>
- Use beeswax candles scented with pure essential oils:  
<https://fontanacandlecompany.com/collections/bestsellers>
- Clean ingredient hydrosols: <https://get.aspr.app/SH14Nm>
- No burn scents: wax melts  
(<https://fontanacandlecompany.com/collections/non-toxic-wax-melts-fontana-candle-co>) melted in electric warmers  
<https://amzn.to/3GfMWEH>
- Non-toxic incense: Store bought incense has all kinds of additives that are not great for your lungs. Our recommendation is to use these pure natural resins or herbs instead: <https://get.aspr.app/SH14OE>
- Use a diffuser if you'd like to work with high quality pure essential oils directly but be mindful of what oils you're using and their specific properties. For example, usually the following oils are well tolerated by most people: Lavender, Roman Chamomile, Frankincense, Sweet Orange, Cedarwood, Sandalwood. This is a good source of quality oils: <https://get.aspr.app/SH14O9> Make sure to diffuse oils intermittently (30-60 min on at a time) and in well ventilated spaces. Not recommended for use around babies.
- Amazon diffuser recommendation for essential oils:  
<https://amzn.to/3RjR48G>

- **Household Products**

This is of course a whole separate section for the very reason that it has the potential to be very disruptive to human health through dermal and airborne contamination. More on this can be found in the ***Cleaning Products Guide***.

- **Cooking as a source of air pollution**

Fine particles released during cooking, especially when frying or grilling, can penetrate deep into the lungs and cause respiratory issues. Released from heated oils and certain cooking methods, VOCs can cause headaches, nausea, and long-term health effects. Polycyclic Aromatic Hydrocarbons (PAHs) formed during high-temperature cooking, especially when fat drips onto open flames, are known carcinogens. Nitrogen Dioxide (NO<sub>2</sub>) and Carbon Monoxide (CO) are some of the pollutants that can be generated from gas appliances. NO<sub>2</sub> is emitted from gas stoves and can exacerbate respiratory conditions like asthma, while carbon monoxide is a more serious emission from a faulty gas appliance (can be deadly).





## Strategies for minimizing air pollution from cooking:

- Enhance Ventilation. Use Range Hoods: Operate a vented range hood that exhausts air outside during and after cooking. Facilitate cross-ventilation by opening windows and doors to disperse pollutants.
- Opt for Cleaner Cooking Methods: air frying, boiling, and baking. These methods produce fewer pollutants compared to frying or grilling. Refer to the cookware section for our air fryer recommendations because most models on the market have toxic coatings on the components.
- Cooking at lower temperatures reduces the release of harmful emissions.
- We often don't think of using an air purifier in the kitchen but it's actually one of the most important rooms to use an air purifier in. See our recommendations below for specific models.
- Regularly clean ovens, stovetops, and range hoods to prevent buildup that can emit pollutants. Ensure that filters in hoods and purifiers are cleaned or replaced as recommended.
- Utilize indoor air quality monitors to detect pollutant levels and take timely action. This is our very inexpensive option recommendation. Read the instructions carefully to get accurate results.

<https://amzn.to/44dKAjD>

# Air Ion Balance

Air ion balance is one of those quietly powerful factors that can influence how we feel in a space, even if we're not consciously aware of it. **Air ions** are charged particles in the air. They can be **positive** or **negative**, and they form when molecules in the air gain or lose electrons—often triggered by sunlight, water movement (like waterfalls or showers), friction, or electrical devices.

- **Negative ions (anions):** Oxygen atoms with an extra electron. Found in abundance in natural environments—forests, oceans, mountains, and after lightning storms.
- **Positive ions (cations):** Often come from pollution, electronics, and synthetic materials indoors. These dominate urban and enclosed indoor environments.

# Why Does Ion Balance Matter?

Negative ions are linked to:

- Better oxygen absorption in the blood.
- Enhanced serotonin regulation (mood, energy).
- Decreased allergens and airborne bacteria.
- Improved sleep and clarity.

Positive ions contribute to:

- Headaches, fatigue, anxiety
- Respiratory irritation
- Poor sleep or sluggishness

Many modern homes have an **overload of positive ions** due to:

- Electronics (WiFi, TVs, computers)
- Synthetic furniture and fabrics
- HVAC systems that strip humidity

# Rebalancing:

Here are ways to increase negative ions and neutralize excess positive ions:

Nature-based strategies:

- **Open windows**—especially after rain or during storms
- **Indoor water features** like fountains or water walls
- **Houseplants** (refer to the plant guide bonus)
- **Earthing/grounding mats** (reduces static and electrical stress)
- **Himalayan salt lamps**

Technology-based:

- **Ionizing air purifiers** (like our Air Oasis recommendation below)
- **Earthing/grounding mats** (only if you can ground into earth directly or have access to a clean grounding line)
- **Beeswax candles** (release negative ions while burning)
- **Infrared saunas** and **red light therapy** can shift energetic balance too

What to reduce:

- Overuse of **synthetic upholstery, carpets, curtains**
- **Scented plug-ins**, aerosols, and synthetic candles
- **Unnecessary screen time** or sleeping near electronics



