



**Tested against
multidrug-resistant bacteria**
University of Padua



**Tested
against SARS-CoV-2**
University of Padua



VOCs



Smells



Bacteria



Moulds



Viruses

JONIX
pure living

EMANUELA

ANDREA

NICOLETTA

LUCA

ANNAVITTORIA

VALENTINA

CHIARA

MATTIA

MICHELA



FRANCESCA

LUCIO

MARIO

MARCIO

ELENA

ANTONIO

MAURO

LUCA

GUIDO

MICHELE

MINA

MONJA

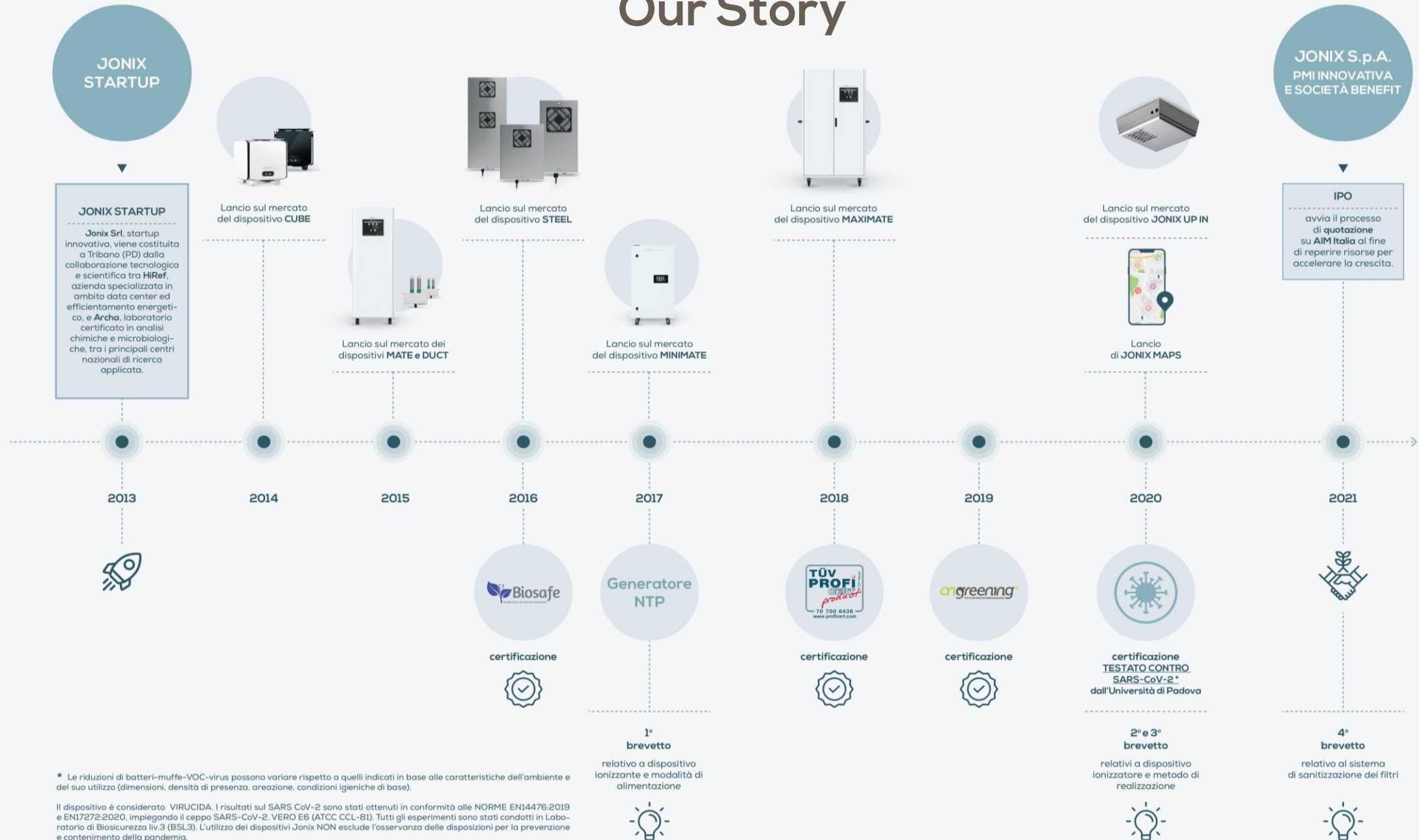
ANTONIO

We are air treatment experts, chemists, biologists and technicians.

With roots in Veneto, Emilia, Tuscany and our roots are in Veneto, Emilia, Tuscany and we have our sights set on the world. We are passionate seniors, gifted with that flexible creativity that only experience can bring.

We are young graduates with the energy of those who want to experiment and absorb as much as possible. And we think and design every project, day by day, by working closely together with open conversations and mutual learning: our strength is the osmosis of knowledge, the synergy between the fresh ideas of those who are at the beginning of their journey and the practical wisdom of those who have already seen and known a lot.

Our Story





4 MAY 2021 : Jonix is listed in the stockmarket

«To be listed in the stock market allows to **expand and diversify the financial sources**, to **strengthen the productive and commercial structure**, and **convey the company's value**.

It was a long and complicated journey that required great commitment and one that we wished to specifically **support becoming a benefit company**. This because we're sure that it's possible to make profit and at the same time create virtuous products, relationships and impacts that enhance everyone, the people and the planet»

Our qualities

Benefit company

We have chosen to share a **responsible business model** aimed at **creating shared wellbeing** to amplify the positive impact on the environment, society and people.

Anticipate the market

We started with a **real problem**: the **healthiness of the air in closed environments**. We were aware that we were ahead of the market, but that didn't stop us. Ours are devices of a culture of sanitation.

Made in Italy

We have made our products entirely in Italy, selecting **suppliers who represent the best of the Italian manufacturing identity**.

Social collaboration

In order to **develop sustainable partnerships**, we have entrusted the production of some components of our technology to Sol.Co, a **social enterprise** that transforms people's skills into resources.

Research and experimentation are crucial elements for us: for our devices, we use a form of ionization that we have directly tested and analyzed from a chemical, microbiological and physical point of view, in certified laboratories and in our technical-scientific area, the JONIX^{LAB}.



R&D



Technical client assistance



Analytical tests for efficacy



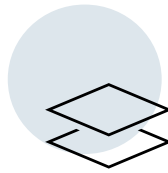
Patent analysis



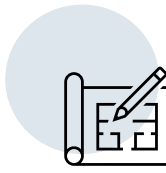
Creation of scientific/technical articles



Regulatory context analysis



Conception and planning of the design

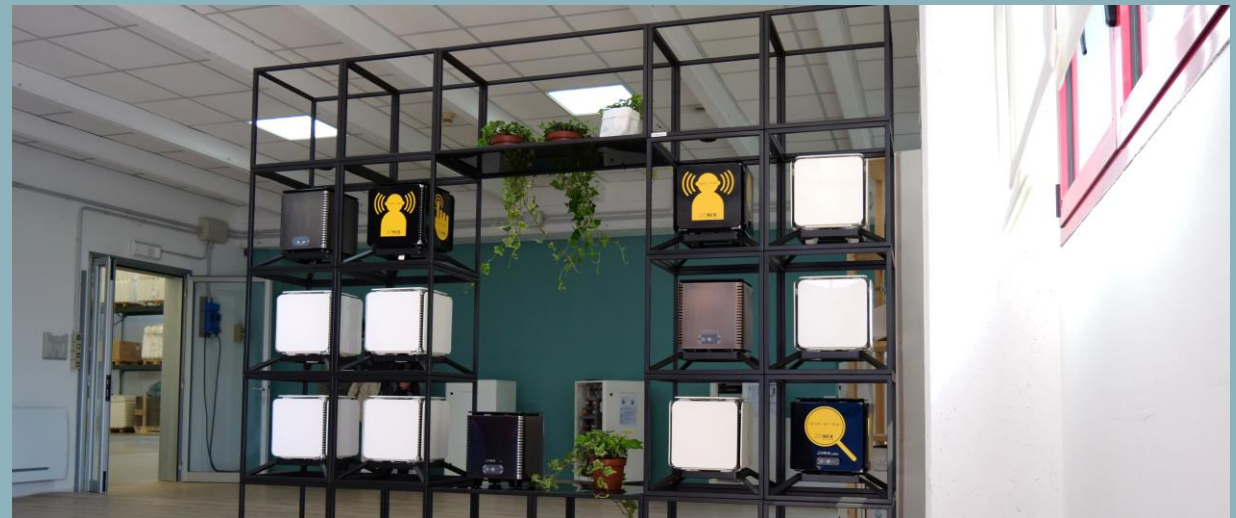


Design and construction of pilot plants

JONIX In the world



JONIX Factory





To improve people's quality of life at home and at work!

We offer effective, **fast** and **applicable solutions** in all areas where it is required to **eliminate contaminants**.



Systems of sanitization of indoor air with NTP (Non Thermal Plasma)



VOCs



Smells



Bacteria



Moulds



Viruses



520.695.752.000

**SANITIZED CUBIC METRES OF AIR
FROM 2014 TO 2021**

VIRUCIDAL EFFECTIVENESS REPORT

Quantitative test in suspension for the evaluation of virucidal activity
against the SARS-CoV-2 virus

PRODUCT:

JONIX CUBE
air purification device

CLIENT

Jonix S.r.l. Address: Viale Spagna, 31/33 - 35020 Tribano (PD)
VAT and Tax Code 04754080283

SCIENTIFIC RESPONSIBLE:

Prof. Andrea Crisanti

Research assistants: Dott.ssa Claudia Del Vecchio, Dott.ssa Manuela Sciro, Dott. Di Pietra
Giuseppe

Report Date: 22/09/2020



Tested
against **SARS-CoV-2**
University of Padua

The **Department of Molecular Medicine**, directed by prof. Andrea Crisanti, has tested the **Non Thermal Plasma** technology adopted in Jonix devices in laboratory to verify its **virucidal activity**.

The results obtained show that the tested device (JONIX cube - Non Thermal Plasma technology) has an **effective antiviral activity** against SARS-CoV-2 (the so-called Covid-19), with a reduction of the viral load up to **99,9999%**.

