



 **SabaTechnology**
WATER FROM MOISTURE 

Summary

- | | | | |
|---|---------------------------|----|------------------------------|
| 1 | The Problem | 6 | Continuous sanitation |
| 2 | Saba Technology | 7 | Application fields |
| 3 | The PCO technology | 8 | Scientific tests |
| 4 | Our products | 9 | References |
| 5 | Product details | 10 | Awards |

RECENT STUDIES LINKED **INDOOR AIR POLLUTION** TO **HEALTH-EFFECTS** SUCH AS HEADACHE, RESPIRATORY PROBLEMS, INFECTIOUS DISEASES, CHRONIC COUGH, EYE IRRITATION

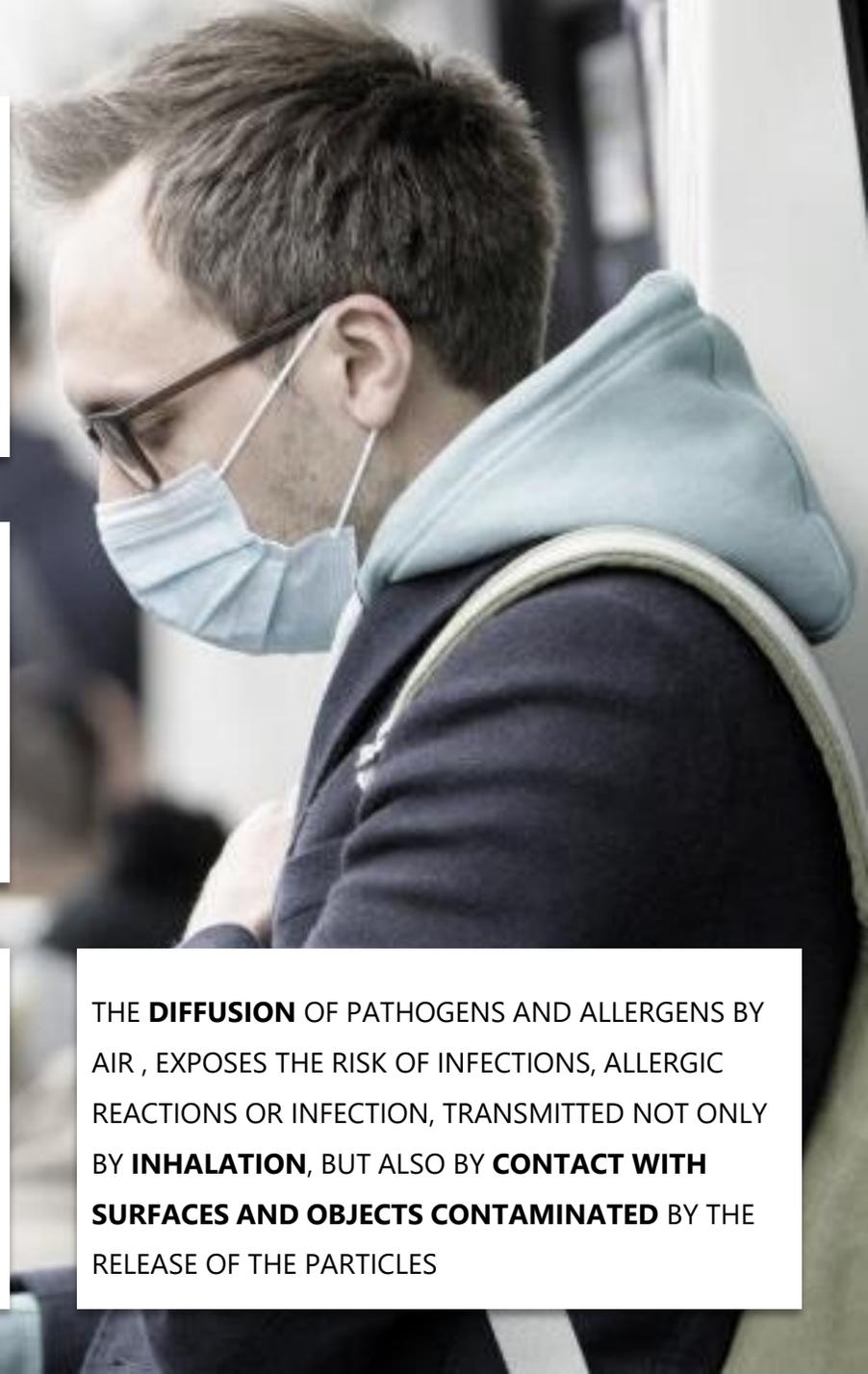
PEOPLE SUFFERING DISORDERS LIKE ASTHMA, ALLERGIES AND PULMONARY DISEASES ARE ALSO EXTREMELY VULNERABLE TO **INDOOR POLLUTION**, MORE THAN ENVIRONMENTAL POLLUTION

