



INGENIOUS AIR

# HIGH EFFICIENCY PURIFICATION SYSTEM

DISCOVER HOW TO  
PROVIDE THE  
**ULTIMATE**  
INDOOR CLIMATE



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*Our*

## **STORY**

Since 2010 we've made it our mission to not only improve the air conditioning industry but to change it for the better. This inspired our motto 'Change Is in the Air'. With over 35 years of industry experience, we are incredibly passionate about creating the ultimate indoor climate. In fact, you could say we live and breathe it.

It all started with our original goal: to eliminate thermal problems including being too cold, too hot or even 'over air-conditioned'. However, as time went on, we started to notice there was a more significant problem that wasn't being addressed; indoor air pollution.

With concerns only growing, we decided it was up to us to take action. Alongside our original goal, we set out to make poor indoor air quality a thing of the past. Our drive is to actively improve indoor climate quality, enhancing comfort and maximising welfare.

Throughout our journey, our ethos 'Enhance Well-being, Enable Performance, Enrich Lives' has remained at the root of everything we do.

Fast forward to today, our vision is to provide everyone with the opportunity to live and work in a healthy environment. This is achieved by the award-winning Ingenious Air® System with HEPS; The all-in-one solution with a multitude of features and benefits.



## About

# THE HEPS MODULE

The High Efficiency Purification System (HEPS) can enhance the overall performance of residential properties. It banishes unpleasant smells such as vehicle exhaust fumes, pesticides and cigarette smoke.

Equally, for commercial buildings, it can help eradicate Sick Building Syndrome. This is a situation where occupants experience ill-health due to spending time in an unhealthy building.

The HEPS reduces the spread of all three serious indoor air pollutants:

- 1 Diseases
- 2 Allergies
- 3 Toxins

“

*The HEPS module significantly improve air quality and meets the standards in Indoor Climate Quality (ICQ)*

”



**SUITABLE FOR ANY INDOOR ENVIRONMENT**



**REMOVES A MINIMUM OF 90% AIR PARTICLES**



**PROTECTS FROM DISEASES, ALLERGIES & TOXINS**



## Indoor

# AIR POLLUTANTS

The HEPS reduces the spread of all three serious indoor air pollutants:

### DISEASES

Removes bacteria (1 to 0.3 microns in size) and viruses (0.001 microns in size), which cause infectious illnesses, including:

- Influenza.
- Common cold.
- Tuberculosis.
- Chickenpox.
- C.difficile.

### ALLERGIES

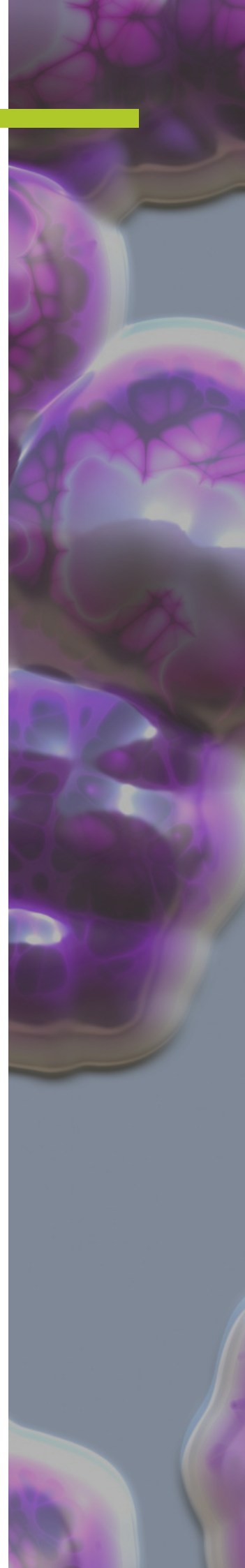
Removes allergens (0.3 – 10 microns in size), which trigger allergies, hayfever, asthma, emphysema and chronic bronchitis. This improves allergy symptoms by removing:

- Pollen.
- Fungal spores.
- Dust mites.
- Pet dander.
- Tobacco smoke.

