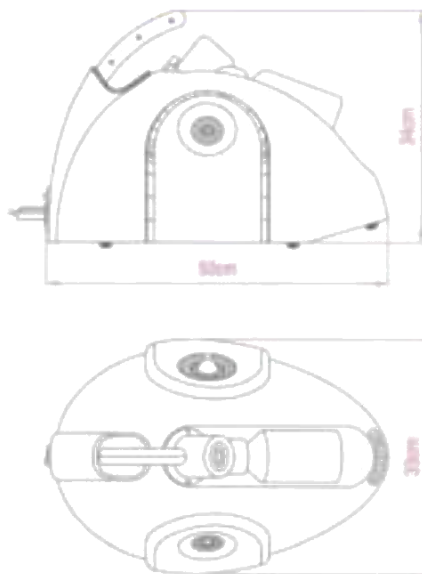


THE APPROPRIATE EQUIPMENT



NOCOSPRAY®

- Only 5.8 Kg
- 1100 watt electric turbine, rotation speed of 22000 RPM
- Mist projection of Venturi effect up to 15 meters from the appliance
- Speed of mist exit : 80 m/s
- Manufactured in accordance with ISO 9001
- Automatic stop, delayed start
- Fire-extinction hood
- No need to drain when changing the cartridge



• ECOLOGICAL :

99.9% biodegradable & non corrosive.

No danger for the users, for the environment or for the treated areas.

• FAST ACTING

3 minutes treatment for a 50 m³ volume & the area can be reused **ONLY 30 minutes** later.

• EASY TO USE

Programming according to the volume to be treated (from 20 to 500 m³)*.

• COST-EFFECTIVE :

Only 1 ml for 1 m³.

• PRACTICAL AND FLEXIBLE

Only 5.8 kg and can be used as a spray gun.

***Also available NOCOMAX for areas from 500 m³ to 20,000 m³**

THE ACCESSORIES

Flexible Hose

2 uses:

1 - Enabling the use of the diffusion nozzle as a "painting spray gun" to focus on particular points:

air conditioning filters, hot and cold air treatment appliances, electric circuits, etc.

2 - Enabling the use of the nozzle through a separating wall.



Kit for Remote Access

Enabling the Nocospray vaporization nozzle to be set up in a room to be treated without entering it.

Pressurized air is brought in through the hose connected to the Nocospray outside the room. It is only necessary to regularly replace the NocoHyse cartridge. Perfect for white rooms or vehicles (laundry transport, ambulances, etc.)



PRINCIPLE AND TECHNIQUE

The concept is based on the use of the combination pairing "appliance-product" : Nocospray - Nocolyse

According to CULBERTSON*, infectious risk is based on three parameters :

- The existence of a pathogenic germ (invisible)
- Immune defenses of the individual (variable from person to person)
- The infecting dose (variable from one germ to another, depending on its toxicity, but in any case necessary to defeat immune defenses.)

OXY'PHARM's aim is to reduce the dose of the pathogen to a minimum so that anyone can visit any premises presenting a potential danger with : **MINIMUM INFECTIOUS RISK**

*CULBERTSON : Swedish microbiologist

SURFACE DISINFECTION VIA AEROSOL (S.D.V.A.) NOCOLYSE PROPULSION

Non-toxic and made up of H_2O_2 , H_2O and $AgNO_3$, plus a surfactant, the disinfecting liquid (Nocolyse) is nebulized to form an aerosol which is then propelled by the Nocospray turbine at 80m/sec and at 37°C.

The size of the particles formed (less than $5\mu m$) in the non-wetting fog ensures a slow and perfectly uniform sedimentation on each cm^2 of the treated premises without humidity or corrosion.

There is no formation of volatile organic compounds due to the rapid decomposition of more than 99% of the fog which leaves nothing behind once it has acted.

AMPLIFYING THE ACTION OF NOCOLYSE

The combination of speed and temperature enables the ionization of the emitted particles and the degradation of the peroxide to create extremely oxidizing free radicals (superoxide ions) with a very short lifetime.

As micro - organisms are very hydrophilic, a nucleation process takes place in which each cell is transformed into a "liquid crystal" of peroxide. This is the notion of "bacterial mist", each micro - organism contributes to its own destruction.