THE THREAT REPRESENTED BY THE **CONTAMINATION OF INDOOR AIR** IS A BIGGER PROBLEM THAN EVER AND THE EXPOSURE
- ESPECIALLY IN **HEALTH FACILITIES** - IT IS A BIG CHALLENGE

BIOLOGICAL AGENTS PRESENT IN THE AIR, GENERALLY AGGREGATED IN PARTICLES, ARE DIFFUSED BY **CONVECTIVE MOTIONS** AND **AIR CURRENTS**

THE **DIFFUSION** OF PATHOGENS AND ALLERGENS BY AIR , EXPOSES THE RISK OF INFECTIONS, ALLERGIC REACTIONS OR INFECTION, TRANSMITTED NOT ONLY BY **INHALATION**, BUT ALSO BY **CONTACT WITH SURFACES AND OBJECTS CONTAMINATED** BY THE RELEASE OF THE PARTICLES

The Problem



Saba Technology

Who

Saba Technology is an **innovative startup** that applies research and passion in the development of new technologies for the collection, treatment and supply of **water**, as well as related technologies for **air sanitation**.

Our activity and our products are designed and produced exclusively in **Sicily**, a fertile territory of incentives for research in the environmental and energy.

The **team** is made up of young researchers and developers highly specialized in the engineering, chemical, biological, physical, economic and design fields.

What

Saba has its **core business** in the Easy Drop system design, responsible for recovering potable water from air humidity, even in a desert environment, and all the optimization of energy consumption. The network developed over the years by Saba's partners, allowed the company to extend its expertise to technologies dedicated to **indoor air sanitation**.

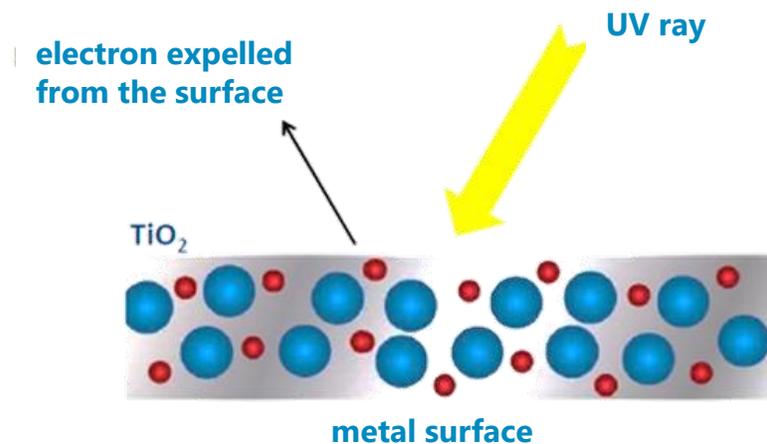
How

The inspiring principle of Saba Technology comes from the drama of **water problem**, from the need to stem the spread of microbial agents dangerous to health and from the desire to **create long term value** through technological innovation, sustainable development and the quality of processes. More than 60% of the company's economic and human resources are employed in research and development (R&D). **Strategic partnerships** with companies and universities give the product an added value in technology and innovation.

The PCO technology

What is it

The **PCO** (PhotoCatalytic Oxidation) technology, was produced in the mid-90s by NASA for the **sanitization of environments** intended for aerospace missions.



