

# It's All in the Air

If you knew what we know about indoor air, you'd stop breathing completely



## Here's a few hard facts about indoor air quality (IAQ):

Studies by the US Environmental Agency (EPA) have shown that indoor air contains up to a 100 times more pollutants than outdoor air.

- We spend an average of 22 hours a day indoors either at work, at school or at home. 91% of air we breathe every day comes from the indoors.
- According to the World Health Organisation (WHO), indoor air pollution from biological agents related to damp and mould increases the risk of respiratory disease in children and adults by 50%.
- The Natural Resources Defense Council released a report that phthalates, a type of chemical found in some air fresheners, are able to disrupt hormone levels which can lead to gender bending in male children and testicular cancer in adult males.

### Volatile Organic Compounds (VOCs)

Organic chemical compounds which can affect the environment and human health. Studies have shown that prolonged exposure to low concentrations of VOCs may have adverse health effects on the respiratory systems.

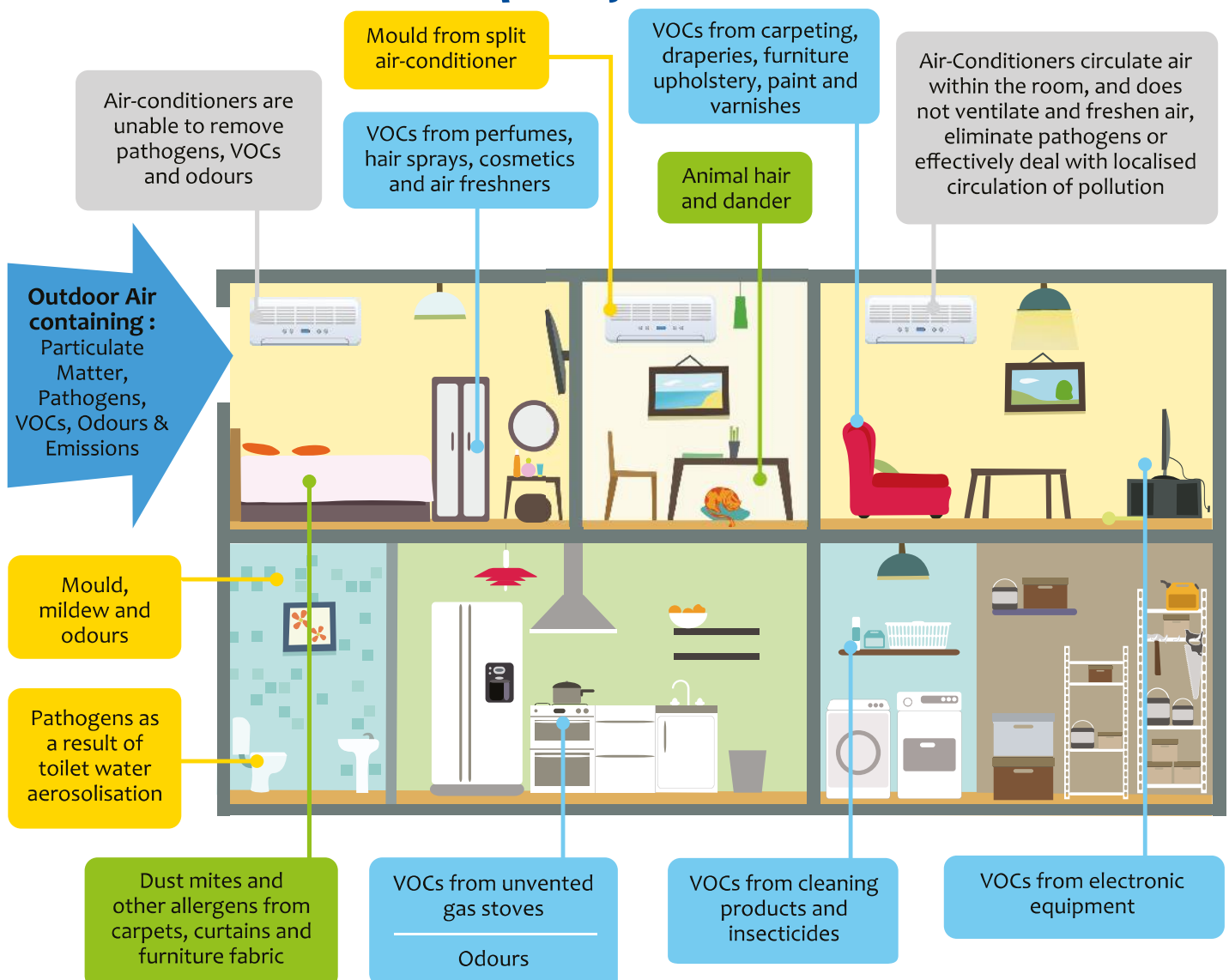
### Particulate Matter (PM)