Examples of contamination on surface

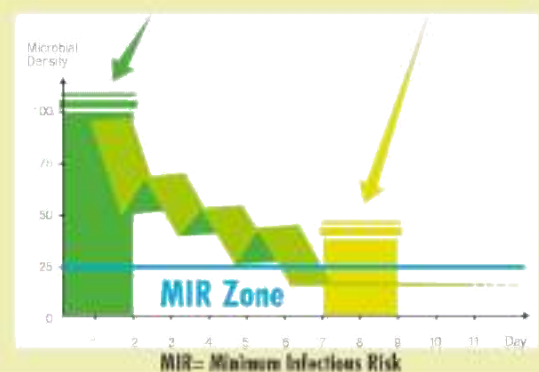
SELF - DESTRUCTION OF BACTERIA

Chlorine is naturally present in micro - organisms and under the action of free radicals it is transformed into active chlorine, destroying the bacteria. The silver atoms which are present in the solution have an effect on the surfaces of the premises treated, inhibiting the growth of newly settled micro - organisms.

Minimum Infectious Risk is obtained after a few days of regular application of the product and maintained at its minimum by the simple daily use of Nocospray.

3 ACTIVITIES FEATURES

- 1 High Speed Diffusion:**
Concentration of the Nocolyse active principle by desiccation, forming a "dry fog".
- 2 Ionization of radicals**
Increase of the bactericidal effect.
- 3 Catalytic action of silver atoms**
Increase in Nocolyse's rate of action and its remanence.





AERIAL BIODESINFECTION H₂O₂ BASED

I – DEFINITION OF AERIAL DISINFECTION

Aerial disinfection arose from using a diffuser and a disinfecting liquid product together to distribute a dry disinfectant fog.

It enables the air and surfaces in a room to be treated automatically using a range of fully biodegradable hydrogen peroxide-based disinfectants.

The important fact is to create a disinfectant fog light enough to go on 100% of the surfaces of the treated room.

The aerial disinfection system, which disinfects surfaces automatically, can be used in any environment where it is important to achieve a minimum infection risk.

The most sensitive environments are those in the health sector, where the risk of contamination, specifically from nosocomial infections, is non-negligible. These sectors are particularly exposed to contamination by agents and to the proliferation and spread of those agents, by virtue of the high number of people they treat.

Furthermore, the development of ever-increasingly costly electronic equipment has resulted in great caution being exercised in use and when disinfecting: no corrosion or residues are tolerated in these circumstances, and this is the underlying principle behind this concept.

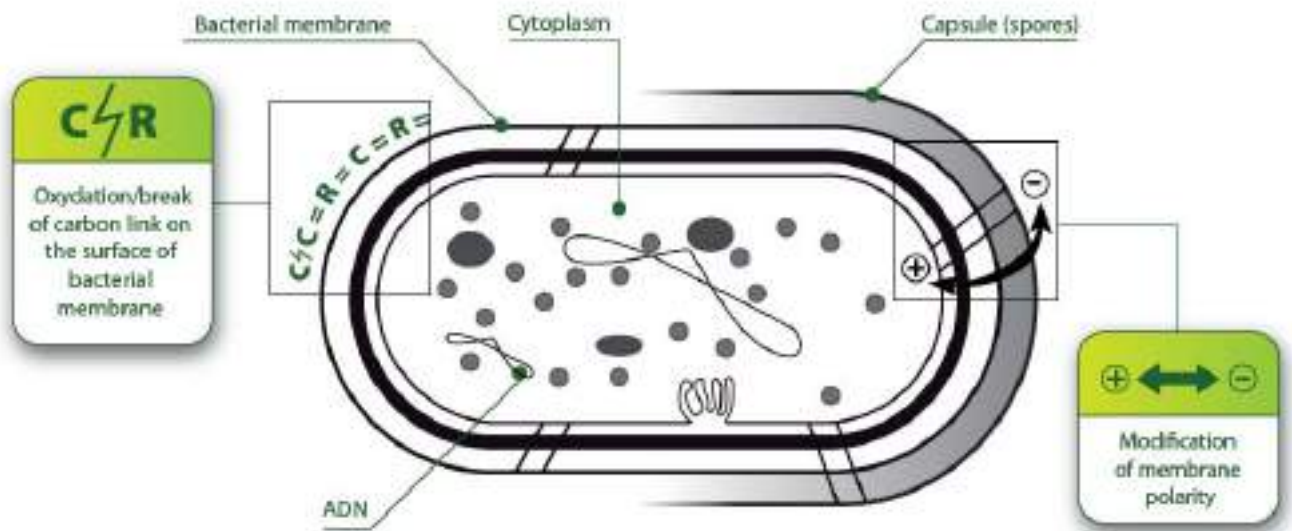
The concept we will examine will couple a diffuser using a heating and ionizing turbine and a disinfecting liquid based on H₂O₂ with few ppm of silver nitrate.