### TOXINS

Removes VOCs (0.3 microns and smaller), which can cause short and long-term ill-health, by removing:

- Nitrous oxide(s).
- Carbon monoxide.
- Fumes.
- Unpleasant odours.



*Improving*

# INDOOR CLIMATE QUALITY

In alignment with Indoor Climate Quality's (ICQ) guidelines, The Ingenious Air Company's motivation is to create the ultimate indoor climate.

We actively improve indoor air quality and ensure a comfortable and productive environment.

We strongly believe that everyone should live and work in a healthy environment.

We provide a safe haven through purification, dramatically reducing disease-causing viruses and bacteria, allergens and dust.

The advanced technology means air is completely purified, especially in those hard to reach areas.



INDOOR CLIMATE QUALITY

- ✓ Cooling
- ✓ Heating
- ✓ Clean Ducting
- ✓ Air Purification
- ✓ Surface Purification

Any

# ENVIRONMENT

## W O R K

Indoor Climate Quality (ICQ) is one of the main environmental factors that impact employee health and well-being.

Monitoring and improving the ICQ in your workplace is therefore extremely important.

It considerably improves employees' health and:

- Reduce absentee rates.
- Improve cognitive function and decision making.
- Increase overall productivity.
- Create an indoor safe haven in heavily polluted cities.

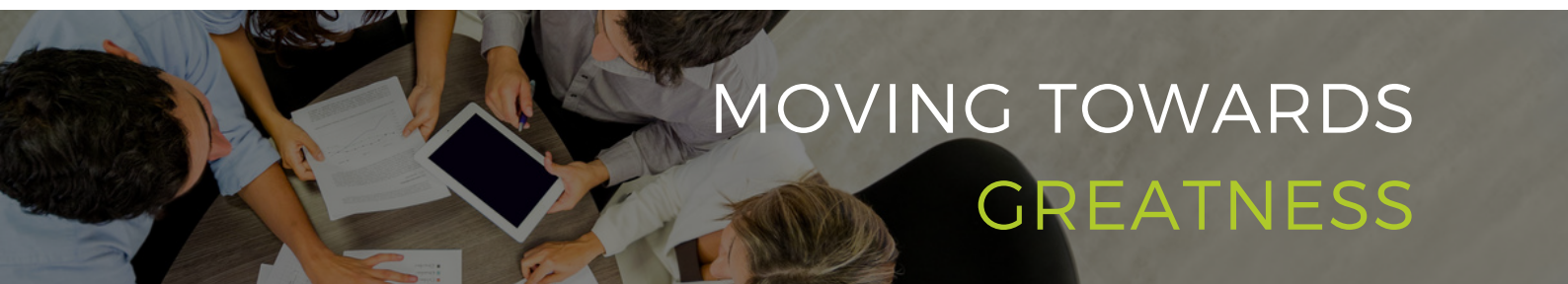
## H O M E

Those most susceptible to the risks of poor ICQ are young children, the elderly and the sick.

Early exposure to high levels of air pollution can cause long-term respiratory illnesses such as asthma.

Improving the air quality in your home can:

- Improve health and well being.
- Reduce allergies.
- Enable a better night's sleep.
- Protect vulnerable people.