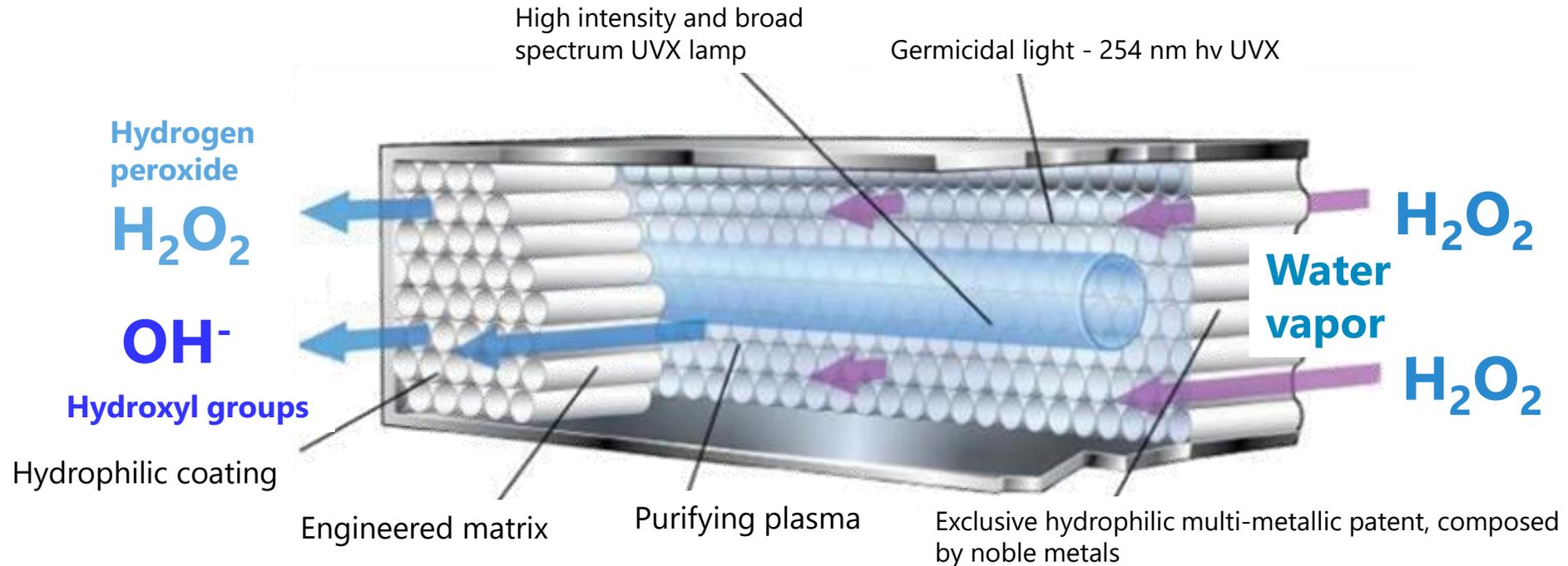
The technology imitates and reproduces what occurs in nature through **photocatalysis**: this process, thanks to the combined action of **UV rays** from the sun, **moisture** present in the air and some **noble metals** present in nature, generates **oxidizing ions** capable of destroy most pollutants and toxic substances.

The **photochemical reaction** that is generated therefore allows to **destroy** polluting substances, in particular **bacteria, viruses, molds, allergens** and **odors**, with a natural active principle.

The PCO technology

Operating principles

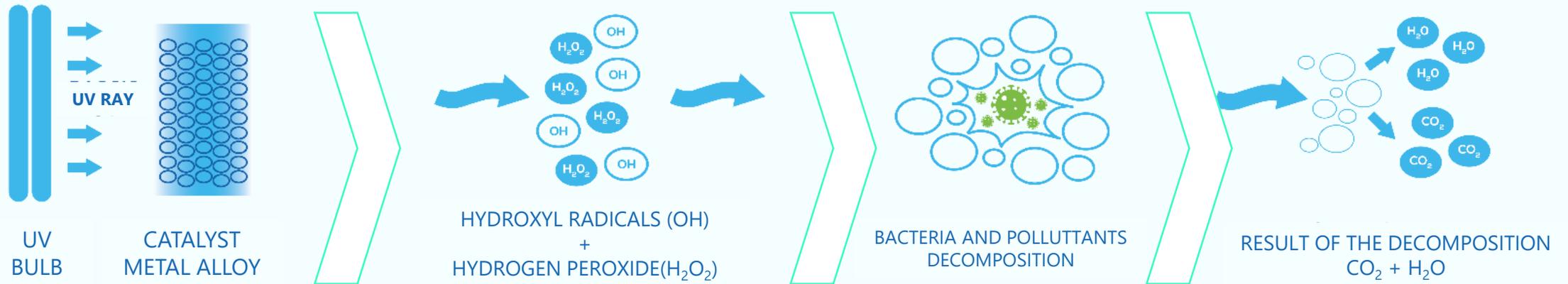
The **PCO** technology of the products, uses the combined action of a special **UV bulb** rays and a catalyst structure consisting of a **metal alloy with a honeycomb matrix**, mainly composed of **TiO₂** (titanium dioxide) and other noble metals.