# Humidity

While most people have some awareness around the impact of humidity on respiratory health, there's less of an association between humidity levels and air quality. 40-50% relative humidity is the sweet spot that's comfortable for the human body, yet not ideal for mold growth. Anything over 60% is conducive to mold and dust mites and not as comfortable for the respiratory system. A very inexpensive (\$7) meter like this <https://amzn.to/4jMApXt> is useful to keep on hand but also you may just want to use a meter that tracks both air quality and humidity (\$35) <https://amzn.to/44dKAjD>

Humidity affects air quality by influencing:

## Particulate Matter

- Dry air allows particles like dust, pet dander, and allergens to stay suspended longer.
- Proper humidity helps **weigh them down**, so they fall out of the air more easily.

## Particulate Matter

- Dry air allows particles like dust, pet dander, and allergens to stay suspended longer.
- Proper humidity helps **weigh them down**, so they fall out of the air more easily.

## Biological Contaminants

- **High humidity** is a breeding ground for:
  - Mold spores
  - Mildew
  - Bacterial growth
- Contaminants like these reduce indoor air quality and can exacerbate allergies & asthma

## Off-Gassing & VOCs

- Some **pressed woods, paints, and plastics** off-gas **MORE** in **low humidity**, while high humidity can **slow dispersion** but encourage VOC buildup in unventilated spaces.
- Balanced humidity + ventilation = best defense.

## Recommendations:

- Use a **hygrometer** to monitor humidity
- Aim for **40-50%** relative humidity for comfort and health.
- Use natural **humidifiers** in dry months:
  - **Houseplants** (naturally humidify and clean the air)
  - Drying laundry indoors
  - **Clay or ceramic passive humidifiers** that slowly release moisture without power (these work well for creating more localised pockets of humidity i.e. next to your head on a nightstand when you sleep or close to plants that need more humidity):  
<https://amzn.to/42tFfUO>
  - Boiling water on the stove
  - If you must use an electric humidifier go for an **evaporative** humidifier models that are better for mold prevention and particulate air pollution  
(<https://amzn.to/3RAZnxb>)
- Use **AC** to make the air dryer in wet months.
- Ventilate well—especially **bathrooms, kitchens, and laundry areas**
- Recommended Air Quality and Humidity Monitors:
  - Budget hygrometer: <https://amzn.to/4jMApXt>
  - Budget hygrometer + air quality monitor:  
<https://amzn.to/44dKAjD>
  - Professional grade air quality monitor:  
<https://amzn.to/3EJ3LqU>

# Filtration

This is a huge piece of the air quality equation. We have some mechanical air purifier recommendations but indoor plants also greatly contribute to indoor air filtration. When it comes to air purifiers, criteria we considered includes: level of filtration (the particle size that gets filtered out), CADR (clean air delivery rate), ease of maintenance, range of sizes, and noise level.

## Recommendations

Our air purifier recommendations are as follows:

1. Our top pick for a **flexible range** of models with excellent filtration adaptable to different room sizes (check the sq footage specs to determine what the best option is for each room) is **Air Oasis** (prices start at \$439). This brand eked out a victory over the super popular AirDoctor despite being in a similar price range for the following reasons: we love its super low maintenance operation and long lasting filters (up to 24 months!). It's also the quietest of all the purifiers, which is particularly great for bedroom use. Its medical grade HEPA filters are fine enough for virtually any environment, though AirDoctor filters are slightly more sensitive. Our caveat is that we endorse Air Oasis with the **wifi chip removed** (super easy to do since these units are specifically designed to have removable chips). Average annual filter cost ranges \$45-\$114 depending on the model, making it one of the lowest filter cost models.  
<https://www.airoasis.com/>



2. Our top **low maintenance** pick for **larger spaces** covering up to around 1000 sq feet is **Jaspr Pro** (\$1199) air purifier. This is the set it and forget it commercial grade option (at least for 6 months before the filter has to get changed)! The filtration capacity is excellent at 0.150 microns, it covers a large area, and it's very quiet. It has a high CADR score of 600 cubic feet per minute, positioning it among the top performing residential models. Replacement filters are auto-shipped every 6 months and run \$400/year. Jaspr also has an unbeatable **LIFETIME warranty**. As long as your filter subscription stays active, if your Jaspr malfunctions you will get a new one no questions asked the company will ever cover the cost of shipping. <https://jaspr.co/>
3. Plants are nature's air purifiers and this is no different in indoor environments.

## MERV Filters

Is a higher rating always better?

You're probably familiar with these filtered screens you can buy anywhere from hardware stores to grocery stores. They passively rest on your HVAC unit...in theory filtering the air that gets circulated through your home. Here we'll take a closer look at what those filters are all about including selection and maintenance questions.

**MERV** stands for **Minimum Efficiency Reporting Value**. It's a standard rating system that tells you **how effective an air filter is at trapping particles** from the air (like dust, pollen, mold spores, bacteria, etc.). **The higher the MERV number, the smaller the particles** it can capture – and the **more** it captures overall.