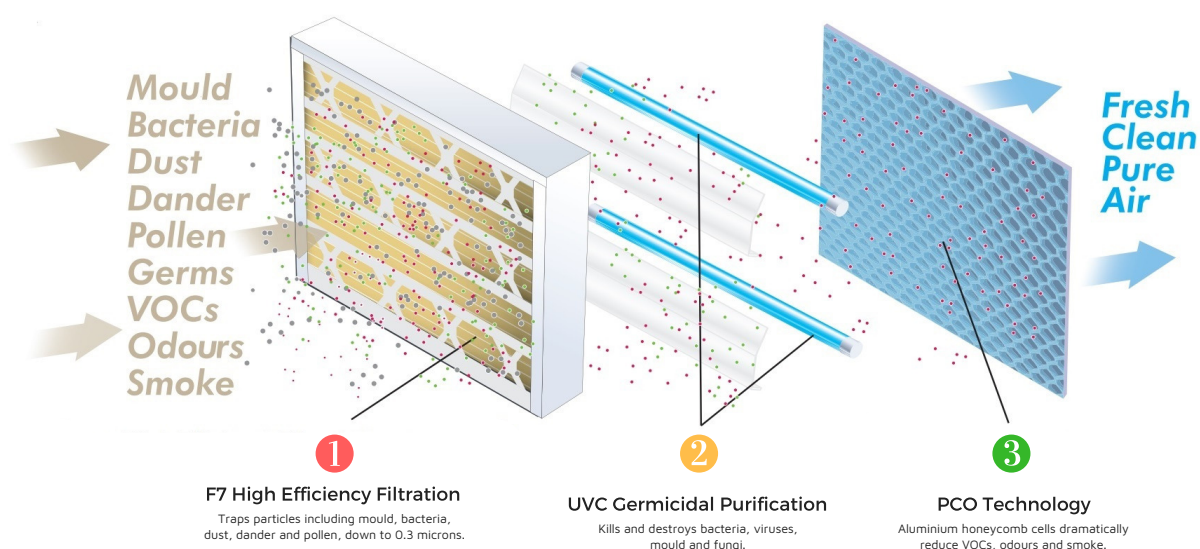
MOVING TOWARDS  
GREATNESS

Discover

# HOW IT WORKS

The HEPS reduces costs by combining three powerful technologies in one system:

1. High Efficiency Filtration.
2. UVC Germicidal Purification.
3. PCO Technology.



## HIGH EFFICIENCY FILTRATION

The HEPS uses the “needled fibre electrostatic filtration media” developed by 3M Corporation. This Grade F7 to EN779 (MERV-13) filter gives high efficiency particle reduction while maintaining high dirt loadings and low static back pressure.

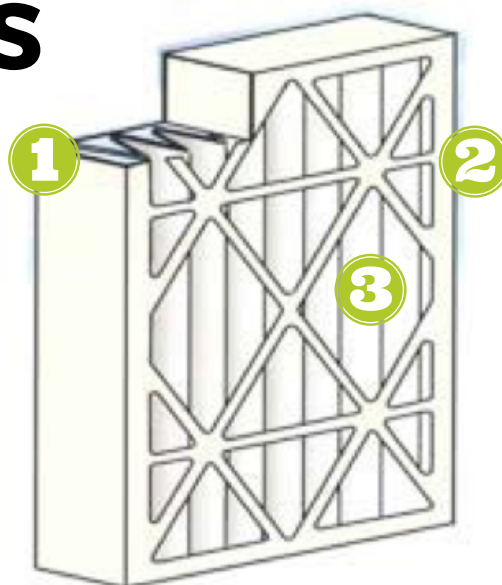
The filter removes up to 96.3% of microscopic disease-causing particles and airborne allergens down to 0.3 microns in size. (A human hair is 80 microns and bacteria 1 micron in size).

ASHRAE rates the HEPS filter to ASHRAE Standard 52.2.

## Discover

# HOW IT WORKS

- 1** Galvanised steel pleat support grid
- 2** Filter media frame
- 3** Electrostatically charged needled media



## ULTRAVIOLET C GERMICIDAL PURIFICATION

Germicidal ultraviolet light (UVC) destroys airborne bacteria, viruses and VOCs too small to be caught by HEPA filters. It kills disease germs on contact including tuberculosis, legionella, pneumonia, colds, influenza and C.difficile.

## PCO TECHNOLOGY

HEPS uses powerful photo-catalytic oxidation (PCO) technology. This acts as an 'air sanitizer' to reduce VOCs, chemical fumes and odours by up to 90% or more. PCO is a reaction that occurs when TiO<sub>2</sub> is exposed to UVC light rays.