To ensure maximum precision and accuracy, the test was performed in compliance with the UNI EN 14476: 2019 standard "Quantitative suspension test for the evaluation of virucidal activity in the medical field - Test method and requirements (phase 2, stage 1)" and the UNI EN 17272: 2020 standard "Method for disinfecting indoor air by automated processes - Determination of bactericidal, mycobactericidal, sporicidal, fungicidal, yeasticidal, virucidal and phagocytic activity". The virucidal performances has been tested using the SARS - CoV-2 (Covid-19) strain. All experiments were conducted inside Biosafety Level 3 Laboratory (BSL3).

The Scientific Dossier is available upon request.

BACTERICIDAL EFFICACY TEST REPORT

Quantitative suspension test for the evaluation of bactericidal activity against MDR bacteria

PRODUCT:

JONIX CUBE
an air purification device

CLIENT

Jonix S.r.l. Address: Viale Spagna, 31/33 - 35020 Tribano (PD)
VAT number and TAX CODE 04754080283

SCIENTIFIC MANAGER

Prof. Andrea Crisanti

Collaborators: Dr. Claudia Del Vecchio, Dr. Manuela Sciro and Dr. Giuseppe Di Pietra

Report Date: 28/05/2021



Tested against
multidrug-resistant bacteria
University of Padua

The **Department of Molecular Medicine**, directed by prof. Andrea Crisanti, has tested the **Non Thermal Plasma** technology adopted in Jonix devices in laboratory to verify its **bactericidal activity**.

The results obtained show that the tested device (JONIX cube - Non Thermal Plasma technology), has an **effective bactericidal activity** against ***E.coli*, *Klebsiella pneumoniae*, *Acinetobacter baumannii* and *Pseudomonas aeruginosa***, with a **reduction of bacterial load up to 5 logarithmic units**.

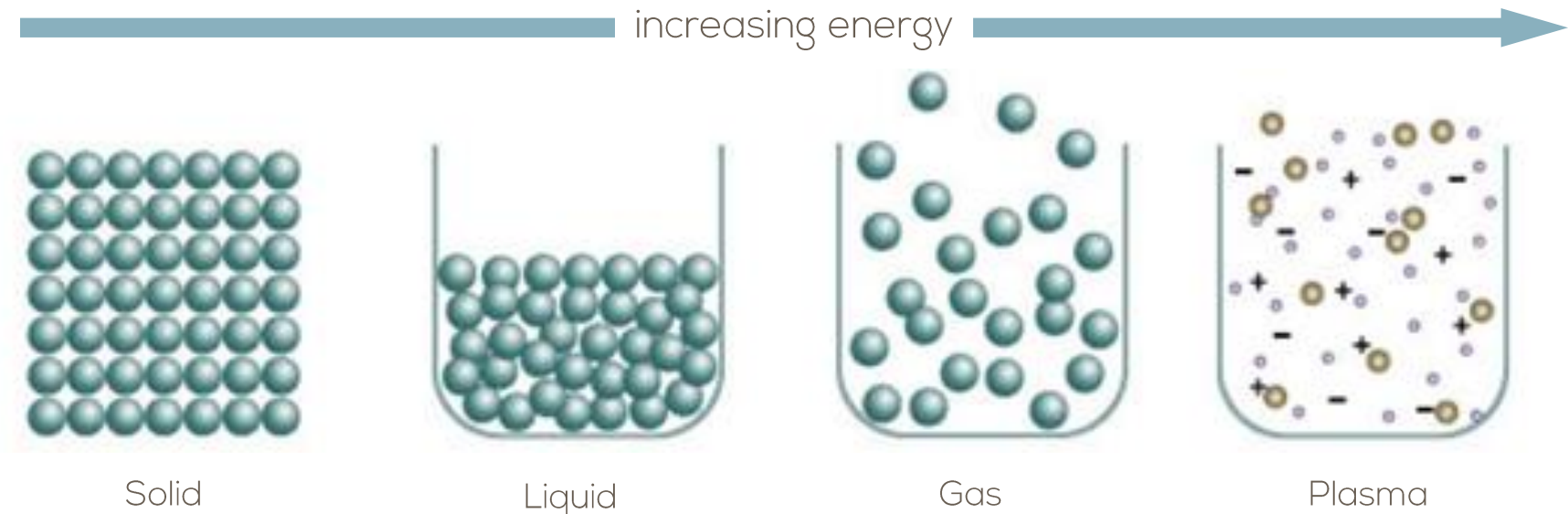
To ensure maximum precision and accuracy, the test was performed in compliance with the UNI EN 17272: 2020 standard "Method for disinfecting indoor air by automated processes - Determination of bactericidal, mycobactericidal, sporicidal, fungicidal, yeasticidal, virucidal and phagocytic activity". The bactericidal performances have been tested using a known microorganism (*E. coli*) and 3 gram negative multidrug resistant microorganisms (*Klebsiella pneumoniae*, *Acinetobacter baumannii* e *Pseudomonas aeruginosa*).

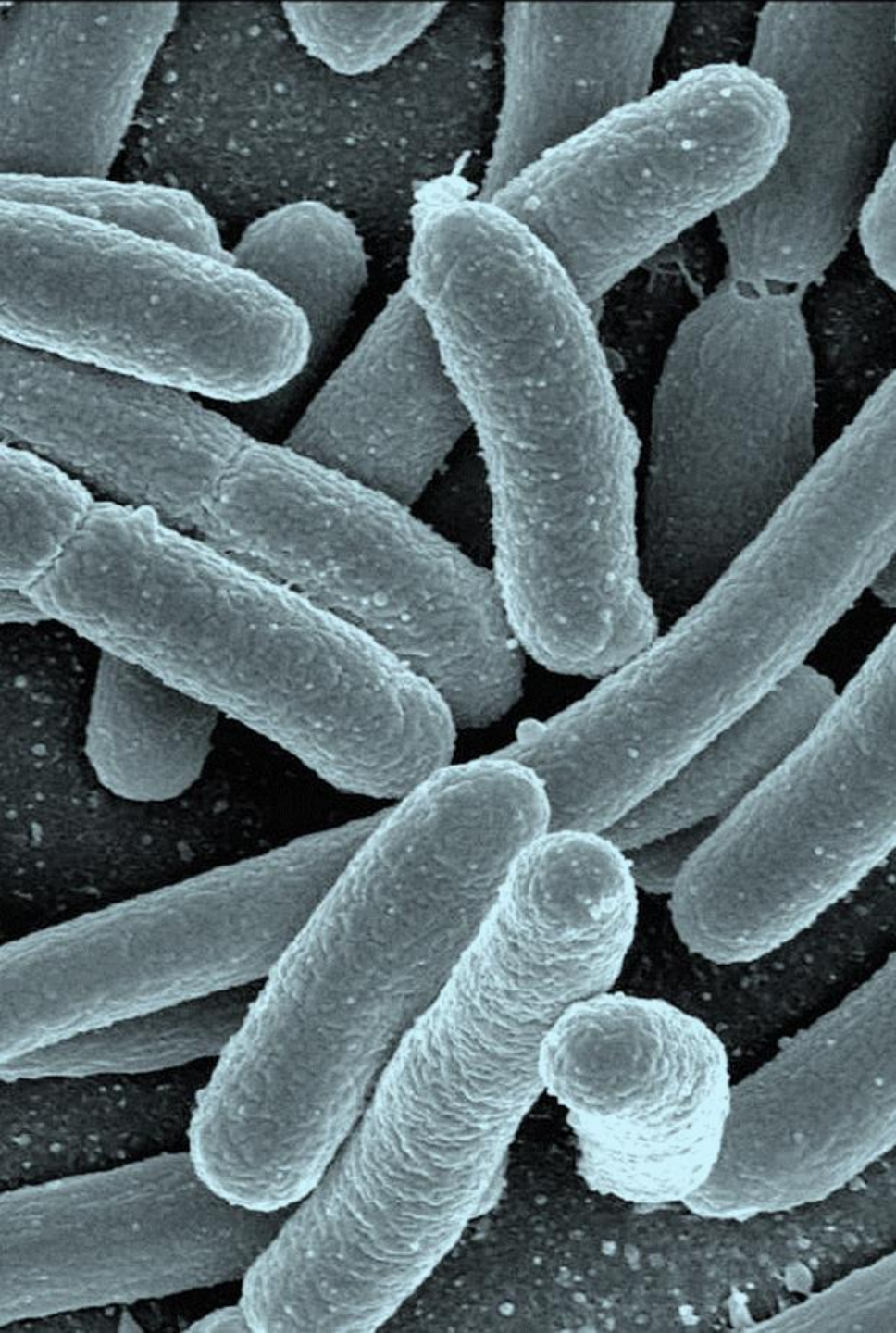
The Scientific Dossier is available upon request.

Plasma

is the fourth
state of
matter

- It's a **blend** of ionized gases, composed of **energized elements**, which is in general **neutral** (total charge)
- This is called the "**fourth state**" of matter, which differs from the solid, liquid and gaseous state