This filtration screen is in fact necessary for the following 2 reasons:

- It filters out at least some allergens and pollutants
- It protects your HVAC system by keeping dust and debris from building up inside the ducts, coils, and motor, making your system last longer.

## How MERV Ratings Are Organized:

| MERV Rating        | Captures  |
|--------------------|---|
| 1-4                | Large dust, carpet fibers                               |
| 5-8                | Pollen, mold spores, dust mites                         |
| 9-12               | Fine dust, pet dander, some bacteria                    |
| 13-16              | Tobacco smoke, sneeze droplets, viruses, fine particles |
| 17-20 (HEPA range) | Ultra-fine particles (not typical for home HVACs)       |

This begs the question: **Is a higher rating always better?**

Turns out that there is a sweet spot in the **8-13 rating range** for residential use. For higher levels of filtration, freestanding air filters we recommended in the previous section of this document are the better solution.

Higher MERV = finer filtration, **but** it can also **restrict airflow** if your HVAC system isn't designed for it.

Too much restriction can:

- Strain the system
- Increase energy bills
- Shorten HVAC lifespan

How Often Should MERV Filters Be Changed?

- **MERV 8-11:** Every **2-3 months**
- **MERV 13-16:** Every **1-2 months**, especially if dealing with pets, mold, wildfire smoke, chronic illness
- If your home is very clean and you have low pollutant load, you might stretch it a little longer – but **checking it monthly** is best practice.

# HVAC Cleaning and Maintenance

Think of your HVAC system and ductwork as the respiratory system of your home. If environmental pollutants like mold spores, fungal particles, or mycotoxins are present, they can travel from room to room through the airflow. As the system circulates air, it can end up spreading these contaminants throughout the house, leading to cross-contamination of different spaces.

- If your HVAC system is properly **sealed, filtered, and maintained**, and there's **no visible mold, dust buildup, or musty odor**, routine duct **cleaning may not be needed**.
- The **EPA** states that there's **no evidence** regular duct cleaning improves air quality *unless* there's contamination present.

## ***When it is a good idea to book a duct cleaning:***

- You've recently had construction or renovations (lots of dust/debris)
- You have pets that shed heavily
- Your filters clog quickly or the system seems less efficient
- You smell mold or musty odors when the system runs
- Visible buildup inside vents or registers
- You have family members with asthma, allergies, or respiratory issues

**Ductwork cleaning:** How thoroughly your ductwork can be cleaned depends on several factors, including the duct design, its age, material, overall condition, and the nature of the contamination. Flexible ducts are especially challenging to clean effectively. In some situations, it may actually be more practical—or cost-effective over time—to replace parts of the system or even the entire unit (if you had a mold remediation situation for example). Find more information here for what to look for if you do need to book an HVAC cleaner (the document you want is called *HVAC and Duct Cleaning Basics*):

<https://changetheairfoundation.org/free-downloads/>

# Ventilation

Poor ventilation traps all air pollutants indoors. Thus ventilation is key, but it needs to be executed in a smart way.

## Best Practices for Home Ventilation

### 1. Open Windows Strategically

- Best times:
  - **Early morning** (before outdoor pollution builds up)
  - **Late evening** (after traffic and ozone levels drop)
- Duration:
  - Aim for **15-30 minutes twice daily** for a full air exchange.
  - Longer if outdoor air is clean and humidity/temperature levels are safe.
- Ideal conditions:
  - When outdoor **PM2.5 levels are low** (use your meter to check)
  - Not during **pollen season, wildfire smoke, or high ozone alerts**

In the absence of a meter you can use an **air quality app** (like IQAir or AirVisual) to track the best times to ventilate based on your zip code.

### 2. Cross-Ventilate

- Open **windows on opposite sides** of the home (or room) to create a **natural breeze**.
- Open **interior doors** to let fresh air circulate through the entire house.

### 3. Use Exhaust Fans Intentionally

- **Bathroom fans:** Run during and 15-20 minutes after showering to prevent moisture buildup.
- **Kitchen hood fans:** Use every time you cook (especially with gas or high heat) to vent pollutants.
- Make sure both vent **to the outside**, not just recirculating air.

### 4. Air Out New Items

- Let **furniture, rugs, mattresses** (if foam based), and **new materials** off-gas outdoors or in a garage before bringing them inside.
- Open windows or use exhaust fans if you must open packaging indoors.

### 5. Maintain Mechanical Ventilation Systems

- For homes with **HRV (Heat Recovery Ventilators)** or **ERV (Energy Recovery Ventilators)**:
  - Change filters regularly
  - Ensure system is balanced to not pressurize or depressurize the house
  - Run it at **low constant speed** or scheduled intervals

## 6. Use a CO2 Monitor as a Ventilation Clue

- **CO2 buildup = stale air.** If your monitor regularly hits **1,000+ ppm**, you likely need better ventilation.
- Ideal indoor CO2 levels: **400-800 ppm**

## 7. Avoid Ventilation During:

- Wildfire smoke
- High pollen counts
- Extreme humidity
- Use **high-efficiency air purifiers** during these times instead.