Microscopic solid matter suspended in the air. Larger particles can be filtered through the nose and throat. But microscopic particles can penetrate the deepest part of the lungs and even the brain. Increased exposure to PM are linked to health hazards such as heart disease, altered lung function and lung cancer.

### Pathogens

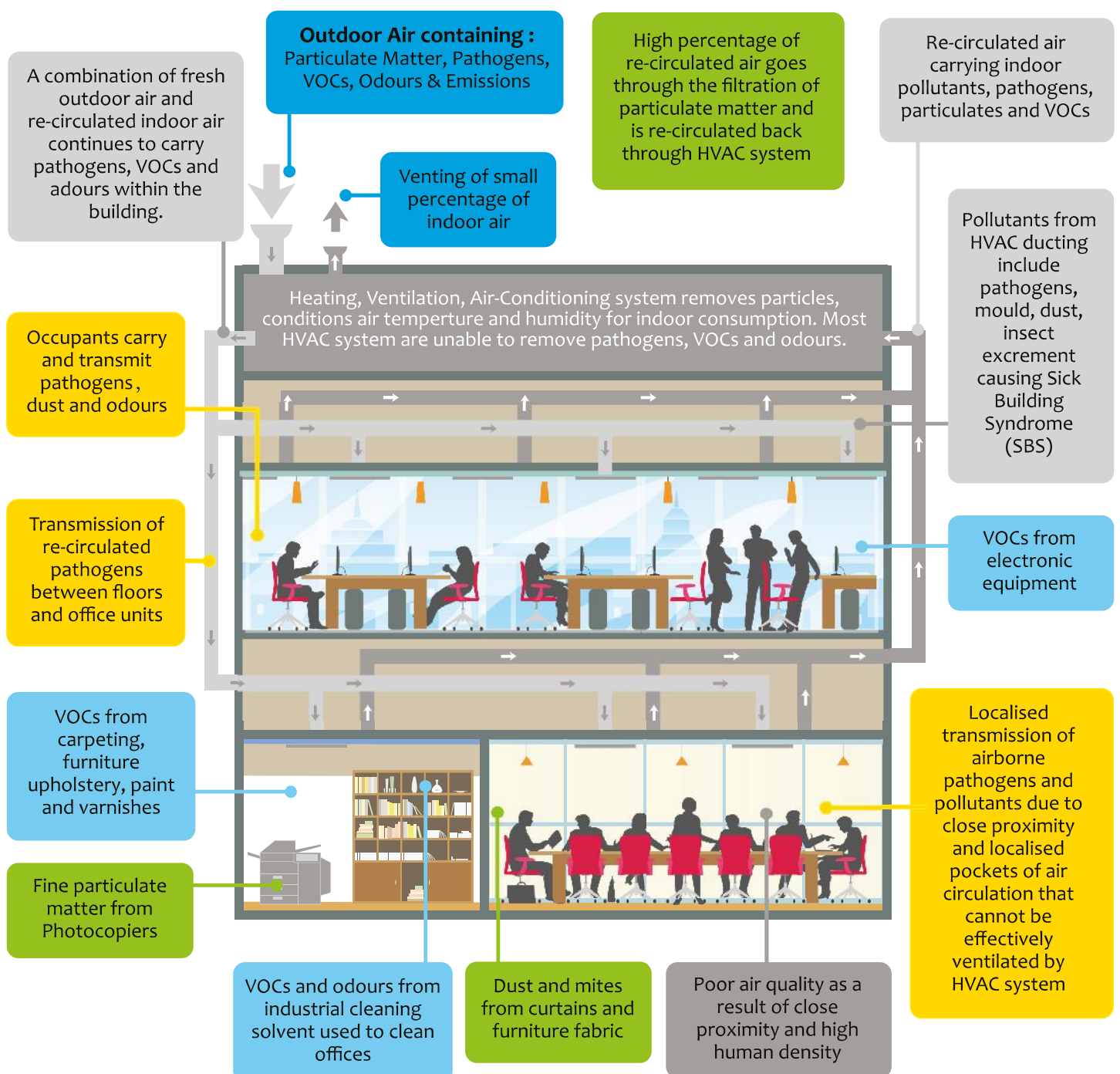
Infectious biological agents such as viruses, bacteria, fungus and allergens. Some common human pathogens are tuberculosis, influenza and SARs. Dust mite excretion, pollen, dander, mould are common allergens that may cause severe allergic reactions, eczema, and asthma.