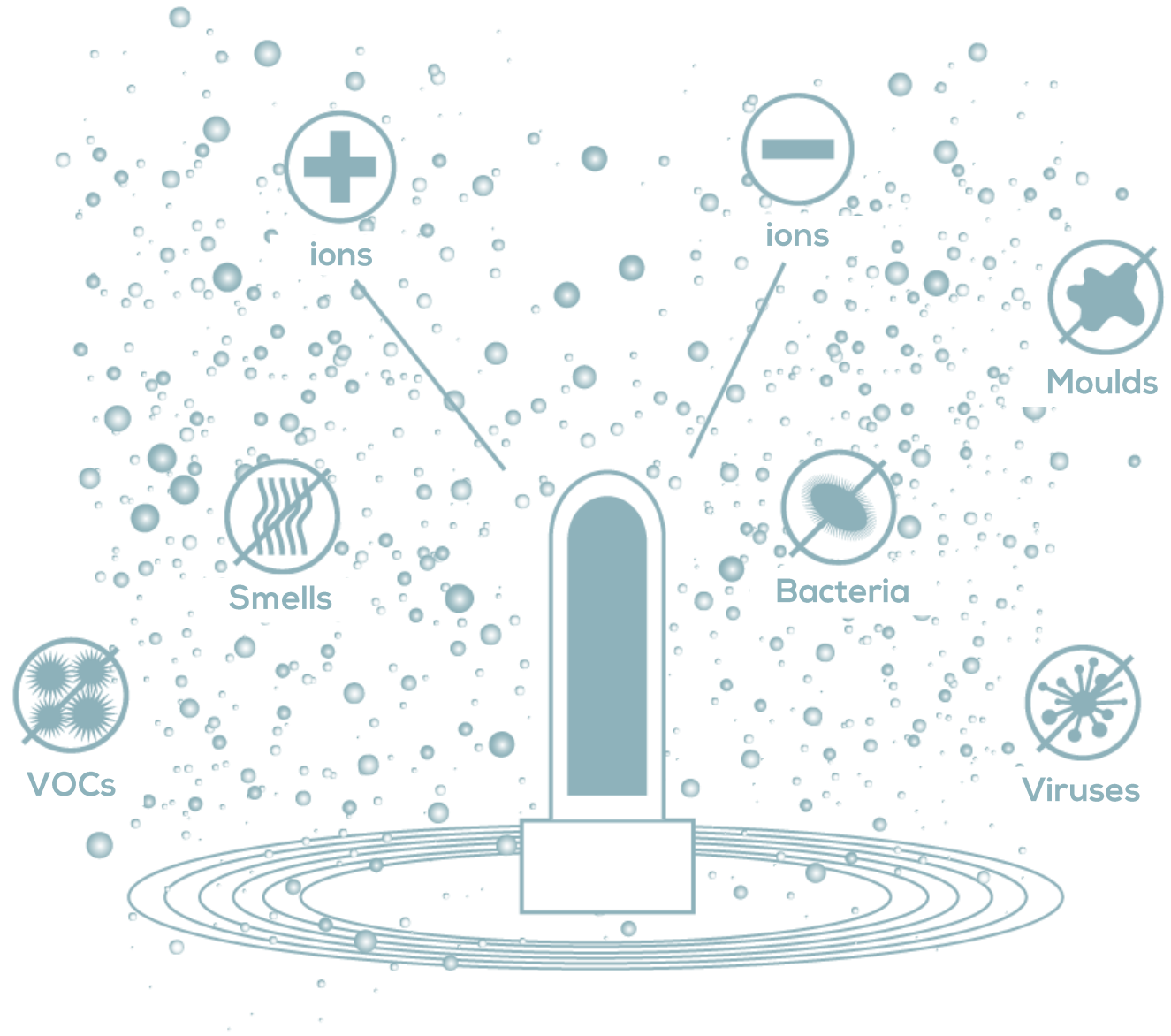




NTP Non Thermal Plasma

- Non Thermal Plasma technology presents disinfecting and **sanitizing effects** against bacteria, virus, spores, molds, and other pathogens.
- **Electrons** are strongly **reactive**: number of chemical and physical processes such as oxidation, over-energizing of atoms and molecules, to **produce of free radicals and other reactive particles**.
- These **particles** are **carried by the air flow against pathogens elements**.

NTP
Technology
by JONIX

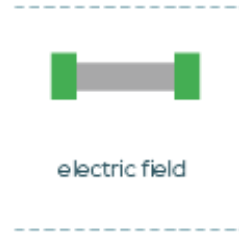


Non Thermal Plasma JONIX

NTP
Technology
by JONIX

1

Plasma generated with DBD (Dielectric Barrier Discharge) at room temperature (can be used in biological systems).



2

The air is passed through an electric field and the electrons of the molecules of this gas are accelerated.

AIR
Neutral molecules
[O₂, N₂, H₂O, CO₂...]

3

These electrons come into contact with other air molecules which in turn are activated leading to the formation of oxidizing species (O, O₃, 1O₂, •OH, O₂, •-•OOH, •NO, ONOO- and OONOO-, H₂O₂, NO₂-, NO₃-).

4

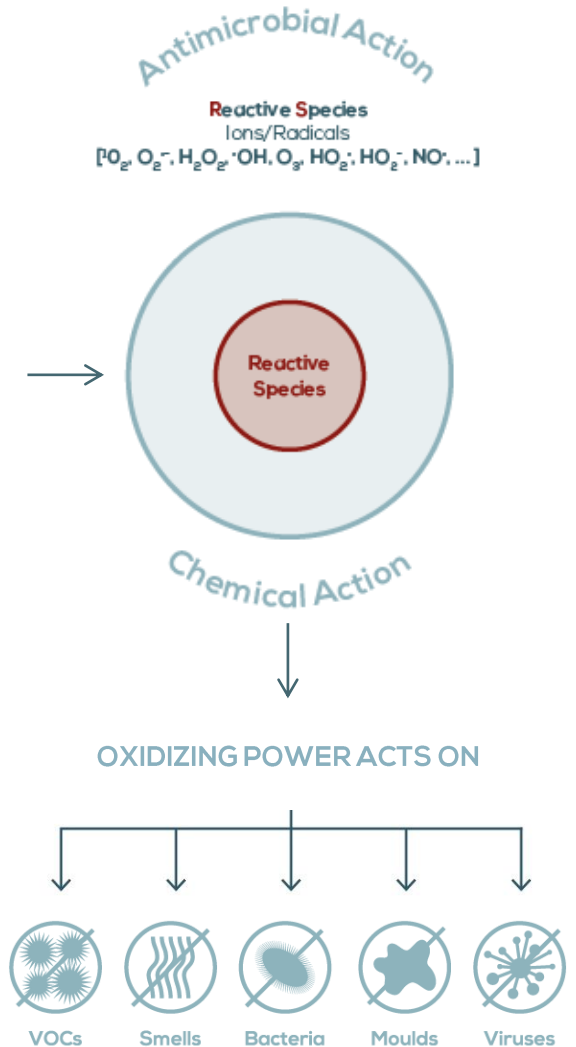
Biological components (bacteria-viruses etc.)

The oxidizing molecules react with the components of the cell membrane (phospholipids and proteins) of biological microorganisms and destroy them, opening a passage for the oxidants to enter the cell.

Here the oxidants also have the power to react with the nucleic acids of the DNA, breaking it into small fragments and rendering it unusable, eliminating the microorganism.

VOCs (Volatile Organic Compounds)

The activated molecules with oxidizing power react with VOC, oxidizing them in various steps until they are decomposed into harmless compounds..



NTP
Technology
by JONIX



Patented JONIX generator

- ✓ Low energy consumption
- ✓ High efficiency
- ✓ Low operating cost
- ✓ Can be inserted in free installation devices and in air conditioning systems



What differences from OZONE and UV?

- ✓ Compared to the ozonation systems it is compatible with the **presence of people**.
- ✓ Compared to the UV systems the oxidation capacity is **not affected by the speed of air flow** and it **affects the surface around the product**.
- ✓ Compared to the systems containing electrostatic filters or photocatalytic filters, **the sanitizing effect occurs at a distance from the plasma source, too**.

JONIX

Test and Certifications

LEED

ongreening[®]
THE PLATFORM FOR GREEN BUILDING

Estidama

HK Beam

WELL

TÜV
PROFI
CERT
product
70 700 6436
www.proficert.com

BREEAM

Biosafe
Certificazione di Sicurezza Ambientale

CE



SEAL OF
EXCELLENCE



JONIX devices

Ongreening®
and ProductMAP®
The Green Building
Platform



They contribute to meet the assessment requirements of ecological buildings and are present on the Ongreening® Platform.

Ongreening® is an **independent digital platform** dedicated to sustainability-focused practices and material data. Ongreening's mission is to **make green building easier and more accessible to all.**

Ongreening® combines invaluable resources on green building with an innovative material database, called ProductMAP®, which enables **informed product selection and decisions based on material performance and sustainability criteria.**



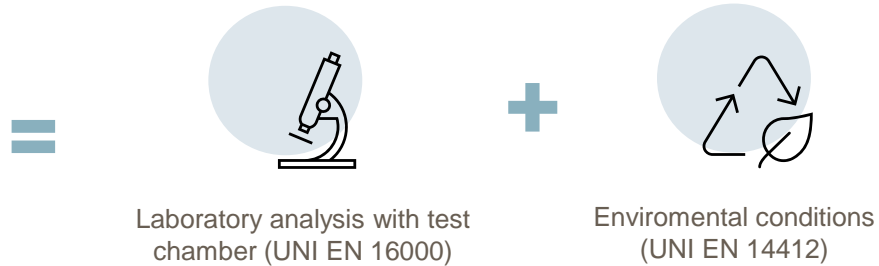
Validated JONIX products

Checking the air purification level

**Bio-safe®
Environmental
health certification**



JONIX products have been tested, according to the patented Bio-Safe® protocol which has **verified** and **certified** their effectiveness in **reducing pollutants**.



Passing all the stringent assessment thresholds has led these products to obtain the **Bio-Safe® Validation Seal**: a **guarantee mark which certifies excellent indoor living comfort**.

Bio-Safe® certifies environments equipped with Jonix air purification systems through a patented analysis protocol.



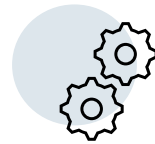
**Manufacturing
processes**

On-site audit on

**Product Quality
Certification of
devices**



TÜV PROFiCERT® Product certifies the quality of JONIX device **manufacturing processes through on-site audit.**



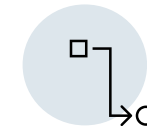
Business
management



Customer
satisfaction



Customer
satisfaction



Procedures
outline



Internal inspection of
company processes

TÜV logo **certifies** the **truthfulness of the data** and **performances** declared in the scientific dossiers and in the product catalogues.



Seal of Excellence Horizon 2020

Excellence of project proposal "JONIX AirPlasma"



The **European Commission**, within the EU framework programme for research and innovation 2014-2020, awarded JONIX with the **Seal of Excellence**. It certifies the **high-quality** of the project proposal "AirPlasma".

An international panel of **independent experts** recognized the high-quality of our proposal. This will help JONIX to further develop the NTP (Non Thermal Plasma) Technology for indoor air purification.

Seal of Excellence for the project "JONIX AirPlasma"

- Seal of Excellence
Horizon 2020





JONIX CE Marking

JONIX devices meet all the safety requirements of the applicable EC directives.