II – THE AIM

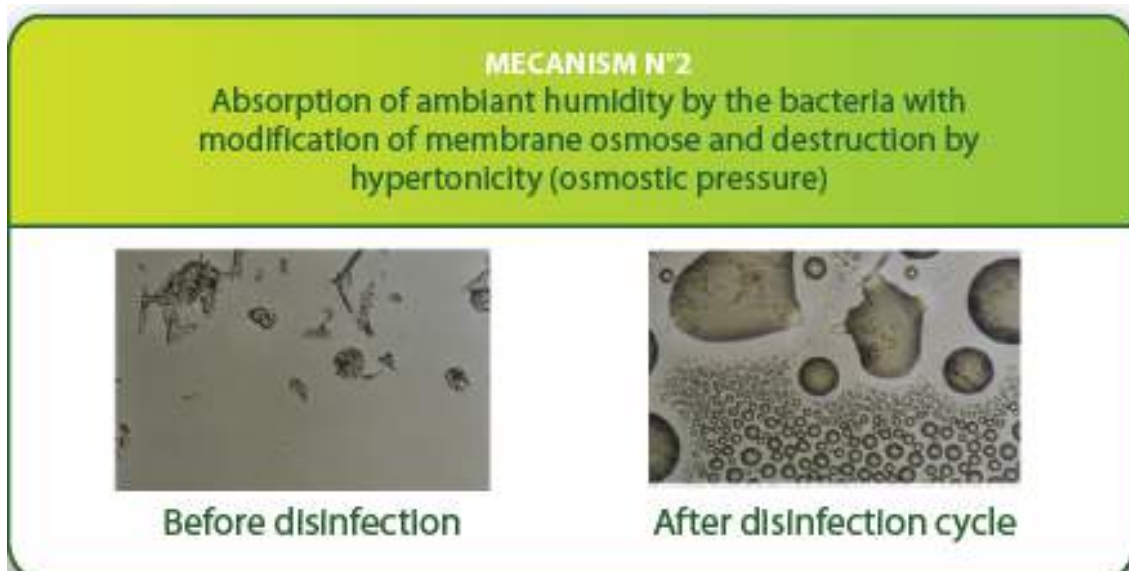
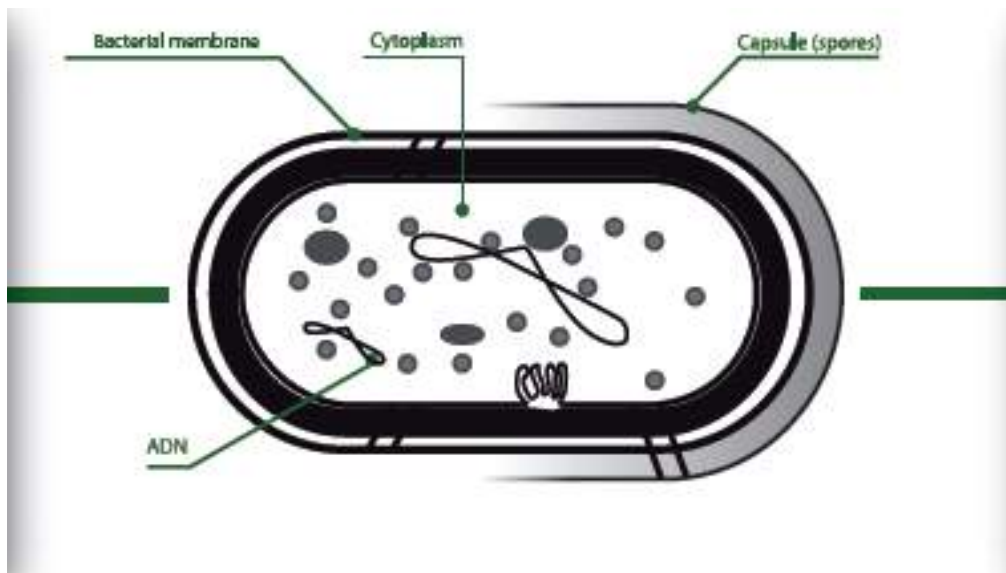
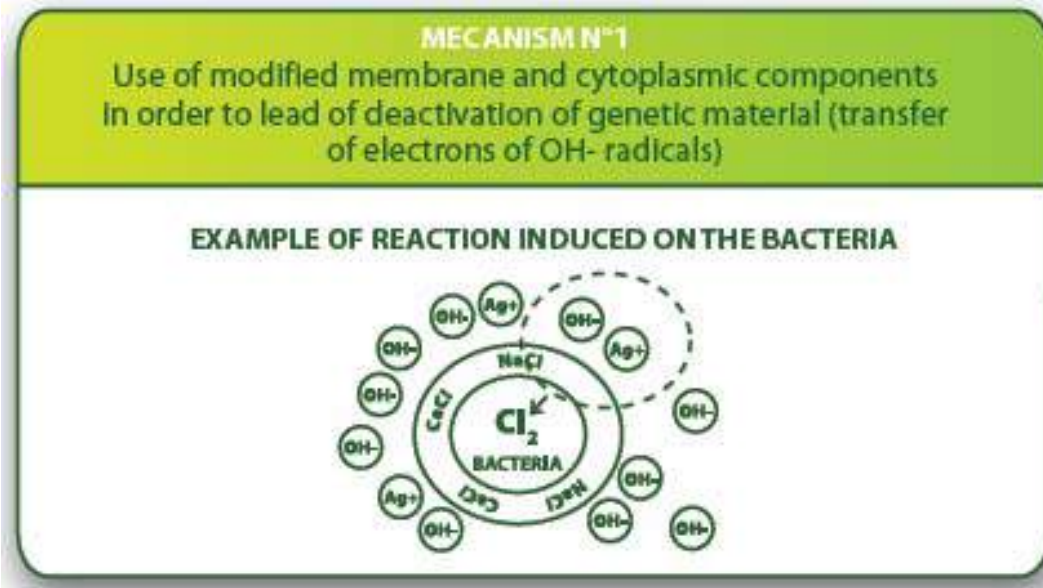
Diffusing it as a gas (as particles 5μ in size), makes it possible to deactivate and destroy bacteria by modifying the permeability of their membrane using electrons created by OH⁻ radicals. The water present in the air can thus penetrate the bacteria, which are then destroyed by osmotic pressure.