The PCO technology

Operating process

The picture below exemplifies the **operation process of photocatalytic oxidation (PCO) technology**.



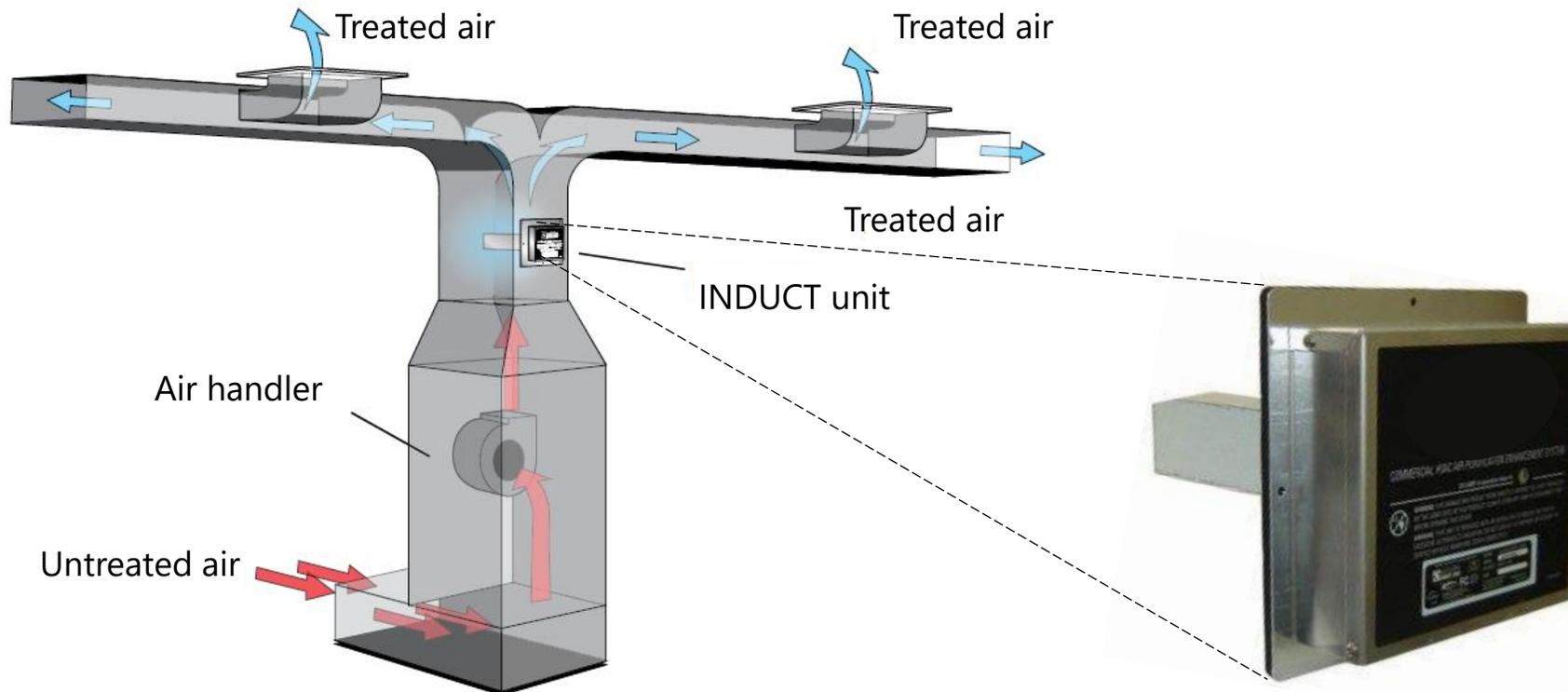
- 1) The **air flow laden with humidity**, carried by the ventilation system, **passes through the module composed of the metal alloy**
- 2) A **photochemical oxidation reaction** starts thanks to the action of a high intensity UV lamp, producing **hydroxyl radicals (OH)** and **hydrogen peroxide (H₂O₂)**
- 3) Bacteria and pollutants decomposition through **oxidation reactions** and virus inactivation **increasing the oxygen level**
- 4) Spreading into the surrounding environment and depositing on the surfaces, hydrogen peroxide **allows the safe, effective and complete sanitization** of the surfaces of the ducts, of the air and, by fall, also of the surfaces of the treated rooms and any fabrics.