The unique honeycomb aluminium cells of the PCO technology increases surface area and catalytic output exponentially while magnifying the effectiveness of the UVC light. The PCO technology is also maintenance-free and never needs replacing.



*Extremely*

# ENERGY EFFICIENT

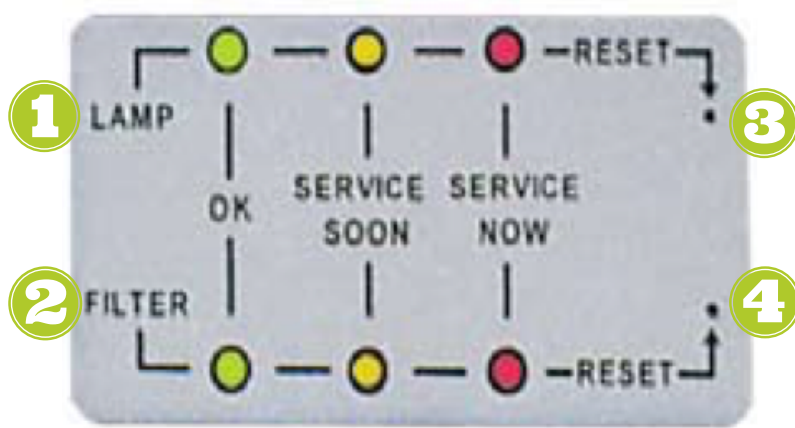
The HEPS forms part of The Ingenious Air® System – the only small duct system to pass Energy Star testing.

It increases the energy efficiency of The Ingenious Air® System by eliminating the build-up of mould and dirt on evaporator cooling coils and heat exchanger surfaces.

The HEPS may also reduce the requirement to bring in outside air. This can lead to less energy being used to treat incoming air.

The module is more energy efficient than other high specification air purification systems, such as HEPA filters. HEPA filters can significantly reduce airflow, which can triple electrical consumption.

The HEPS always operates at maximum efficiency: Built-in electronic service lights indicate when to change filters and ultraviolet lamps thirty days in advance.



- ① U.V. Lamp Service
- ② Filter Service
- ③ U.V. Lamp Reset
- ④ Filter Reset





*Effortless*

# DUCT CLEANING

The unique air movement pattern prevents dirt building up inside the ducts. This reduces the maintenance requirements of the system as ducts do not need to be cleaned like with standard systems.

The photo below shows the condition of the inside of a duct, 6 years after installation. The unit has been in continuous use in an office and there is no dirt build up. The identification stamp inside is still visible and no dust has settled.



*We were constantly having maintenance carried out as our system seemed to always get dirty and not work to its maximum potential. Since installing this system, we have dramatically reduced the need, which ultimately is saving us time as well as money.*

**SARAH PULLEN,**  
A-Z MARKETING CO

Low

# MAINTENANCE

Due to the self-cleaning action of the PCO technology, only the filter and UV lamps require replacing, meaning there is virtually no maintenance needed.

The recommended servicing period depends on the application and the installation location. In highly polluted areas, servicing may be required more regularly.

Generally, it is recommended that the filter is replaced every six months and the ultraviolet lamps are replaced annually. The titanium oxide mesh does not need to be changed for the life of the system.

In addition to being cost-effective, maintenance is also straightforward and can be carried out by your general maintenance team.

The HEPS is connected to the main air handling unit (AHU) of The Ingenious Air® System. The AHU is usually located in a cupboard or ceiling void away from the conditioned area. Only the temperature controller and air outlets will be in the occupied space.

This means that maintenance can be carried out with minimal disruption to occupants and work.