2 complementary mechanisms accelerate the process :

- a- destruction of the membrane carbon bridges ;



b- the use of self-compounds of the bacteria transformed partly in active chlorine and the penetration of the water in the bacteria to destroy it by osmotic pressure.



III – ELECTRONS ACHIEVEMENT

Electrons are obtained as fast as all necessary parameters to their production are immediately put in place.

The most efficient is to use a heating and ionizing turbine which ionize immediately exhaust air thanks to :

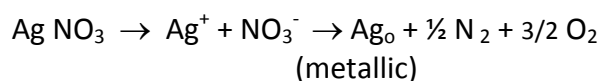
1. Exhaust temperature at 40°C
2. Exhaust speed of the air at 80 m/sec assured by the turbine rotation at 22.000 rpm

Then, through a venturi effect, the disinfecting liquid based on H₂O₂ and silver nitrate goes up in the whirlwind by micro-droplets which break into and charged themselves with the positive and negative charges of the ionized air. Silver, due to its huge electro positivity, will create an immediate and important positive potential thanks to Ag⁺ ions creation. By natural compensation reaction, hydrogen peroxide will transform itself in transitional OH⁻ radicals which will be recombined in water and in oxygen after having made free their electrons on the bacteria's membrane.

Reaction equation : Positive electrical potential of 1 Ag⁺ = Negative potential of 10⁶ OH⁻

IV – SILVER DECOMPOSITION

The original silver complex is decomposed according to the following reaction:



There is still in the end only some nitrogen, oxygen and elementary silver under a metallic form. The initial silver dose contained in 1 ml of a 6% of H₂O₂ and 30 ppm of silver solution is 0.03 mg/ml. Within the framework of a normal treatment of 1 ml/m³, the dose settled will be 40.000 times lower than the dose defined by the toxicity limits. Silver is non toxic because it would require a daily treatment of a 50 m³ room during 120 years to reach the toxicity point. Moreover, such a reasoning should take in account the hypothesis that only 1 human should have absorbed daily and totally the silver settled everywhere in the treated room, without any cleaning or ventilation of the room. This demonstration shows the impossible toxicity of such a silver amount.