The PCO technology

Why «active sanitation»?

The proposed **active sanitation system** differs from passive sanitization systems (traditional filtration, classic ionization, germicidal lamps) in that, thanks to the **oxidizing agents generated by PCO technology**, there is a **sanitizing effect** not only at the point where the device is installed but also on the **surfaces of the environment affected by the air flow** and in the entire **aeraulic circuit**.

It's possible to install our products **both in the A.H.U. that in the ducts of the all-air system** downstream of the fan, so that the air flow invests and passes correctly through the unit.



Our products

INDUCT, AP 500 and AS 200 are solutions designed for the **indoor environments remediation** from microbial agents, viruses, molds, allergens and odors; these are devices **that use PCO technology** for the **continuous sanitization of air, environments and surfaces**.



INDUCT

Installable both in the **A.H.U.** that in the **air distribution ducts**, downstream of the air handler. It is available in **different sizes**, depending on the air flow rate used and the air conditioning project, and uses the **Ozone** treatment integrated in the PCO module



AP 500

Portable device, with **integrated ventilation system**. Allows to sanitize up to about 46 m



AS 200

220V **table device**. It is equipped with an efficient **HEPA filter**, an adjustable **fan** and optional **Ozone** treatment.

Products detail (1/2)

INDUCT

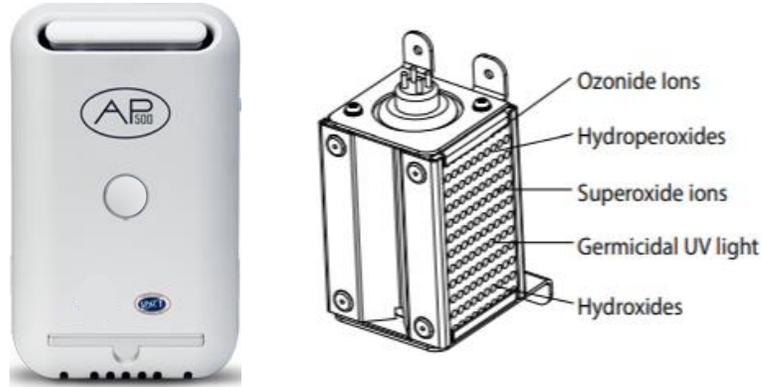


Induct is a device that can be **installed** directly inside the **all-air ventilation system** that guarantees continuous and active sanitization of the indoor environment. Depending on the characteristics of the system (flow rate, duct dimensions, rooms, etc. ...), **the number and size of the devices** to be installed will be estimated.

In fact, **Induct** is available in the cuts expressed in sq ft (square feet) of the surface of the environment to be treated: **500 - 750 - 2000 - 5000 - 10000**. The **Ozone generator** is integrated in the PCO cell. The air conditioning project is required for the estimate.

Product details (2/2)

AP 500



AS 200



Portable device with **integrated ventilation system**. **AP 500** allows the sanitation of spaces up to 500 sq ft (square feet), or approximately 46 sq m. It is a one-size product.

Main product features:

- 220 V power supply or 12/24 V network with inverter (not included).
Estimated consumption: 13 W
- ON / OFF switch
- Dimensions: 15,5 x 30 x 10 cm
- Weight: 1.3 kg

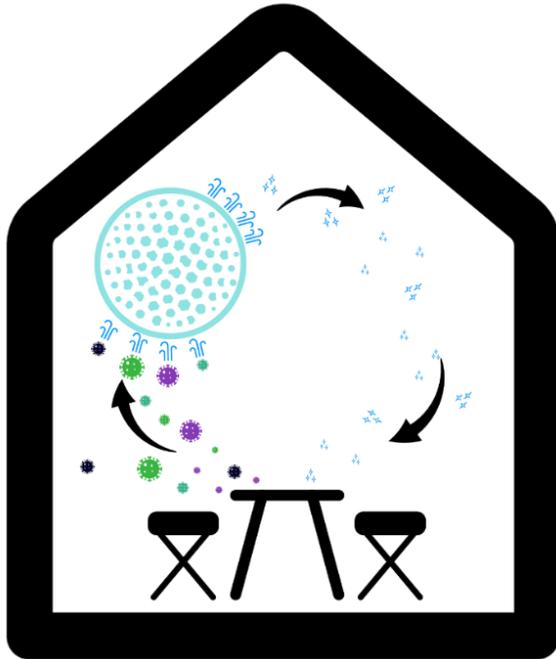
Equipped with an integrated ventilation system, **AS 200** allows you to sanitize up to 3000 sq ft (square feet), or approximately 279 sq m.