**Products compliant
with EU
regulations**

2014/30/UE

2014/35/UE

2011/65/UE

2012/19/UE

EN 60335-1:2012+A11:2014

EN 61000-6-3:2007+A1:2011

EN 60335-2-65:2003

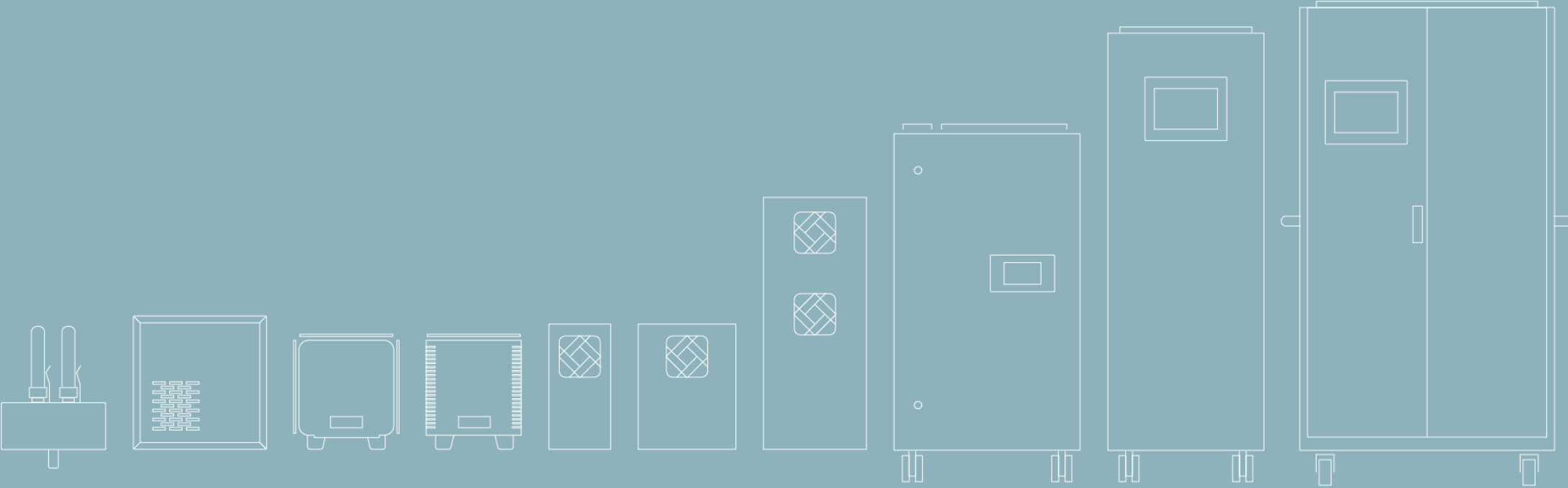
EN 55014-1:2017

EN 55014-2:2015

EN 62233:2008+AC:2008

JONIX

widest selection in the market



JONIX cube Line





JONIX cube

Designer sanitised air

JONIX cube is an air purification and sanitising device for air and surfaces, which can be used in the presence of people, even with fragile people without contraindications, helping to prevent airborne diseases and relieve symptoms related to respiratory problems (asthma, allergies).

JONIX cube utilizes the sanitising properties of cold plasma technology (JONIX Non Thermal Plasma Technology) to reduce contamination from bacteria, moulds, viruses, pollutants and odours present in indoor environments and which can directly affect the body's vital functions and our capability to feel good.

JONIX cube

Low energy consumption
Electric power compared to all the competitors

High efficiency
For areas up to 85 m²

It takes up little space
only 25 cm

Effective on microorganisms and VOC

Odours, no thanks!
Eliminates any kind of smell

No filters
JONIX doesn't use filters and requires low maintenance

Quick effect
In 10 minutes we turn the stale air into mountain air



JONIX mate Line





JONIX mate line

Ecological and compatible with the presence of people

JONIX minimate, JONIX mate JONIX maximate are mobile devices for air filtration and sanitisation with Non-Thermal Plasma technology.

With their three levels of filtration (G4+F7+H) and the sanitising function, they guarantee absolute filtration of suspended dust and the elimination of 99.9% of bacteria, viruses and moulds.

JONIX steel Line





JONIX steel line

All the safety of AISI 304 steel for your air

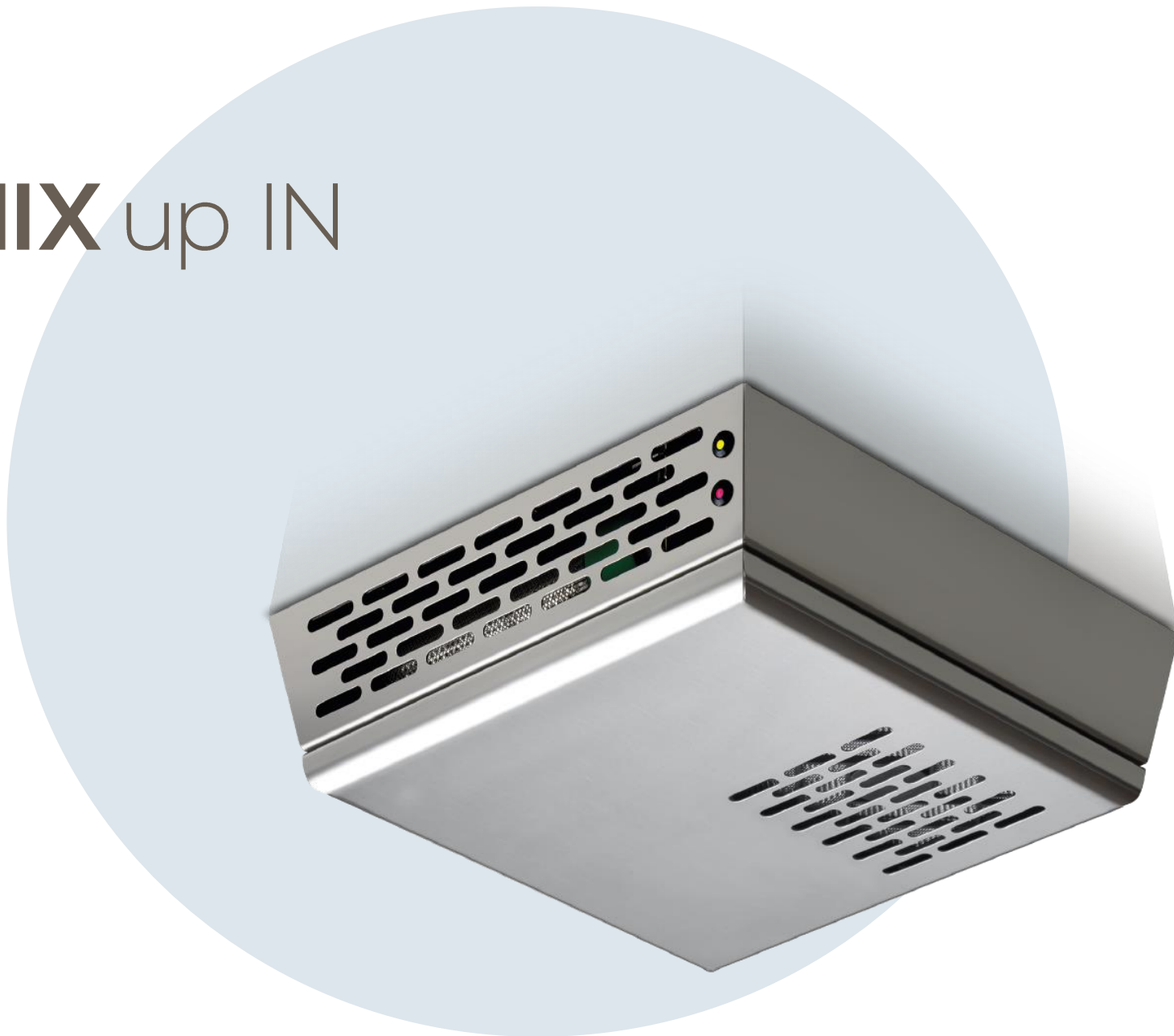
JONIX steel reduces biological and chemical contaminants and odours from all environments that require high hygiene standards in small spaces.

It does not need additional filters, making **management and maintenance costs extremely low.**

A product that guarantees continuous sanitisation, even during activities.

The biocidal and neutralization activity of pollutants can be measured even from the first hour of starting.

JONIX up IN





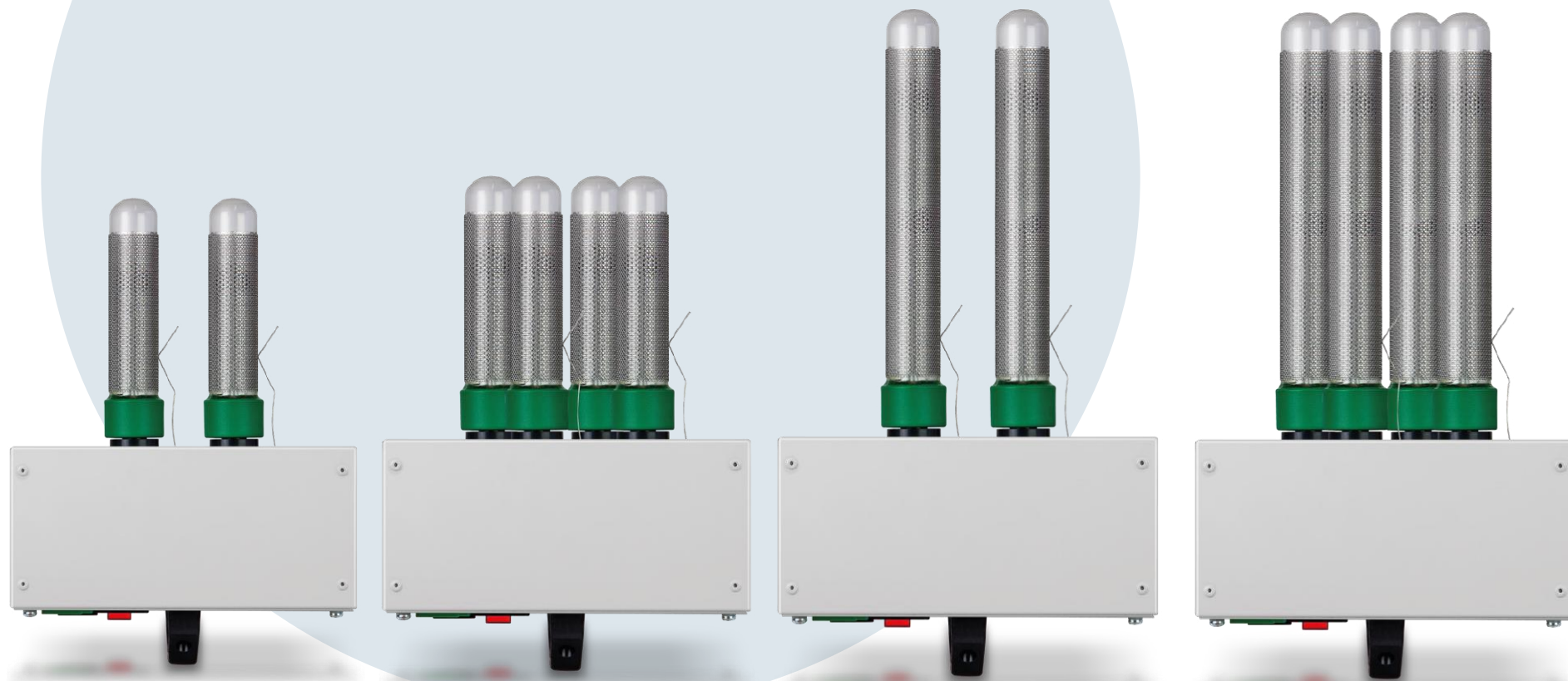
JONIX up IN

Compact and powerful for small spaces with high foot traffic

JONIX up IN is a **continuous sanitisation** unit for surfaces and indoor air with cold plasma technology, for small environments such as lifts, cubicles, changing rooms, fitting rooms or particularly quiet rooms such as offices, study areas.