## Air Quality at Home



- The WHO estimates 300 000 lives can be saved every year by the reduction of just one type of pollutant.
- Exposure to particulate matter reduces the life expectancy of an exposed person by a year due to increased risks of cardiovascular and respiratory diseases.
- Poor IAQ also results in asthma and allergy problems, serious effects on brain and neuro-functions and cancers, such as multiple myeloma, which is linked to airborne carcinogens.
- Poor IAQ affects the performance of workers and school children in the areas of concentration, calculation and memory. As much as 50% of the workforce may be subject to reduced work performance due to Sick Building Syndrome (SBS).

## Air Quality at Work



***The information about IAQ is clear.  
It is time to take action, to stop the  
damage and to revitalise your air.***

## **Soma Medical freshens and revitalises the air**

Soma freshens and revitalises the air by improving indoor air change rate, purifying polluted air of pathogens, particulate matters and odours, and dispersing negatively charged ions into the purified air, giving indoor spaces a new lease of freshness and vitality akin to a waterfall in a forest. This is necessary as the air in most indoor spaces contains a high percentage of recycled air with small amount of fresh outdoor air. Modern energy-saving homes which have been designed to prevent heated or cooled air from escaping also prevents fresh air from entering. With freshened indoor air, occupants will feel more alert and energetic, and will be able to better concentrate and perform at their tasks.

## **Soma Medical deals with localised pollution**

Localised pockets of pollution result from three “dead air circulation” scenarios: First, indoor spaces invariably suffer from dozens of localised air pockets that are not effectively ventilated by HVAC systems; second, entire indoor spaces where air is conditioned by indoor air-conditioning units behave like localised pockets of unventilated air; third, high human density interacting in close proximity mimics a localised pocket of under-ventilated air. These localised pockets of pollution facilitate build-up and transmission of pathogens and allergens. Soma freshens the air pockets by improving the air change rate at these localised pockets of pollution.

## **Soma Medical neutralises pollutant at or near source**

Pollution, infection or vector control should be implemented at source or near to the source to prevent cross-contamination of airstream and surfaces, and transmission to humans, within the same space or across interconnected boundaries as the pollution, infection or vector spreads further from its source. Whether an infectious person is sitting adjacent to the doctor in a clinic or working in an office building with centralised HVAC system, Soma neutralises pollutants and pathogens, and their threats to human health, at or near their sources before they can travel afar.



# The Science of Quality Air

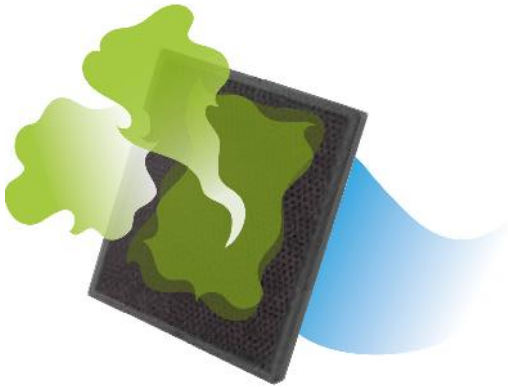
## Particulate Matter Filtration

Particulate matter contain pathogens (viruses, bacteria and infectious organisms), allergens and carcinogens. Mechanical air filters, like High Efficiency Particulate Air (HEPA) filters, remove 99.97% of all airborne particulates of 0.3 microns and above in size. They trap the particles in filters made out of tightly woven fibres. Electrostatic air precipitators use a process called electrostatic attraction to trap charged particles. They draw air through an ionization section where particles obtain an electrical charge. The charged particles then accumulate on a series of flat plates called collectors that are oppositely charged.