V – H₂O₂ DECOMPOSITION

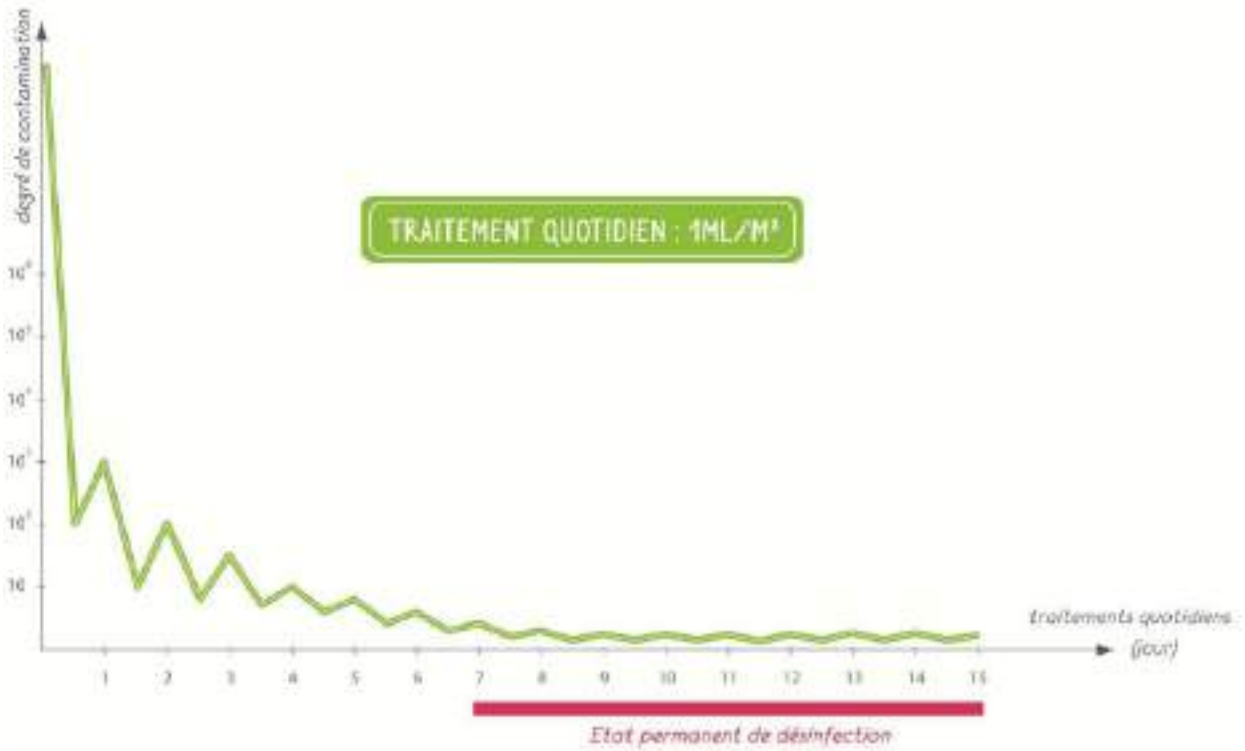
1) **Liquid** : H₂O₂ → H₂O + O⁻ → H₂O + FeO if in contact with iron
: under a liquid form, hydrogen peroxide is thus oxydant.

2) **Gazeous** : H₂O₂ → 2 (OH)⁻ → H₂O + ½ O₂
: no corrosion.

When a compressor is used instead of a heating and ionizing turbine, exhausted hydrogen peroxide remains liquid and is therefore oxidant.