**1** Filter after four months of use

**2** New filter



## Cleaning

# THE FILTER & LAMPS

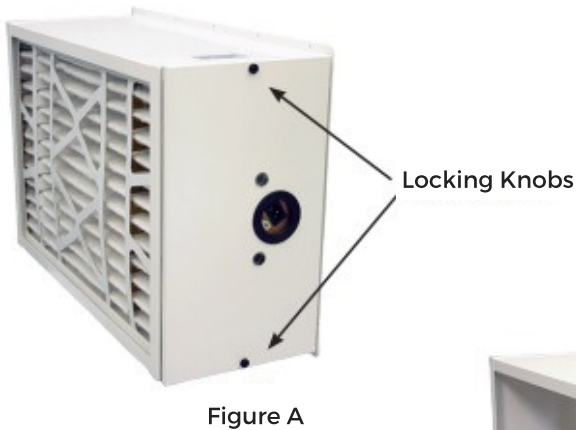


Figure A



Figure C

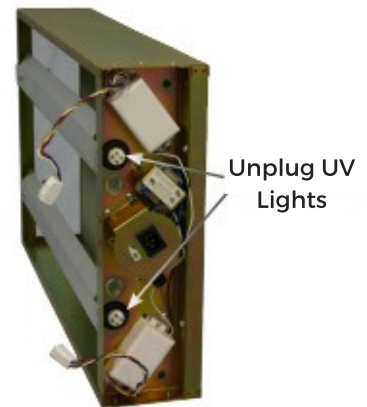


Figure D



Figure B

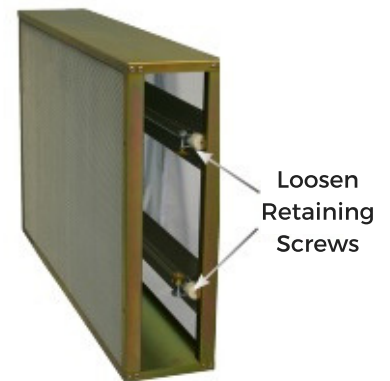


Figure E

Ensure filter and photocatalytic module are installed in proper air flow sequence.

### Changing the Filter

1. Unplug the power cord from the HEPS unit. Unscrew the two locking knobs and remove the door (Figure A).
2. Remove old filter and replace with new filter. Make sure airflow arrow on the filter is pointing to the inside of module (Figure B).

### Changing the UV Lamps

1. Remove filter as in above (Figure A, B).
2. Remove Photocatalytic module (Figure C).
3. Unplug UV lights, loosen retaining screws, and remove UV lights (Figure D, E).
4. Replace UV lights, re-tension retaining screws, and replace plug-ins.
5. Replace Photocatalytic module and filter, secure door and re-insert plug, check sight ports to ensure lamp illumination.