JONIX up IN is a simple, essential and effective device, which can be installed on the wall or ceiling, you can modulate the fan speed, the hourly productivity of the sanitising air flow and remote control.

JONIX inside Line





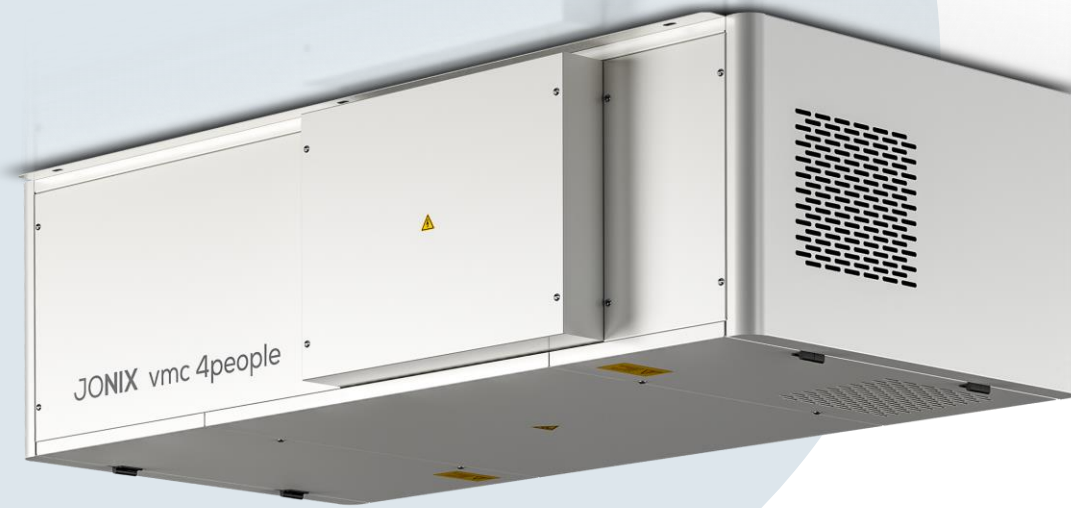
JONIX inside line

Sanitising internal surfaces and air, ducts, AHUs, fan coils, VMC

JONIX inside devices prevent the formation of chemical and biological contaminants, (moulds, bacteria and legionella) on internal surfaces and from the air in transit. Sanitisation takes place continuously, thus preventing dust deposits from becoming the ideal substrate for the development of moulds and bacteria.

The JONIX inside range are **sanitising devices with an essential design with advanced cold plasma technology** to prevent bacteria, moulds, viruses, pollutants and odours **from internal surfaces of ducting, air handling units and plenums** of controlled mechanical ventilation systems.

JONIX vmc 4people





JONIX vmc 4people

Airflow system with filtering, sanitisation and recovery of 90% of the heat

JONIX vmc 4 people devices are centralised ventilation units that combine the benefit of airflow with **heat recovery** with **filtering** and **sanitisation** with **advanced cold plasma technology** to **eliminate bacteria, moulds, viruses, pollutants and odours** from the environment.

The JONIX vmc 4 people devices are **compact, easy to install and use**, they can be fixed to the wall (in vertical or horizontal position) or the ceiling. They are suitable for environments where a large number of people accumulate, such as classrooms, professional kitchens, canteens and corridors.

JONIX Applications



Medical



Wellness and
beauty



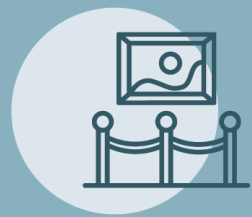
Ho.re.ca



Food



Business



Art

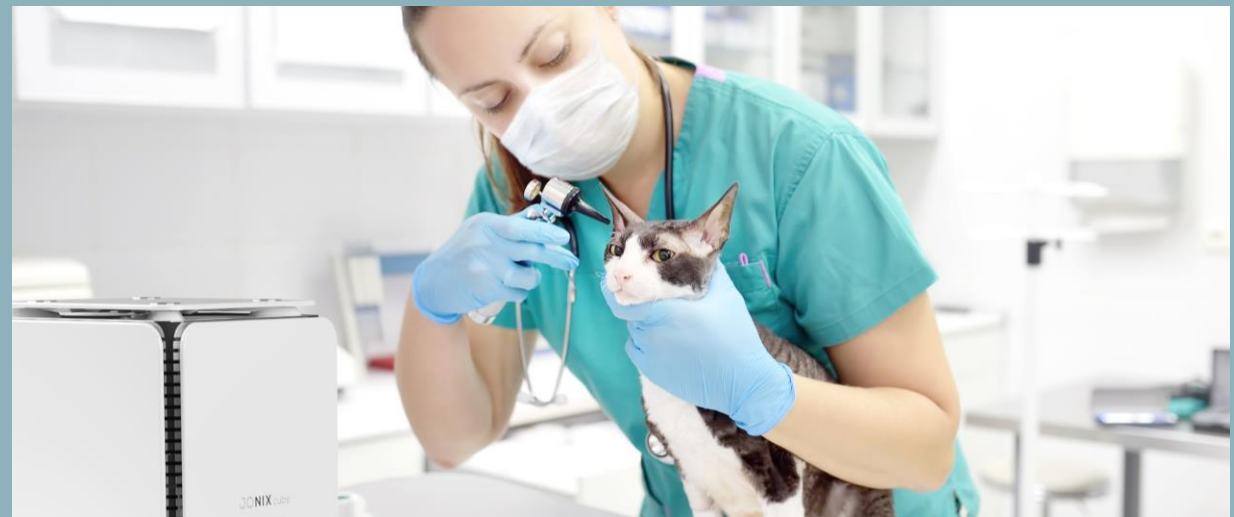


Residential



School

JONIX for medical



JONIX for the **healthcare** sector

Benefits:

- ✓ **Non-stop sanitising** of air and surfaces
- ✓ **Prevents** the spread of infections
- ✓ **Continuous remediation** of surgical and post-surgical areas
- ✓ **Decontaminates** canteens and professional kitchens
- ✓ **Eliminate** odours
- ✓ **Complete sanitisation protocols**

Where:

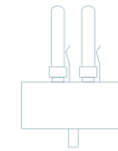
- Medical clinics
- Hospitals
- Dental offices
- Outpatient clinics
- Veterinary clinics
- Care homes
- Nursing homes



Cube Line



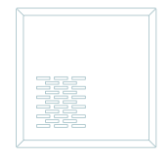
Steel Line



Inside Line



Mate Line



JONIX up IN



JONIX for the Healthcare

- ✓ Hospitals,
- ✓ Clinics,
- ✓ Rehabilitation centers



Mate line



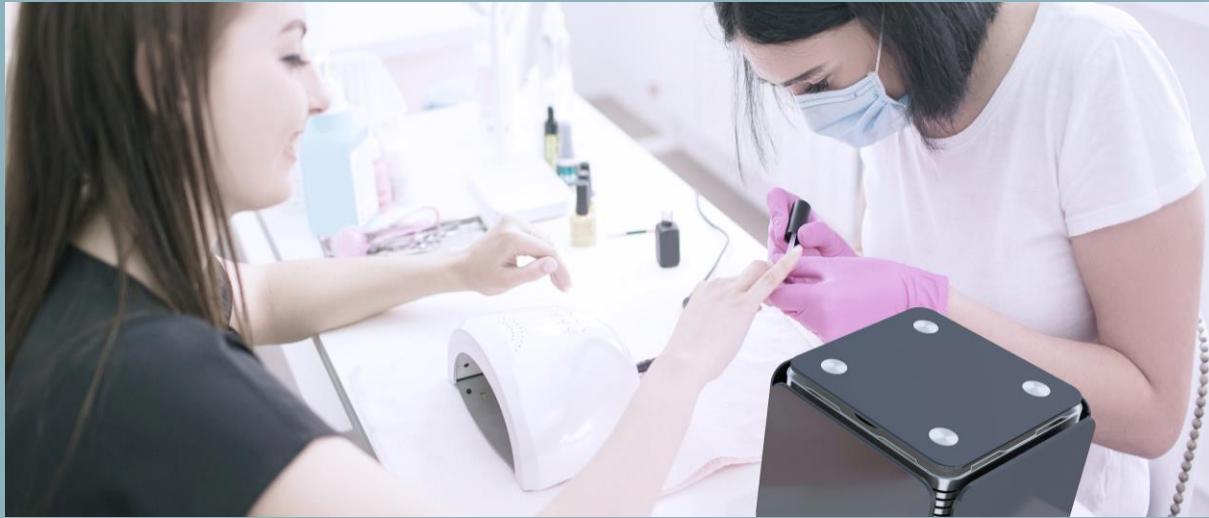
Inside line

JONIX mate Line and JONIX inside Line

- ✓ To **sanitise the HVAC air flow**
- ✓ To **decontaminate** internal surfaces
- ✓ To **eliminate viruses, bacteria, VOCs**
- ✓ To **prevent** the spread of **diseases**
- ✓ To **speed up** cleaning **operations**



JONIX for wellness and beauty



JONIX for wellness and beauty

Benefits:

- ✓ **Continuously** sanitises air and surfaces from viruses and bacteria
- ✓ It **dissolves** the chemicals accumulated in the environment
- ✓ **Reduces** electrostatic charges
- ✓ It **improves** the quality of the air and the well-being of staff and customers

Where:

- Hairdressing salons
- Beauty salons centers
- Nail salon
- Gyms
- Spa



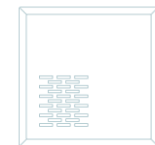
Cube Line



Steel Line



Mate Line



JONIX up IN

JONIX for Ho.re.ca.