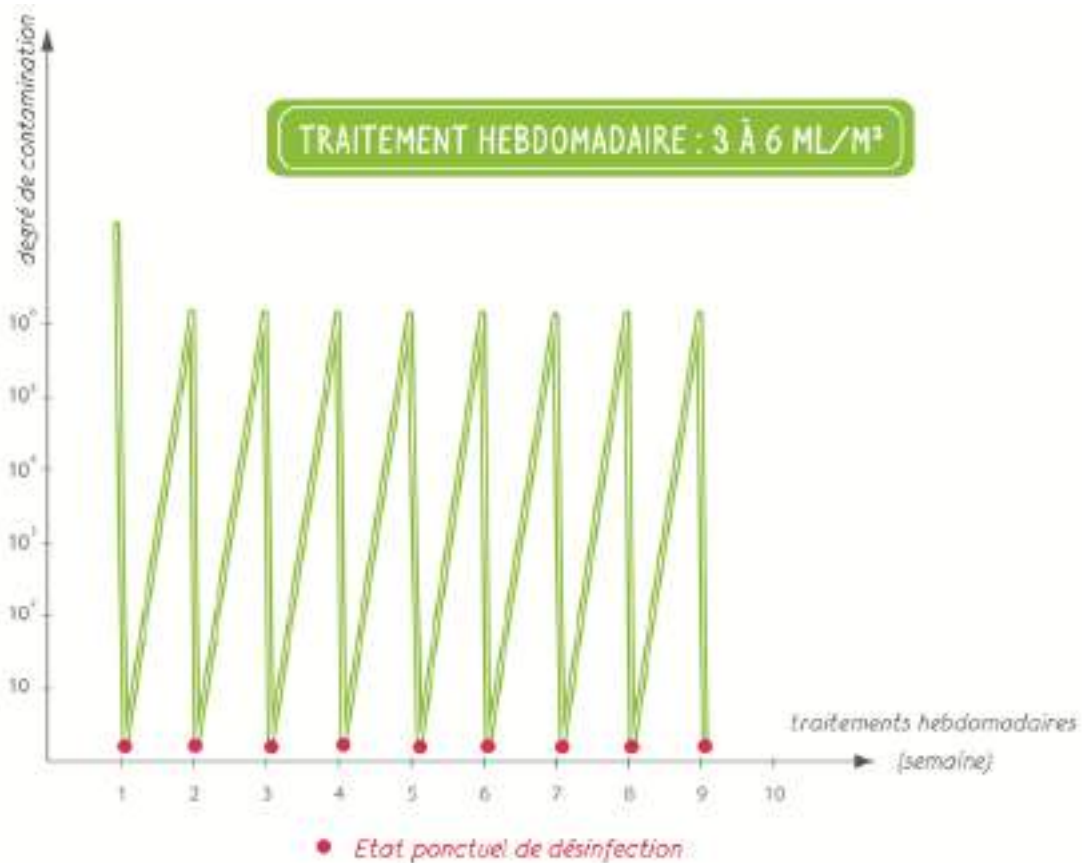
VI – PROCESS TREATMENT MODE

1) Preventive : Daily treatment



Contact time before entering back in the treated room = 30'

2) Curative : Ad hoc or weekly treatment



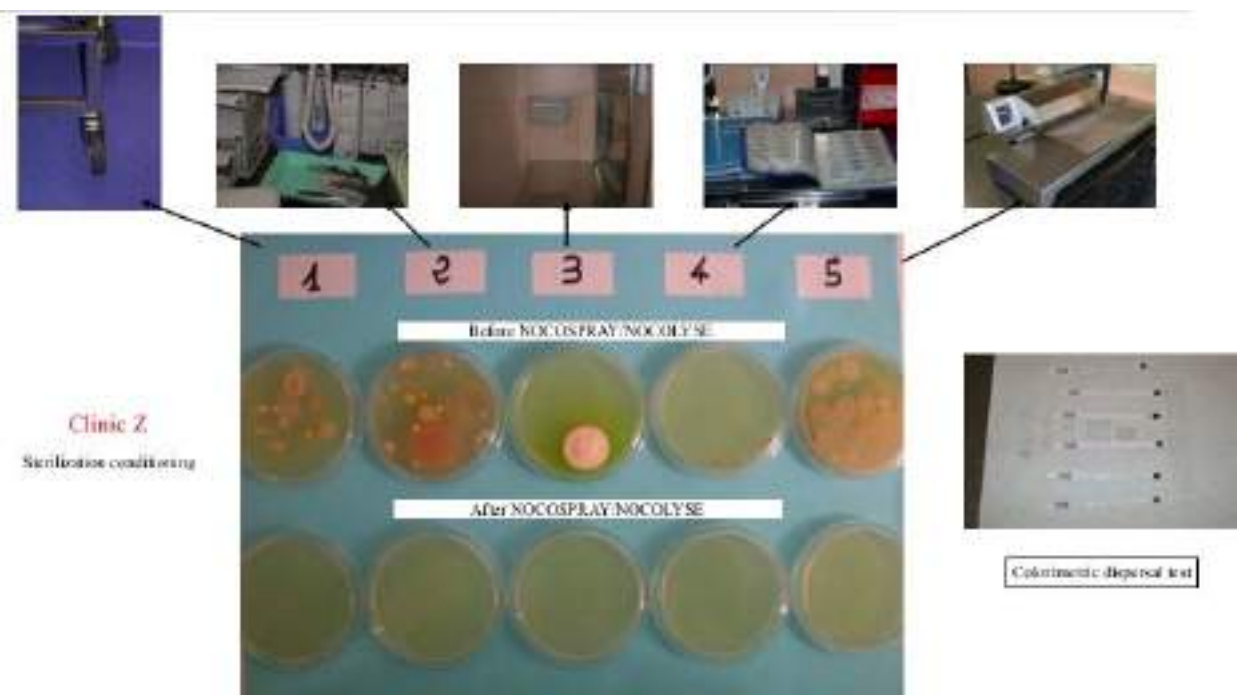
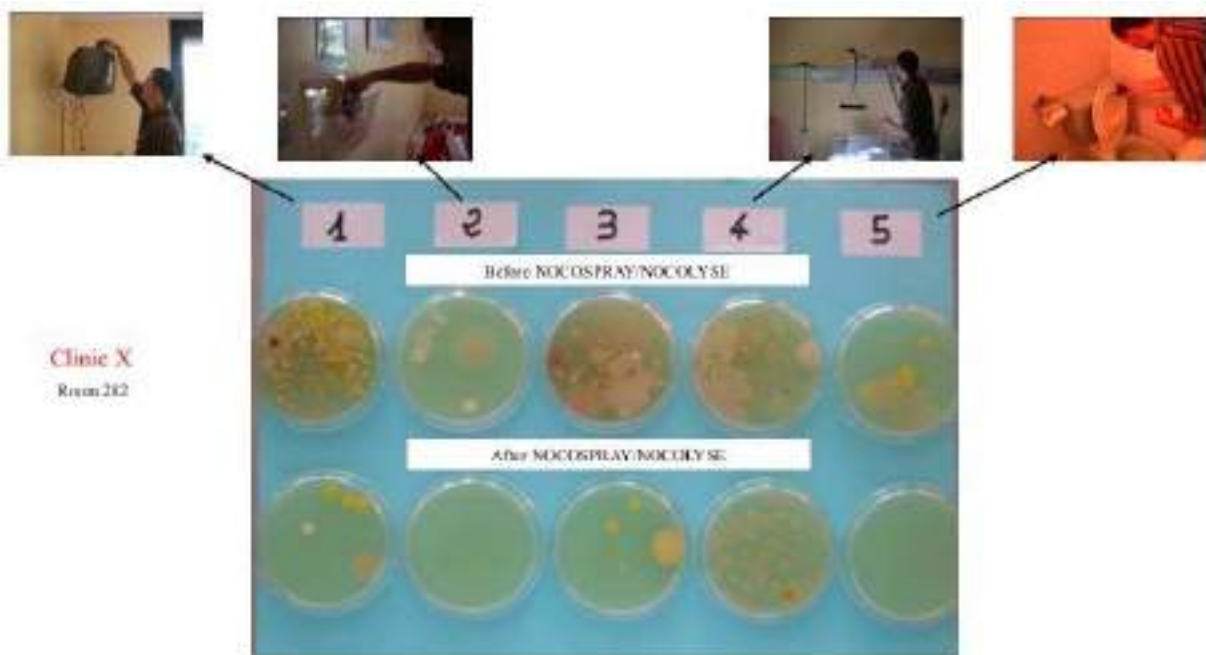
The result showed with a preventive treatment is a uniformly low contamination in the time with a small amount of disinfecting liquid used daily.