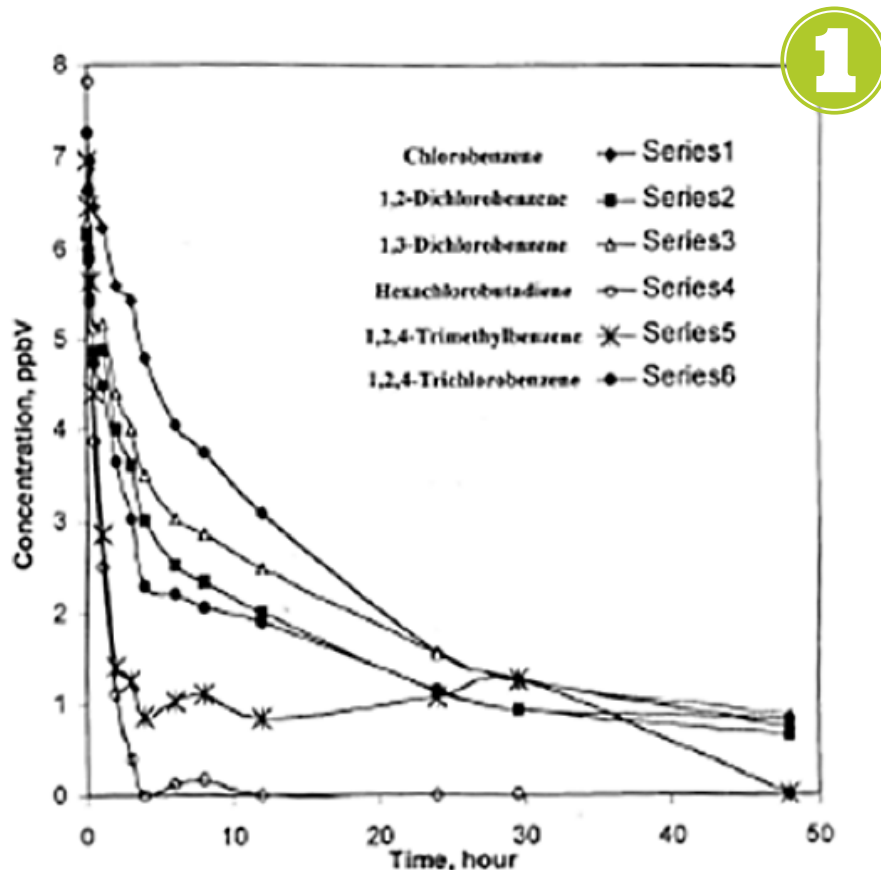
*Dedicated*

# RESEARCH

The Southwest Research Institute (www.swri.com) in San Antonio, Texas, conducted tests on the destruction of typical VOCs by the HEPS Air Purification System. The results are shown in Figure 1.

Alpha Scientist in Reproductive Medicine tested the HEPS and portable HEPS for the reduction of VOCs in IVF laboratories, where even low levels of VOCs in the parts per billion can be extremely detrimental to the development of embryos.

The test data confirmed that the filter lowered the VOC levels by up to 82% down to an average level of (8ppb). The conclusion was that by installing the HEPS Air Purification System, there was no longer a need for a burn-in period of 30-40 days before the laboratory could be used.