JONIX for the **Ho.re.ca** sector

Benefits:

- ✓ **Sanitises** and deodorises the rooms
- ✓ **Decontaminates** the air and surfaces in entrances and common areas
- ✓ Makes reordering and cleaning operations more thorough and **efficient**
- ✓ It **guarantees** hygiene of the air and surfaces of small, highly frequented spaces such as lifts, bathrooms, changing rooms.

Where:

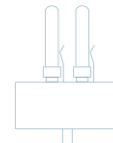
- Hotel
- B&B
- Farmhouses
- Restaurants
- Bar
- Professional kitchens
- Common spaces



Cube Line



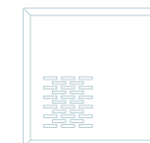
Steel Line



Inside Line



Mate Line



JONIX up IN



JONIX vmc 4people

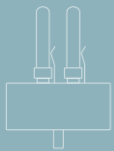


JONIX for the sector Ho.re.ca

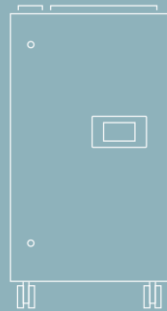
- ✓ Hotels



Cube Line



Inside Line



JONIX minimize

JONIX cube Line, JONIX inside Line

- ✓ To **sanitise** the air and surfaces
- ✓ To **protect employees** from airborne pathogens
- ✓ To **remove** all odours
- ✓ To **improve** comfort and well-being



JONIX minimize

- ✓ To **sanitise the rooms 24/7**
- ✓ To **avoid** the spread of any **disease**
- ✓ To **eliminate all odours**
- ✓ To **sanitise the entire room** during cleaning





JONIX for the **Ho.re.ca** sector

- ✓ Restaurants
- ✓ Bars



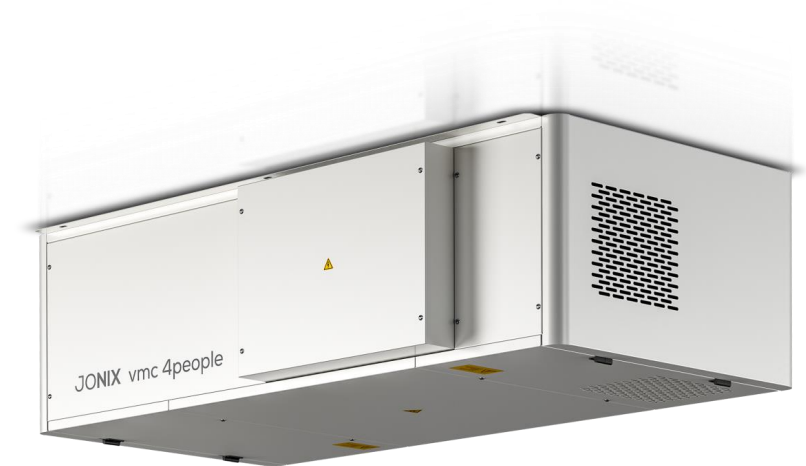
Steel Line



JONIX vmc 4people

JONIX Steel line and JONIX vmc 4people

- ✓ To **sanitise the air and all surfaces 24/7**
- ✓ To **eliminate** the proliferation of **bacteria**
- ✓ To **eliminate** organic **odours**
- ✓ To **eliminate** food odours
- ✓ To **prevent contamination**



JONIX for food



JONIX for the **food** sector

Benefits:

- ✓ **Continuously** sanitises air and surfaces
- ✓ **Decontaminates** and **deodorises** the production and storage areas
- ✓ It **guarantees** protection and safety in the spaces dedicated to resale
- ✓ Makes daily sanitisation operations more complete and **efficient**
- ✓ It **breaks down the pollutants** generated by preservatives, detergents, flow of people

Where:

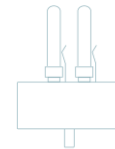
- Production chains
- Preparation chains
- Conservation supply chains
- Supermarkets
- Delicatessen
- Catering



Cube Line



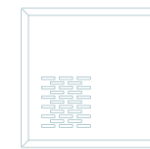
Steel Line



Inside Line



Mate Line



JONIX up IN



JONIX vmc 4people



JONIX for the **food** sector

- ✓ Food shops
- UP TO 2.000 m³ – (70629 ft³)



Steel Line

JONIX Steel line

- ✓ To **sanitise** the air and all surfaces **24/7**
- ✓ To **eliminate** the proliferation of **bacteria**
- ✓ To **eliminate** organic **odours**
- ✓ To **eliminate** **cooking odours**
- ✓ To **prevent** contaminating food





JONIX for the **food** sector

- ✓ Professional kitchens
- ✓ Catering
- UP TO 2.000 m3 - (70629 ft3)



Mate Line



Steel Line



JONIX vmc 4people

JONIX Mate line, JONIX Steel line and JONIX vmc 4people

- ✓ To **sanitise** the air and surfaces in the food **industries** and professional kitchens
- ✓ To **eliminate odours, moulds and bacteria**
- ✓ To **improve the preservation of products**
- ✓ To **reduce** direct, indirect and cross food **contamination**





JONIX for the **food** sector

- ✓ Food industry
- ✓ Catering
- MORE THAN 2,000 m³ - (70629 ft³)



Steel Line

JONIX Steel line

- ✓ To **sanitise the air** and all surfaces **24/7**
- ✓ To **avoid direct**, indirect and cross **contamination** of food
- ✓ To **eliminate** the proliferation of **bacteria**
- ✓ To **eliminate** all odours



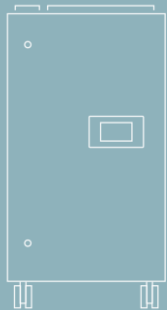


JONIX for the **food** sector

- ✓ Food industry
- ✓ Factories



Steel Line



JONIX minimize

JONIX steel and JONIX minimize

- ✓ To **sanitise** the air
- ✓ To **decontaminate** internal surfaces
- ✓ To eliminate **dust, bacteria, viruses and VOCs**
- ✓ To **prevent the spread of diseases**
- ✓ To improve respiratory functions



JONIX for business



JONIX for **business**

Advantages:

- ✓ It continuously **decontaminates** the air, surfaces and products on display
- ✓ **Eliminates contaminants** generated by people, furniture, devices and materials
- ✓ It **prevents** the spread of infections from airborne diseases
- ✓ It **improves** the quality of the air and the well-being of customers and employees

Where:

- Shops
- Offices
- Studios
- Meeting rooms
- Test booths
- Cash desk area
- Entrance



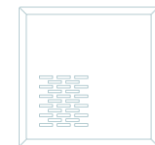
Cube Line



Steel Line



Mate Line



JONIX up IN

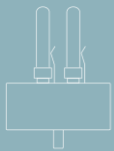


JONIX for **business**

✓ Offices



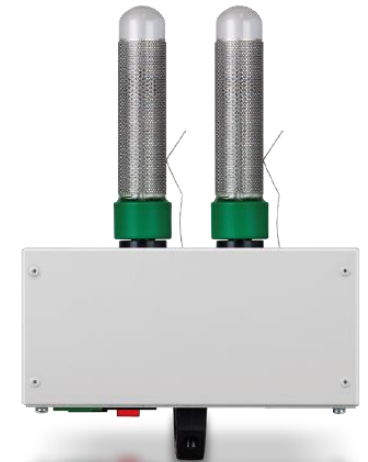
Cube Line



Inside Line

JONIX Cube line and JONIX inside Line

- ✓ To continuously **sanitise** the air and surfaces
- ✓ To **improve respiratory** functions
- ✓ **Reduce sick leave**





JONIX for business

- ✓ Shops



Cube Line



Steel Line



Mate Line

JONIX Cube line

- SHOPS UP TO 85 m³ – (3000 ft³)

- ✓ To **sanitise** the air and surfaces **24/7**
- ✓ To constantly **regenerate** the air



JONIX Mate line

- SHOPS UP TO 1.200 m³ – (42370 ft³)

- ✓ To **sanitise the air and all surfaces 24/7**
- ✓ To **sanitise all products** on sale



JONIX Steel line

- SHOPS UP TO 2.000 m³ – (70600 ft³)

- ✓ To **sanitise the air and all surfaces 24/7**
- ✓ To **eliminate** the proliferation of **bacteria**
- ✓ To **eliminate organic odours**





JONIX for **business**

- ✓ Waste collection warehouses



Steel Line

JONIX Steel Line

- ✓ To **sanitise** the air and all surfaces **24/7**
- ✓ To **eliminate** the proliferation of **bacteria**
- ✓ To **eliminate chemical odours**
- ✓ To eliminate **organic** odours



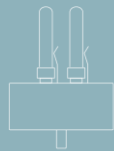


JONIX for **business**

- ✓ Large industries



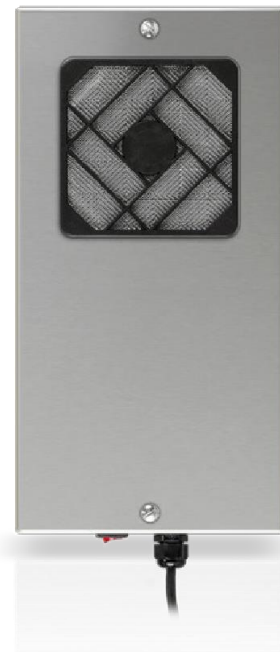
Steel Line



Inside Line

JONIX Steel line, JONIX Inside line

- ✓ To **sanitise the air and all surfaces 24/7**
- ✓ To **eliminate** the proliferation of **bacteria**
- ✓ To **eliminate** chemical **odours**
- ✓ To sanitise the **HVAC air duct**
- ✓ To **decontaminate internal surfaces**



JONIX for art



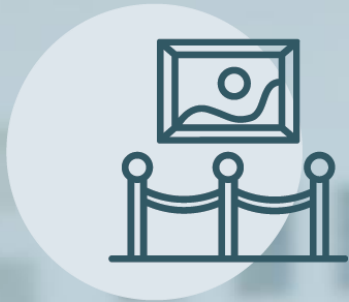
JONIX for art

Benefits:

- ✓ **Eliminates contaminants** generated by people, furniture, devices and materials
- ✓ **Non-stop decontamination** of air and surfaces
- ✓ **Sanitises** environments by filtering particles released from peoples' clothes when they walk