The good result showed with a curative treatment is occasional and needs a more important dose of disinfecting liquids, which increase the relative humidity and can lead to a gas recondensation if the room temperature is lower than 12°C. That is why it is very important not to use a compressor but a heating and ionizing turbine to obtain a uniform diffusion with any condensation

VII – CONTROL SAMPLES

PETRI DISHES : sampling before and after treatment in the same place

H2O2 COLORIMETRIC STRIPS : detect the presence of H2O2



VIII – GENERAL ADVANTAGES OF THE CONCEPT

- 1- No residue
- 2- No oxydation
- 3- No allergies
- 4- No toxicity
- 5- No germ resistance (the concept demonstrated its efficiency on 100% of the germs)
- 6- Products fully biodegradables
- 7- Reliability
- 8- Easy to transport and to use
- 9- Only technology on the market obtaining such a result with 1ml/m³ of disinfecting product
- 10- Time savings for people with the insurance of an homogenous diffusion, meaning a repeatable efficiency

IX – AREAS OF USE IN HOSPITAL

DEPARTMENTS:

- Operating theatres
- Intensive cares
- Laboratories
- Rooms (hospitalization & recovery rooms)
- Consulting rooms
- Isolation unit (treatment after the end of isolation period)
- Cytotoxic preparations (with laminar flow cabinets)
- Hyperbaric chambers
- Preparation for parenteral nutrition
- Gynaecological Department
- Orthopaedic Department
- Forensic Department
- Dental Implantology

EQUIPMENT :

- Respiratory assistance devices
- Pressure relief mattresses (anti-bedsore)
- Laminar flow cabinets