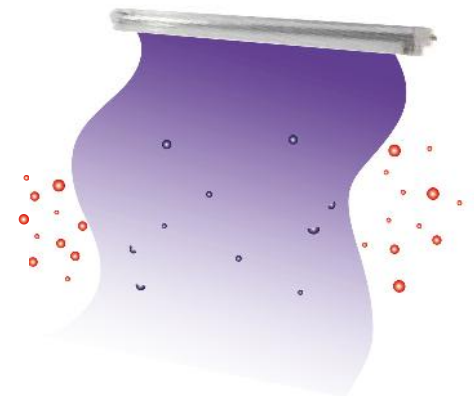
## Gas-Phase Air Filtration

Hundreds of gaseous pollutants have been detected in indoor air. Sources of these airborne volatile organic compounds (VOCs) include tobacco smoke, building materials and furnishings, paints, adhesives, cleaning chemicals and personal care products and household products. VOCs can also come from cooking food, from human, plant, and animal metabolic processes, and from outdoor sources like vehicle emissions. Gas-phase air filters remove gaseous pollutants and their odours by using a material called a sorbent, such as activated carbon, to adsorb pollutants (to collect the gases in a condensed layer on a surface). One gram of activated carbon has an adsorption surface of 500m<sup>2</sup>, the size of a large hall.



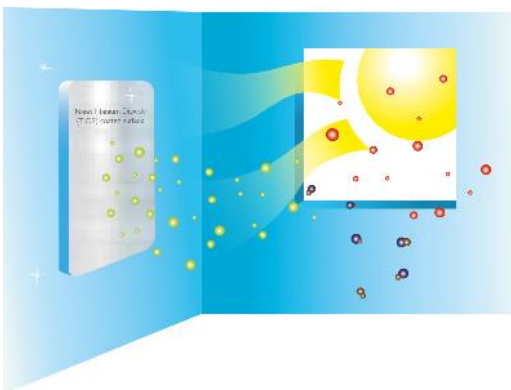
## Ultra-Violet Germicidal Irradiation (UVGI)

C-band ultraviolet lamps, which emit germicidal wavelength of 253.7nm penetrate the outer structure of a microorganism's cell and alter its DNA permanently preventing the replication of biological pollutants such as pathogens and moulds that are airborne or growing on surfaces of heating, ventilation and air-conditioning (HVAC) equipment such as cooling coils, drain pans and ductwork.



## Photocatalytic Oxidation (PCO)

Nano Titanium Dioxide (Nano-TiO<sub>2</sub>) breaks down biological and gaseous pollutants, such as pathogens, allergens, algae, moulds, yeasts, volatile organic compounds (VOCs), odours, and emissions like Nitrogen Oxides (NO<sub>x</sub>), into harmless products by a process called photocatalytic oxidation (PCO). Nano-TiO<sub>2</sub> is the preferred PCO choice due to its strong oxidising power under ultraviolet irradiation, its chemical stability, its low selectivity, the absence of toxicity. When applied as a coating on surfaces and exposed to ultraviolet or ambient light, Nano-TiO<sub>2</sub> produces hydroxyl radicals and superoxide ions that will neutralise these pollutants in indoor air. Not only does Nano-TiO<sub>2</sub> clean indoor air, studies by universities in Netherlands revealed that 25 to 45 percent of Nitrogen Oxides on the road can be removed by a roadway made with concrete that is blended with TiO<sub>2</sub>.



## Air Ionisation

Air ion generators, or ionisers, disperse negatively charged ions (anions) into the air, similar to the electronic air cleaners but without a collector plate. These ions attach to airborne particles, making them heavier and causing them to settle on the ground faster, away from the nasal breathing zone. Negatively charged oxygen molecules will behave like hydroxyl radicals to neutralise odours and destroy the DNA of pathogens and allergens. Studies have shown that anions can freshen indoor air, reduce tiredness, relieve stress, alleviate affective depression, reinforce collagen, and strengthen the functions of autonomic nerves and the immune system.