It is a one-size product.

Main features:

- 220 V power supply. Estimated consumption: 70 W
- Adjustable ventilation fan and remote control
- AWAY mode for «super sanitization» with Ozone
- Dimensions: 30.5 x 23 x 30.5 cm
- Weight: 4.6 kg

Continuous sanitation



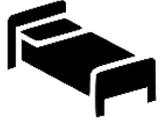
The common quality feature of our products is the **continuous sanitization** of the indoor environment.

The INDUCT products, applied to the existing ventilation systems in buildings and on the means of transport, allow **uninterrupted protection** in relation to the operation of the ventilation / sanitizing system, **reducing the exposure between one manual disinfection and the other**, as well as the **intervention costs** .

This technology also allows to act on the surfaces, on the fabrics of the occupants and on the furnishings (curtains, chairs, sofas, ...).

The AWAY mode, that can be activated installed in the AS 200 product, allows for **greater sanitization** by using **Ozone**. **The duration of the treatment** can be set using the remote control which allows you to set the duration in 2/4/6/8 hours.

Application fields



ACCOMODATION FACILITIES



RESTAURANTS AND SUPERMARKETS



**SHELTER FACILITIES,
TREATMENT CENTERS,
PHARMACIES**



HOUSES



SCHOOLS AND UNIVERSITIES



OFFICES



PUBLICAL TRANSPORTATION



RESCUE VEHICLES



SMALL ROOMS

Scientific tests on microbial agents

Scientific tests, conducted by universities and laboratories in the U.S., demonstrate the effectiveness of **PCO technology** in reducing the bacterial load present in the environment within 24 hours.

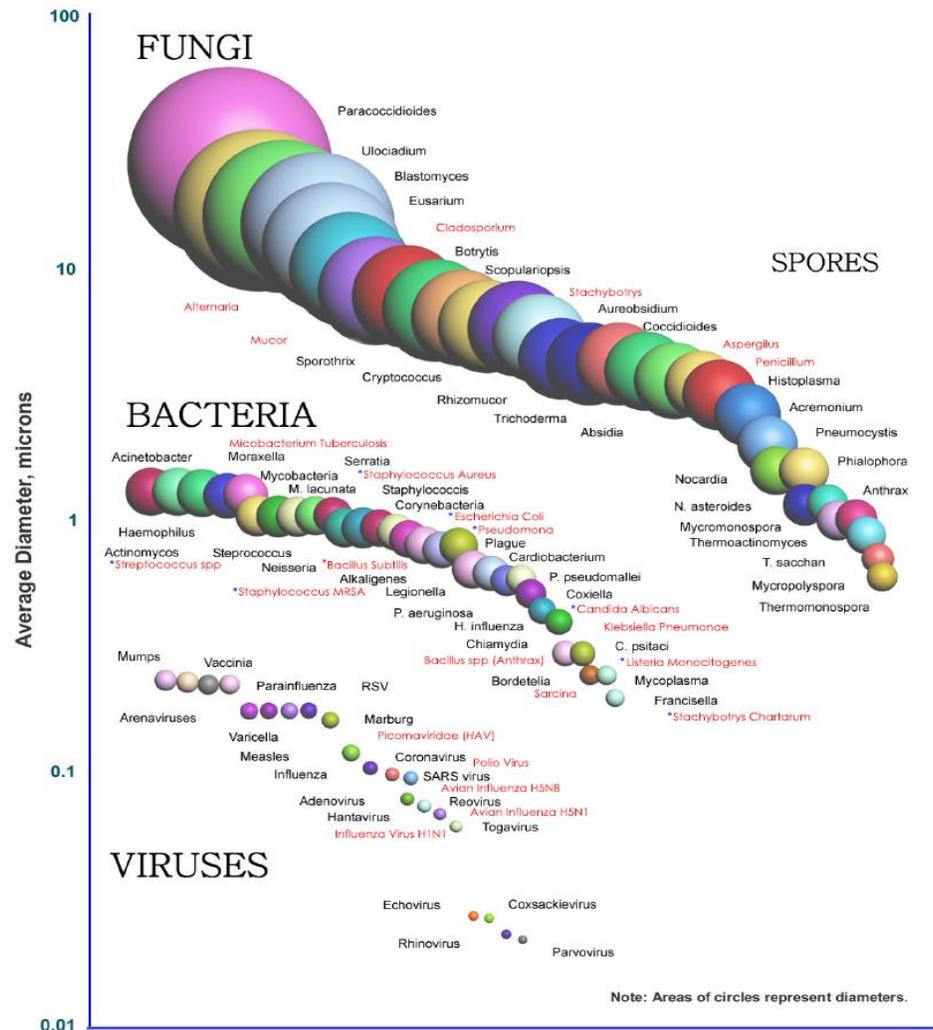
Among many, the **studies were conducted on the following categories:**