Where:

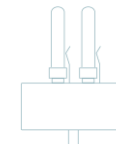
- Museums
- Art galleries
- Exhibition spaces of all sizes
- Cinemas
- Theatres



Cube Line



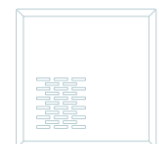
Steel Line



Inside Line



Mate Line



JONIX up IN

JONIX for residential



JONIX for the **residential**

Advantages:

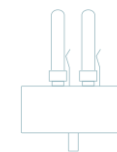
- ✓ **Eliminates** contaminants generated by furniture and building materials
- ✓ **Eliminates odours**
- ✓ It **improves** air quality and environmental comfort
- ✓ **Reduces** the formation of **mould**
- ✓ **Sanitises** the lift and common areas ensuring hygiene of the air and surfaces

Where:

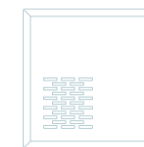
- Houses
- Apartments
- Home Office
- Condominiums
- Kitchens
- Bedrooms



Cube Line



Inside Line



JONIX up IN

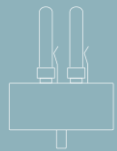


JONIX for the residential sector

- ✓ Private homes



Cube Line



Inside Line

JONIX Cube Line, JONIX Inside Line

- ✓ To **continuously sanitise** air and surfaces (24 hours a day)
- ✓ To **improve respiratory function**
- ✓ To **prevent** respiratory **infections** due to VOCs
- ✓ To **reduce** allergies
- ✓ To **remove** pathogens





JONIX for the residential sector

- ✓ Kitchens
- UP TO 85 m³ – (3000ft³)



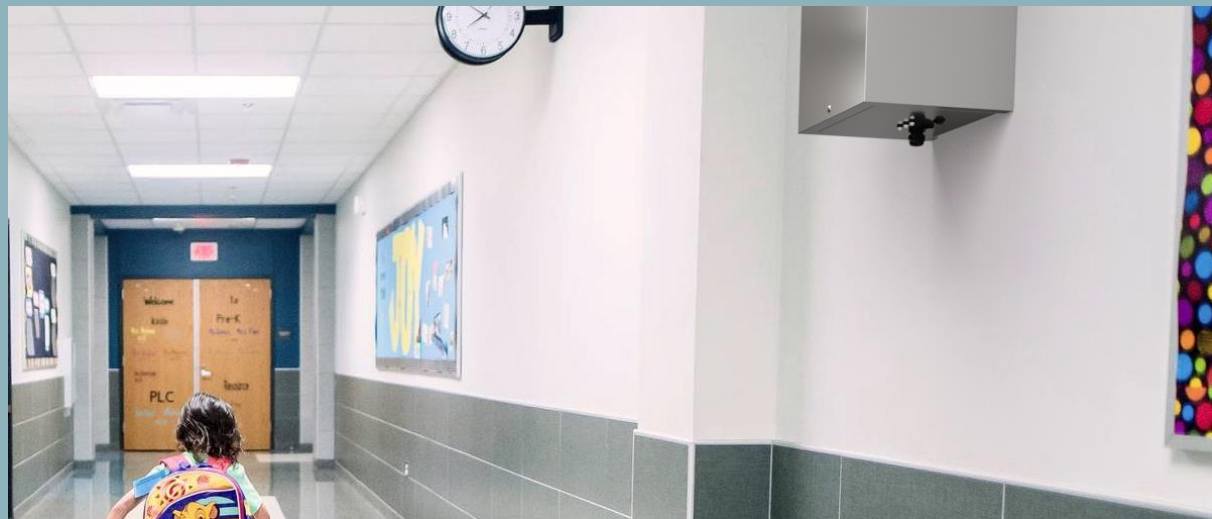
JONIX cube

JONIX Cube

- ✓ To **sanitise air** and **surfaces** (24/7)
- ✓ To **eliminate** the risk of **contamination** in food
- ✓ To **eliminate bacterial** contamination
- ✓ To **eliminate** food **odours**



JONIX for school



JONIX for the **school** sector

Advantages:

- ✓ **Eliminates contaminants**, bacteria and viruses carried by people, emitted by furniture, devices and materials
- ✓ **Prevents** contagion from airborne diseases
- ✓ It **improves** the **quality** of the air and the well-being of students and staff
- ✓ **Keeps people safe** and ensures the decontamination of books and equipment

Where:

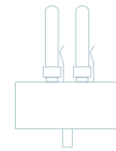
- Classrooms
- Common spaces
- Laboratories
- Canteens
- Gyms
- Rooms for after school



Cube Line



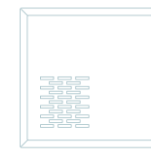
Steel Line



Inside Line



Mate Line



JONIX up IN



JONIX vmc 4people

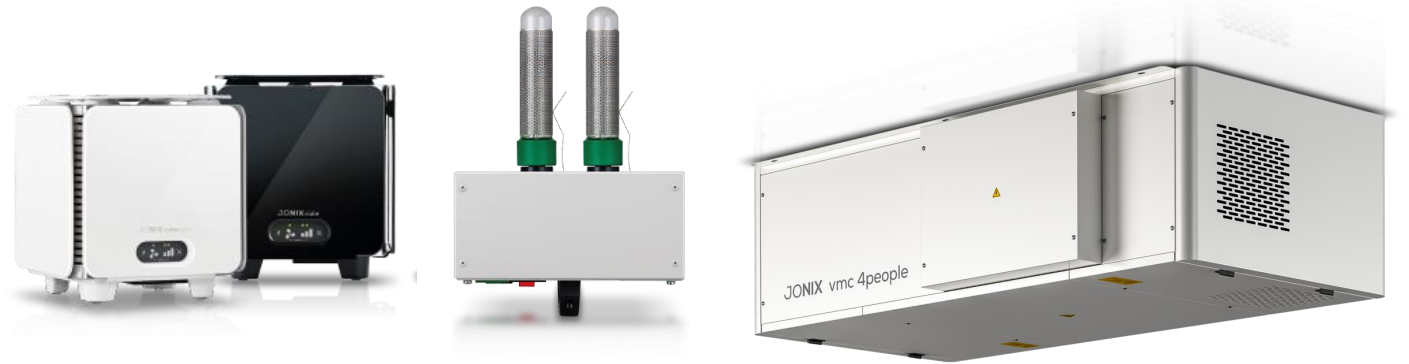


JONIX for the **school** sector

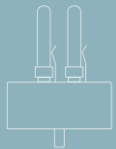
- ✓ Classrooms
- UP TO 85 m³ - (3000 ft³)

JONIX cube, JONIX Line inside and
JONIX vmc 4people

- ✓ To continuously **sanitise air and surfaces**
- ✓ **Reduce sick leave**
- ✓ **Improve** concentration
- ✓ Remove all **odours**



JONIX cube



Inside Line

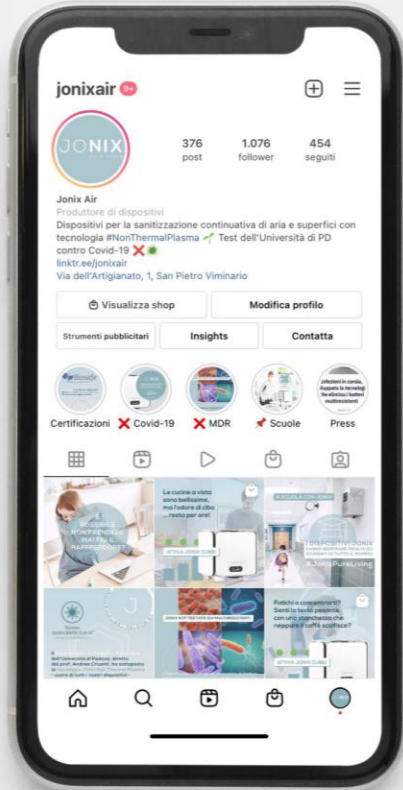
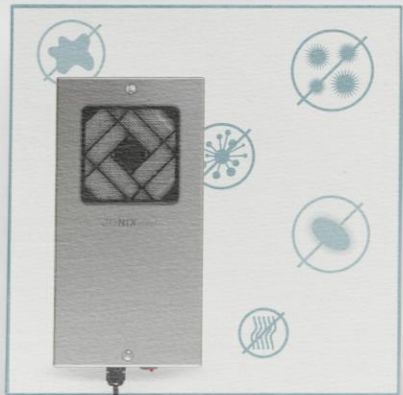
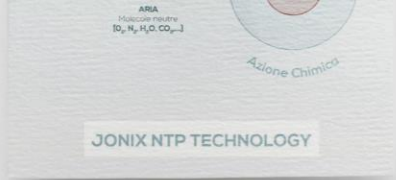


JONIX vmc 4people

JONIX

Communication





@jonixair



@jonixair



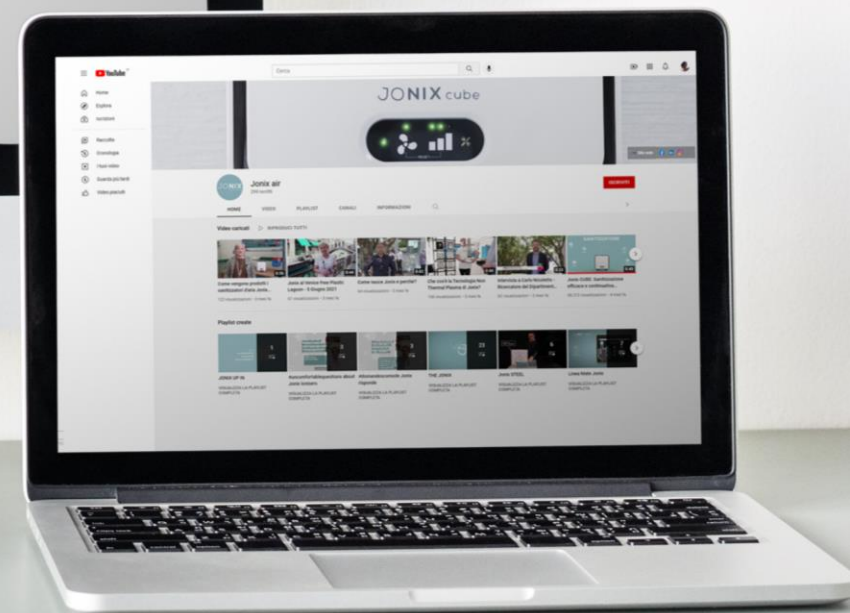
company/jonix



Jonix Air

JONIX blog

- News
- Technical articles
- Scientific articles
- Useful tips



JONIX

Case studies and scientific tests



Business



Medical



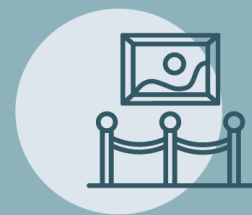
Test



Food



School



Art

Quantitative suspension test for the **evaluation** of **bactericidal activity** against **MDR bacteria**

The obtained results show that JONIX cube (NTP technology) device has an **effective bactericidal activity** against a known microorganism (*E.coli*) and 3 gram negative **multidrug resistant (MDR) microorganisms** (*Klebsiella pneumoniae*, *Acinetobacter baumannii* e *Pseudomonas aeruginosa*) with a **reduction of bacterial load up to 5 logarithmic units**.