Decomposition Process of Some VOCs

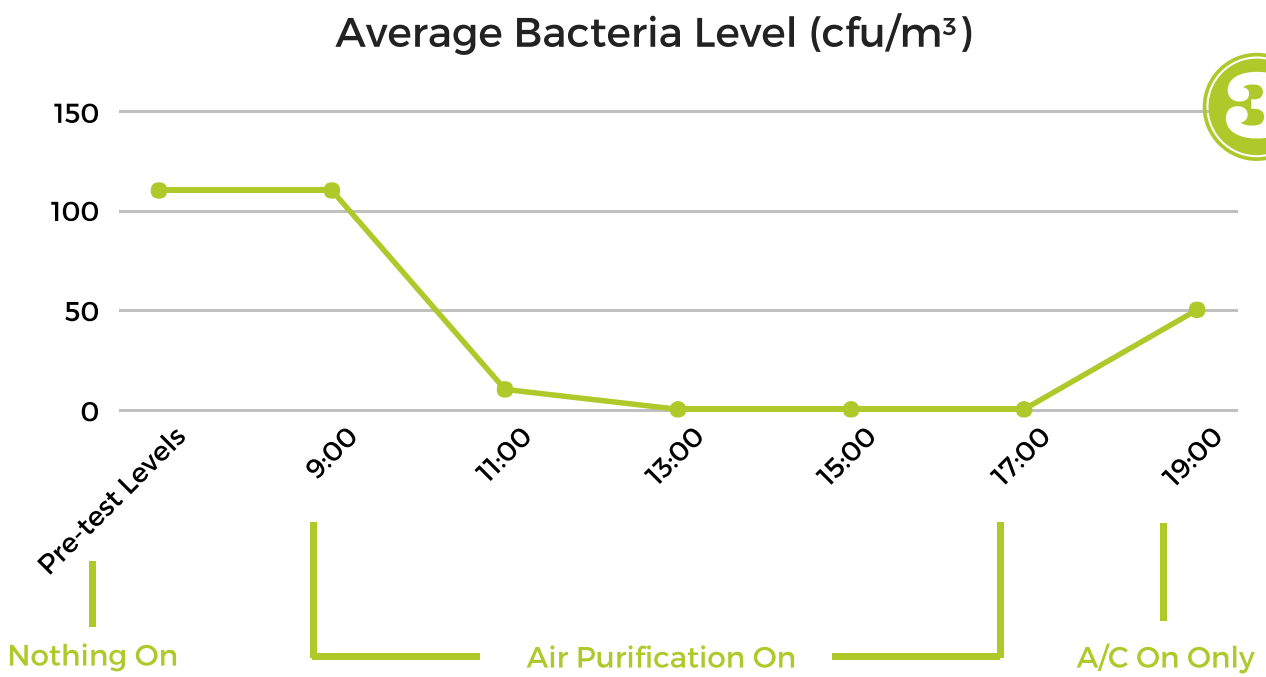
*Dedicated*

# RESEARCH

Further tests were requested by the government of Hong Kong and conducted at The Hong Kong Polytechnic University, Department Of Applied Biology and Chemical Technology. The results were a reduction in bacteria and VOCs of 90% after 2:30 hours of operation. The results are shown in Figure 2 as well as in Figure 3.



Testing Information	Average Bacteria Level (cfu/m <sup>3</sup> )
Background Level	111
9:00 - 11:00	7
11:00 - 13:00	LOD
13:00 - 15:00	LOD
15:00 - 17:00	LOD
AC On (Sun-Pure SP200 Off)	39



Reduction in VOCs during operation



Recent

## CASE STUDY

Air Purification Only  
Option for Luxury London  
Apartment



## THE PROBLEM

The owner of this large three bedroom apartment in London's prestigious Park Lane was concerned about the city's poor air quality. She understood how indoor air quality is affected by both indoor and outdoor air pollution. She also understood the potential negative impact poor indoor air quality has on health. As the apartment already had heating and air conditioning, she needed a system to provide air purification only to clean the air. The system also needed to solve the issue of restricted space for ducting.

## THE SOLUTION

One HE-71 Ingenious Air® Small Duct System with high specification air purification, but no heating or cooling, was installed. Ducting was routed through the floor joists to solve the issue of restricted space. The air handling unit (the core of the system) was positioned upside down to supply purified air vertically downwards into the floor ducting. The floor ducting terminates in slotted air outlets installed in the skirting boards. These deliver purified air to every room. In the bathrooms, purified air is also delivered via air outlets positioned at a high level in the walls.



Recent

## CASE STUDY

### FOLLOW UP

The Ingenious Air® System gently re-circulates and purifies the indoor air. It removes all three types of serious indoor air pollutant, which can lead to short and long-term ill-health:

1. Airborne toxic volatile organic compounds (VOCs) including nitrous oxide, carbon monoxide, fumes and odours from vehicle exhausts.
2. Airborne bacteria and viruses (0.001 microns) that cause infectious illness including influenza, colds, tuberculosis, chickenpox and c.difficile.
3. Airborne allergens including pollen, dust mites, tobacco smoke.

The fan speed control allows for switching between a high-speed setting when the apartment is unoccupied and a low-speed setting during occupation. At the lower fan speed the full volume of air of the apartment is drawn through the purification unit every four hours or so – i.e. there are approximately six full air changes per day. This increases to approximately one air change per hour during unoccupied times when smells normally build up.

The owner enjoys clean and healthy air. Ingenious Air provides routine planned maintenance twice a year to ensure the air purification maintains optimum effectiveness.



ANOTHER SUCCESS  
STORY

*Introducing...*



INGENIOUS SOLAR

The most advanced  
renewable energy  
product available today.

Combines both solar  
panels and a heat pump.

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condition, including the  
sun, wind or rain.

Patented features to  
ensure optimum  
performance in the  
UK climate.

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