Bacteria: Stafilococco Aureo, Escherichia Coli, Bacillus cereus, Stafilococco Aureo R, Streptococco, Pseudomonas, Lysteria Monocytogenes, Candida Albicans, Stachybotrys Chartarum

... and also on Moraxella, Streptococcus spp, Klebsiella pneumoniae

- Virus:** Murine norovirus, Enterovirus, Influenza A Virus, Legionella, Coronavirus, MS2, H1N1, Epatite A, Influenza aviaria

- Fungi:** Aspergillus, Penicillium, Mucor

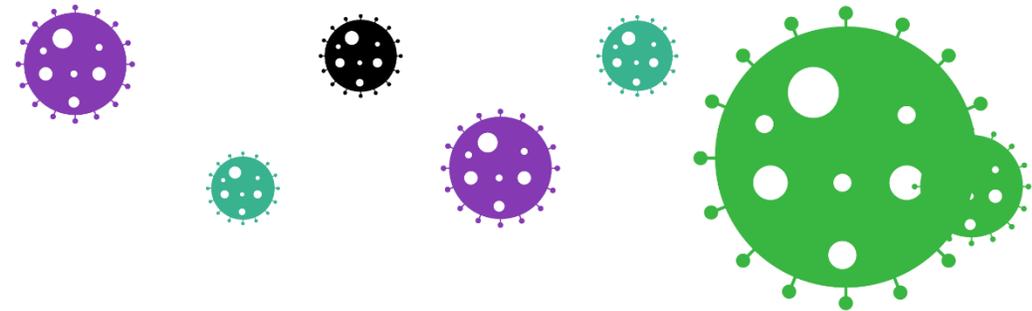
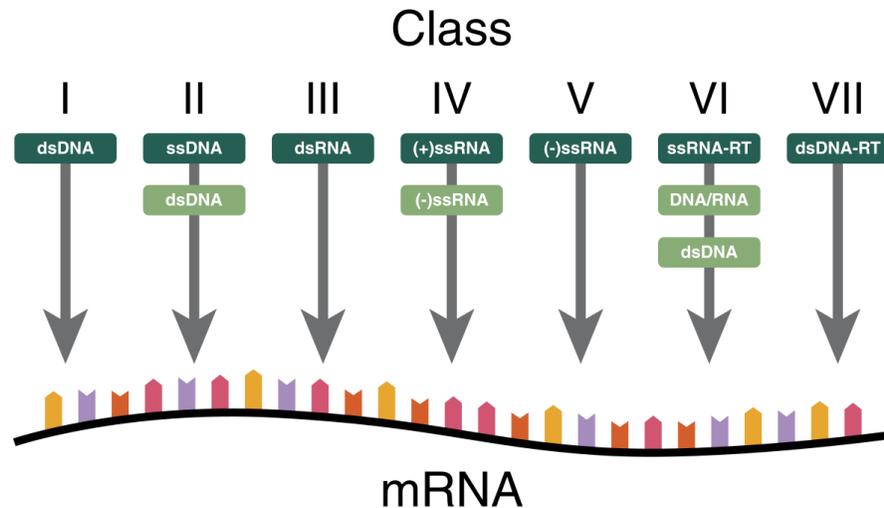


* Center for Health-Related Aerosol Studies, Department of Environmental Health, University of Cincinnati, 3223 Eden Avenue, PO Box 670036, Cincinnati, Ohio 45267-0036

* M. T. Ortega, L. J. Franken, P. R. Hargrett, and J. L. Marsden
Department of Animal Sciences & Industry
K-State Food Science Institute
Kansas State University, Manhattan, KS 66506

Scientific tests on RNA viruses

Tests carried out by the **FDA** (Food and Drug Administration - USA) on 1/31/2020 on the **RNA MS2 virus**, confirm that **PCO technology reduces** air contamination caused by the virus **by 99.999%** in less than **15 minutes**, which represents a reduction logarithmic based 5.