# Soma Medical's Total Solution to Indoor Air Quality Assurance (IAQA)

Soma Medical's Total IAQA Solution is supported by an innovative range of quality products.

Soma Medical takes a systems approach to indoor air quality assurance, and provides a cost-effective solution that is professionally configured to every space and customised to every need.

Soma does not just sell products; Soma sells [The Science of Quality Air](#) for [The Art of Healthy Living](#).

## Infection Control Unit

Soma's Infection Control Unit (ICU) combines Soma's technologies into one powerful product and is specifically designed for spaces which require high sanitisation. Soma's ICUs have effectively contained infections in operating theatres and communicable disease wards according to WHO standards. It also benefits high human traffic places like shopping malls, auditoriums and big office spaces which require frequent air purification to remove air-borne viruses and microbial infections which might otherwise spread from one person to another.



## Cleanature Air Purification Systems

Soma's Cleanature range of air purification systems contain Soma's technologies in one portable, installation-free machine. They are developed for Indoor air purification in spaces like offices, homes and consultation rooms of healthcare facilities.



## UVmax Lamps

UVmax uses UV-C rays to cost-effectively kill germs and control the spread of biological pollutants by disinfecting the airstream and surfaces of room spaces and HVAC ducting systems.



## Nano Titanium Dioxide (TiO<sub>2</sub>) Coating

Nano Titanium Dioxide can be easily applied as an additional layer of germicidal protection to a variety of surfaces such as walls, floors, furniture, and upholstery, neutralising dangerous biological pollutants and odours present in any indoor space.

## Medilite Fluorescent Lights

Medilite fluorescent lights combine anion and nano Titanium Dioxide technologies to freshen the air, kill germs and convert gaseous pollutants to harmless by-products. Medilite fluorescent lights are energy-saving and can be used in place of regular light bulbs in homes, offices and buildings.



## Soma For Every Space

Your premises may be:

- A house or housing facility
- A small office environment with low regular staff density and/or low visitor traffic
- A large office environment with high regular staff density and/or medium visitor traffic
- A small retail environment with high human traffic/density
- A large commercial hall or public space with high human traffic/density, like lobbies, front offices, cinemas, museums, and gaming facilities.
- A health and fitness centre or spa
- A large school facility or small classroom environment with medium human traffic/high human density
- A “green” commercial or industrial building with centralised HVAC system or individual indoor air-conditioning units.
- A healthcare facility with stringent hygiene requirements and/or high human traffic/density, like clinics, surgeries, hospital wards, intensive care units, operating theatres, and hospices
- A public transport facility or mass transit system with ultra high human traffic/density, like airports, underground train stations, commuter trains, and air-conditioned buses
- A private or public toilet/washroom
- A swimming pool

**There is a Soma for every space.**

## About Soma Medical

Soma Medical began designing and developing a total solution for indoor air quality assurance and airborne infection control for healthcare facilities in developing countries in 1995 under the advisement of medical and vector control specialists. Today, Soma Medical has implemented its unique and proprietary indoor air quality assurance and airborne infection control protocol in many healthcare facilities that include operating theatres, intensive care units, clinics, dental surgeries and laboratories. Soma Medical has also implemented cost-effective solutions for residential properties, commercial spaces, event halls, industrial premises and agricultural buildings. Soma Medical's products have been approved by many government agencies in various parts of the world, a testament to the innovativeness, effectiveness and quality of Soma Medical's products and services.

**Soma Medical. The Science of Quality Air, The Art of Healthy Living.**

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[www.somamedical.fr](http://www.somamedical.fr)

[www.somamedical.com.my](http://www.somamedical.com.my)

[www.somamedical.asia](http://www.somamedical.asia)

[www.somamedicalnews.com](http://www.somamedicalnews.com)



#### Product Websites:

[www.cleanature.com.my](http://www.cleanature.com.my)

[www.medilites.com](http://www.medilites.com)

[www.uvmax.net](http://www.uvmax.net)

#### News Portals:

[www.indoorairsterilization.com](http://www.indoorairsterilization.com)

[www.uvgi.asia](http://www.uvgi.asia)