AIR

Indoor air quality can be 10 times more toxic than outside.
VOC, Dust particulates, smoke from gas stoves, formaldehyde from furniture and carpets. Indoor air filtration is essential to improve and maintain health.

In certain cases, air filtration may not be just enough, in which case certified inspectors may be required and remediation needs to be done. I will discuss this further in my next blogs on certified inspectors and agencies in Singapore.

So what's the solution?

#1 Reduce Sources of Exposure

- **Reduce the sources of exposure you bring into your home.**
- Ditch all scented cleaning and personal care products. Say "No" to fabric softeners and dryer sheets.
- No scented candles or air freshers
- Let go of perfumes and colognes (the new second hand smoke)
- Avoid all stain resistance furniture and carpeting (PFAS nightmare)
- Ensure mold and radon are not issues in your home
- Make sure your stove has a vent that move the air outside your home.

#2: Choose a Good Air filtration system

When it comes to air filters, it is very confusing to choose from range of products that are available, technology and the pricing.

I have compiled the work here that will help you decide the best filtration methods for your circumstances.

Air Filters- technology :

How Air filters are rated (CADR, CCM vs HEPA). This article essentially explains why the traditional rating system is not helpful and why HEPA filtration is important. 2nd Article.

As with water filters, there are several technologies that get used in air filtration:

1. HEPA - pleated random fiber "paper" that captures particles

- HEPA filters vary wildly in effectiveness depending on the tightness of the pores and how tightly sealed the filter is within its unit. Some can filter down below the micron level, some just catch larger dust particles.
- HEPA language is not standardized and the various terms don't necessarily mean any standard has been met
- Generally HEPA is for catching particles above a certain size (whatever the particular filter is built for)
- They don't catch airborne chemicals (VOC's)

1. Activated carbon - binds charged molecules (including VOC chemical gasses)

2. Charge capture plates - metal plates magnetized by charging with electric current - particles with opposite charge will cling to plates (until they are saturated). Usually generate ozone. Can miss lots of particles.

3. Ionization - most create ozone - which does kill things, but will also damage lung cells if concentrations are high enough to smell the ozone. I generally do not recommend these due to risk of respiratory irritation or damage.

4. I like these articles online; they do a good job of explaining the different types of filter technology, what each is good for and where each falls short. (Note that these links are to companies that sell filters)
    - https://www.airpurifiers.com/pages/hepa-is-key-for-air-purifiers
    - https://www.airpurifiers.com/pages/air-purifiers-activated-carbon-technology
    - https://molekule.com/blog/best-air-purifier-for-volatile-organic-compounds-vocs/

Types of Air Pollutants

Particles

Dust, pollen, mold spores, mites, insect feces
Fires and car exhaust (traffic) produce some particulates called POC (products of combustion)

VOC

Volatile Organic Compounds
Toxic gasses that evaporate off of: new paint, new carpet, new cabinets, new foam furniture
Also created by fires and car exhaust.
Many VOC's produce an obvious odor, some are odorless

Toxic mold spores and other microbes present in water damaged buildings can release VOCs that affect health more than the spores themselves (VOCs are the main cause of mold related illness)

Smoke

Produces a combination of VOC and particulate

Infectious agents

Bacteria, virus, mold, etc

How to know what air filter technology you need?

Technology	Good For	Not Good For
HEPA	Particles, highest quality will catch some infectious agents	VOC, does not kill infectious agents
Activated Carbon	VOC's, large particles, heavier carbon blocks adsorb more VOC faster	Small particles, bacteria, virus
Ozone	Kills bacteria, virus, mold spores, also kills lung cells. Not for use in room while occupied	VOC, particles, breathing
UV (Ultraviolet light)	Slowly kills bacteria, virus, mold, breakdown VOC	Quickly removing anything
Electrostatic plates	Binds particles, dust, pollen, mold to plate that can be cleaned	Does not kill infectious agents or mold, does not absorb VOC

Recommended Air filters/purifiers available in Singapore:

Here's a curated list of **air purifiers with True HEPA + activated carbon**, **no ionizer**, **no CADR-based marketing**, and optionally **with electrostatic filtration**, that are either:

✅ Available in Singapore**, or**

✅ Can be imported with reasonable logistics and support

1. IQ Air- Expensive
2. Austin Air Health Mate: Moderately expensive.
3. Dyson Purifier Cool air purifier PC1 TP11- Relatively cheaper