SARS-CoV-2 (also known as Wuhan's coronavirus) is part of the **Betacoronavirus** genus, which in turn is classified by the Group IV taxonomy committee for viruses - single-stranded positive RNA virus, to which the tested **MS2** virus belongs.

The **FDA** claims that if MS2 is killed, **potentially all RNA viruses are killed**.

References (1/3)

Here are some of the **major European hospitals** that use PCO technology.

- Ruber International Clinic , Madrid , Spagna
- FREMAP Hospital , Madrid , Spagna
- FREMAP Hospital , Siviglia, Spagna
- Ospedale pubblico a Pontevedra, Sergas, Spagna
- Clinique des Murins , Orleans , Francia
- Clinique de l' Archette , Olivet , Francia
- Clinique des Buissonnets , Olivet , Francia
- Ospedale La Timone , Marsiglia, Francia
- Ospedale Clevedon , Somerset , Regno Unito
- Cheshire NHS Treatment Centre , Liverpool , Regno Unito



References (2/3)

Here are some of the **major American hospitals** that use PCO technology.

- Jacobi Medical Center , New York , USA
- Crossroads Community Hospital , Illinois , USA
- Laughlin Memorial Hospital , Tennessee , USA
- Hospital pediátrico CNY , New York , USA
- Mayo Clinic , Florida , USA

- Siriano libanese Hospital , Sao Paulo, Brasile
- Ospedale Sao Luiz , Sao Paulo, Brasile
- Albert Einstein Hospital , Sao Paulo, Brasile
- Charity Hospital Portugheze , Sao Paulo , Brasile
- Reale Ospedale Português , Recife, Brasile
- Unimed Sao Roque , Sao Paulo, Brasile

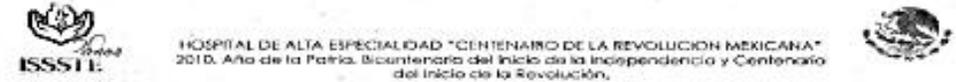


References (3/3)



Delegación Estatal Morelos
Subdelegación Médica ISSSTE
Subdirección Médica
Servicio de Laboratorio de Análisis Clínicos

Fecha de la toma	Sala	Origen del Alasamiento	Organismo Identificado	Recuento Cuantitativo UFC*
10/febrero/2011	Quirófano 2	Mesa cirugía	Staphylococcus aureus	Más de 100,000 UFC
		Mesa de riñón	Staphylococcus aureus	Más de 100,000 UFC
		Mampara	Negativo a desarrollo bacteriano	



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Fecha de la toma	Sala	Origen del Alasamiento	Organismo Identificado	Recuento Cuantitativo UFC*
15/febrero/2011	Quirófano 2	Mesa cirugía	Negativo a desarrollo bacteriano	
		Mesa de riñón	Negativo a desarrollo bacteriano	
		Lámpara	Negativo a desarrollo bacteriano	

ISSSTE Hospital - Mexico City



On February 10, 2011, in-depth tests were conducted in operating rooms with over 100,000 CFU (Colony forming unit)

After 5 days of exposure to the air treated by INDUCT units, there was a **total absence of bacterial load**.

Awards



The PCO technology has been inducted into **Space Technology Hall of Fame®** in the **2017**.

The **Space Technology Hall of Fame®** increase awareness of the benefits of space exploration and encourages further innovation by recognizing individuals, organizations and companies that effectively adapt and **market technologies** originally developed for space to improve the quality of life for all humanity.

Created in 1988, the Space Technology Hall of Fame® **recognizes the life-changing technologies emerging from global space programs**; honors the scientists, engineers and innovators responsible; and communicates to the public the importance of these technologies as a return on investment in space exploration.





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