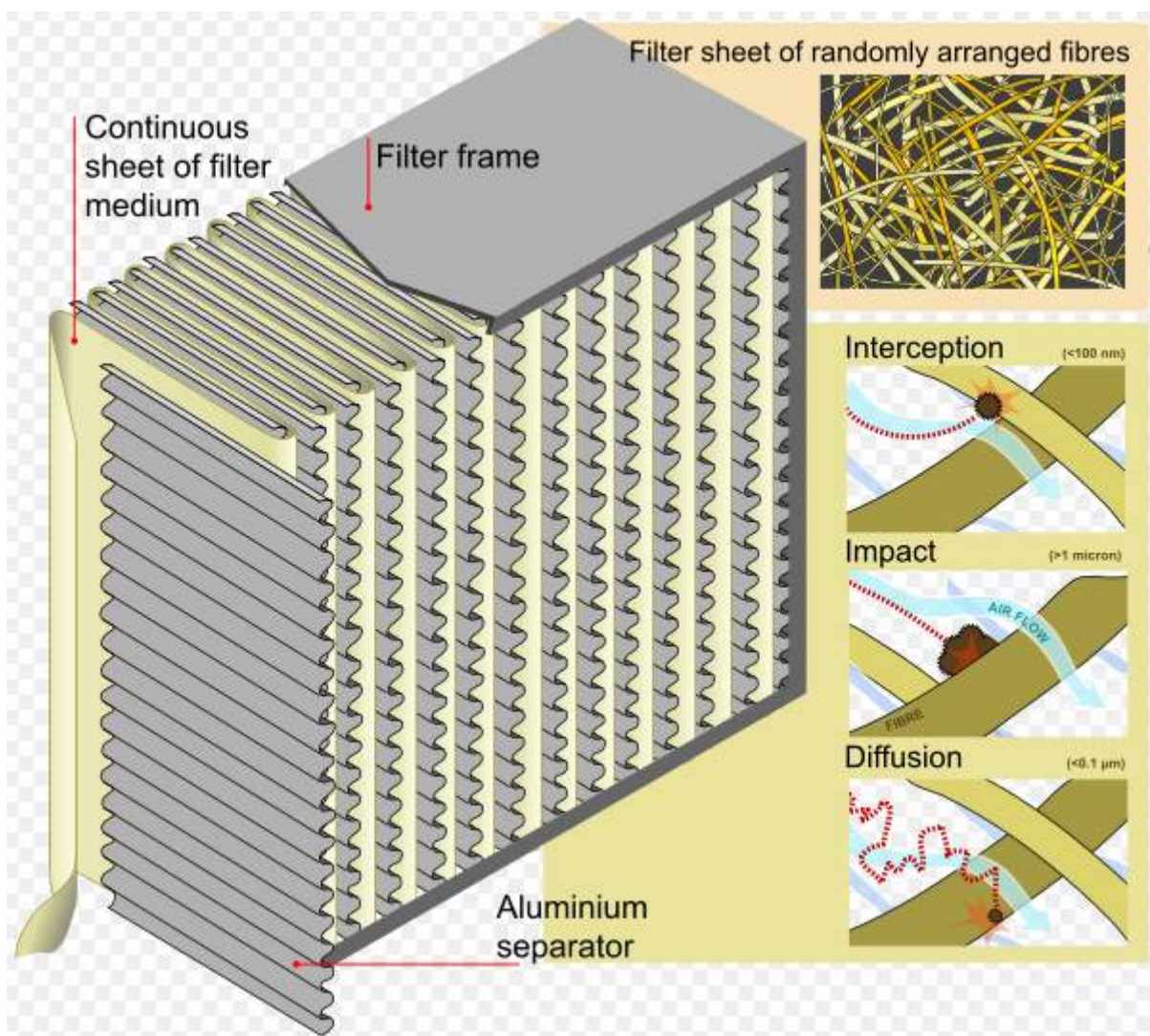
X – H₂O₂ BIODISINFECTION + HEPA FILTER

HEPA filters are composed of a mat of randomly arranged fibers. The fibers are typically composed of fiberglass and possess diameters between 0.5 and 2.0 micrometer. Key factors affecting function are fiber diameter, filter thickness, and face velocity. The air space between HEPA filter fibers is much greater than 0.3 µm. The common assumption that a HEPA filter acts like a sieve where particles smaller than the largest opening can pass through is incorrect. Unlike membrane filters, where particles as wide as the largest opening or distance between fibers cannot pass in between them at all, HEPA filters are designed to target much smaller pollutants and particles.

These particles are trapped (they stick to a fiber) through a combination of the following three mechanisms:

- a- Interception, where particles following a line of flow in the air stream come within one radius of a fiber and adhere to it.
- b- Impaction, where larger particles are unable to avoid fibers by following the curving contours of the air stream and are forced to embed in one of them directly; this effect increases with diminishing fiber separation and higher air flow velocity.
- c- Diffusion, an enhancing mechanism is a result of the collision with gas molecules by the smallest particles, especially those below $0.1\ \mu\text{m}$ in diameter, which are thereby impeded and delayed in their path through the filter; this behavior is similar to Brownian motion and raises the probability that a particle will be stopped by either of the two mechanisms above; it becomes dominant at lower air flow velocities.

Diffusion predominates below the $0.1\ \mu\text{m}$ diameter particle size. Impaction and interception predominate above $0.4\ \mu\text{m}$. In between, near the Most Penetrating Particle Size (MPPS) $0.3\ \mu\text{m}$, both diffusion and interception are comparatively inefficient. Therefore, the HEPA specifications use the retention of these particles to define the filter.



It is possible to use permanently a HEPA filter and to combine it with it the use of H₂O₂ disinfection. H₂O₂ diffusion will not affect the HEPA filter.

HEPA filter is made to catch particles but will not disinfect anything in the room. Each time somebody will enter in the room, bacterias will also enter and grow on surfaces.

H₂O₂ will disinfect both air and surfaces.

You can measure the efficiency with air diagnostic for air measurement and surface diagnostic.