Case Study
University
of Padova

Microorganism	Plate Forming Units / mL (initial)	Plate Forming Units / mL (treated)	Logarithmic reduction
<i>E. coli</i> ATCC 10536 12 h	4,55 x 10 ⁸	1,46 x 10 ⁶	6.2
<i>E. coli</i> ATCC 10536 14 h		1,45 x 10⁶	5.9
<i>E. coli</i> ATCC 10536 16 h		1,44 x 10 ⁶	6.2

Microorganism	Plate Forming Units / mL (initial)	Plate Forming Units / mL (treated)	Logarithmic reduction
<i>K. Pneumoniae</i> KPC 12 h	4,45 x 10 ⁸	1,61 x 10 ⁶	6.2
<i>K. Pneumoniae</i> KPC 14 h		1,38 x 10⁶	6.1
<i>K. Pneumoniae</i> KPC 16 h		1,83 x 10 ⁶	6.3

Microorganism	Plate Forming Units / mL (initial)	Plate Forming Units / mL (treated)	Logarithmic reduction
<i>A. baumannii</i> OXA-23 12 h	4,93 x 10 ⁸	3,93 x 10 ⁶	3.1
<i>A. baumannii</i> OXA-23 14 h		2,45 x 10⁶	4.1
<i>A. baumannii</i> OXA-23 16 h		2,56 x 10 ⁶	6.4

Microorganism	Plate Forming Units / mL (initial)	Plate Forming Units / mL (treated)	Logarithmic reduction
<i>P. Aeruginosa</i> OXA-48 12 h	2,59 x 10 ⁸	1,17 x 10 ⁶	4.1
<i>P. Aeruginosa</i> OXA-48 14 h		1,13 x 10⁶	4.8
<i>P. Aeruginosa</i> OXA-48 16 h		1,15 x 10 ⁶	6.1

Effects of treatment with JONIX cube. The bacterial load reduction values are expressed in terms of logarithmic units.



Quantitative suspension test for the **evaluation** of **bactericidal** activity against **MDR bacteria**

BACTERICIDAL EFFICACY TEST REPORT

Quantitative suspension test for the evaluation of bactericidal activity against MDR bacteria

PRODUCT:

JONIX CUBE
an air purification device

CLIENT

Jonix S.r.l. Address: Viale Spagna, 31/33 - 35020 Tribano (PD)
VAT number and TAX CODE 04754080283

SCIENTIFIC MANAGER

Prof. Andrea Crisanti

Collaborators: Dr. Claudia Del Vecchio, Dr. Manuela Sciro and Dr. Giuseppe Di Pietra

Report Date: 28/05/2021

Quantitative test in suspension for the evaluation of **virucidal activity** against the **SARS-CoV-2 virus**

There was the desire to evaluate the **virucidal activity**, particularly on **SARS-CoV-2** strain virus, by means of a device (JONIX cube) using **Non-Thermal Plasma** technology by emitting oxidizing species.

Exposition time (minutes)	Control		Treated		Reduction	
	PFU/ml	log _(PFU/ml)	PFU/ml	log _(PFU/ml)	U _{logarithmic}	%
0	10.000.000	7	10.000.000	7	0	0
30	10.000.000	7	1,07	0,03	6,97	99,99999
60	10.000.000	7	1,02	0,01	6,99	99,99999
120	10.000.000	7	1,02	0,01	6,99	99,99999
240	10.000.000	7	1,02	0,01	6,99	99,99999

Effects of treatment with JONIX cube. The viral load reduction values are expressed both in terms of logarithmic units and in percentage. Plate Forming Units (PFU), is the number of infecting viral particles per mL.

The obtained results show that the Jonix Cube device (NTP Technology) has an **effective antiviral activity against SARS-CoV-2** with a **reduction of the viral load equal to 99.99999%** (about 7 logarithmic units) after only **30 minutes** of exposure.





Tested
against **SARS-CoV-2**
University of Padua

Quantitative test in suspension for the evaluation of **virucidal activity** against the **SARS-CoV-2** virus

VIRUCIDAL EFFECTIVENESS REPORT

Quantitative test in suspension for the evaluation of virucidal activity
against the SARS-CoV-2 virus

PRODUCT:

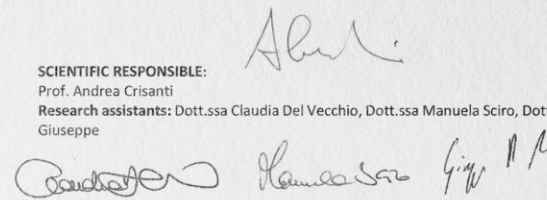
JONIX CUBE
air purification device

CLIENT

Jonix S.r.l., Address: Viale Spagna, 31/33 - 35020 Tribano (PD)
VAT and Tax Code 04754080283

SCIENTIFIC RESPONSIBLE:
Prof. Andrea Crisanti

Research assistants: Dott.ssa Claudia Del Vecchio, Dott.ssa Manuela Sciro, Dott. Di Pietra
Giuseppe



Report Date: 22/09/2020

Impact of JONIX MATE (air treatment system using NTP technology) on hospital operating rooms

RESULT - Average decrease of airborne Total Bacterial Load: 87.5%

To reduce the risk of healthcare – associated infections it was used a JONIX mate cabinet device (NTP Technology + filters) alongside standard and ordinary environmental decontamination activities inside two private clinic's operating rooms.

Target **analyses** were carried out **at the end of the day** (worst conditions) and **after the nocturnal treatment** using JONIX mate device (best conditions).

Data collected showed a **microbial contamination level** (total bacterial load, moulds and yeasts, coagulase-positive staphylococci) that was **substantially low both on work surface and ambient air**.



JONIX mate sanitizing and filtering cabinets placed in two hospital's operating rooms in Calabria where the test was carried out



Case Study
Calabria
hospital (IT)

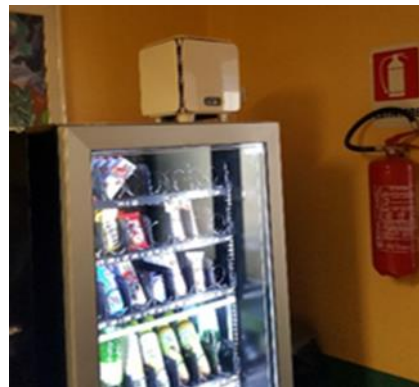
Impact of JONIX cube (air treatment system using NTP technology) on hospital wards

RESULT - Average decrease of airborne Total Bacterial Load: 86%

To reduce the risk of healthcare – associated infections three JONIX cube devices (NTP Technology) were used alongside standard and ordinary environmental decontamination activities inside an hospital ward. Particular attention was paid regarding surfaces that often comes in contact with hand of visitors, patients and medical staff, i.e. the coffee machine's keypad and the handrail.

The results obtained by the **analyses of surfaces and ambient air** were **compared with** samples of a **control ward** without the NTP device.

Data collected evidenced a **microbial contamination level** (total bacterial load, moulds and yeasts, coagulase-positive staphylococci) that was **substantially low both on surfaces and ambient air**.



Three JONIX cube devices with NTP technology placed in hospital wards in Lombardia where the test was carried out.



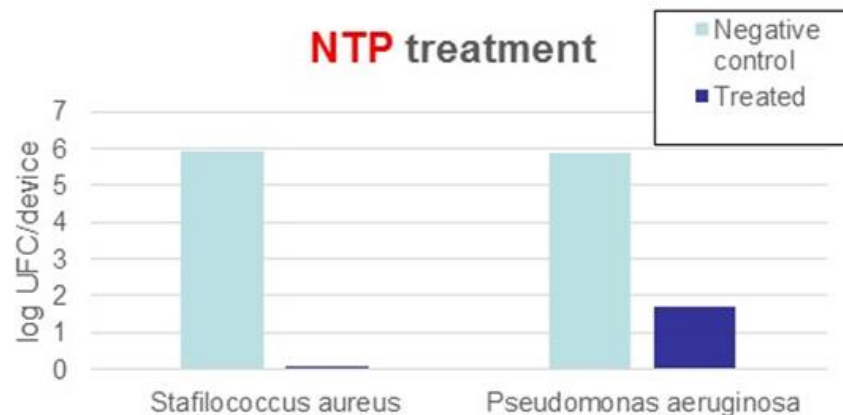
Case Study
Lombardia
hospital (IT)

Sanitization of non-critical ultrasound probes with Non Thermal Plasma (NTP) technology

RESULT – Reduction of total bacterial load comparable to that of the devices commonly found in the market for the purpose

Tests of sanitation were carried out on “**non-critical**” **ultrasound probes** by using NTP air, and the results concerning the **reduction of microbial species** were **compared** to the sanitization effect using **usual commercial devices** (ANTIGERMIX).

The tests have shown an **efficiency of NTP** that is **comparable to that of the devices commonly found in the market** for the purpose.



Case Study
Tuscany's
hospital (IT)

Study of air sanitation in a veterinary clinic with JONIX steel (NTP technology)

RESULT – Reduction of bacterial load and odors

The goal was to achieve a **reduction in perceived odors and a reduction in airborne microbial contamination** in a veterinary clinic's rooms where concentrations could be significant and have a negative impact on animals and people.

It was decided to carry out the measurements in two environments: the waiting room at the entrance and the animal hospital room. Samples were collected before the installation of JONIX steel devices and after its action.

The results have shown a **reduction of bacterial concentration** over time, the prolonged supply of ionizing molecules to the air makes it inhospitable for contaminants.

Also, **the deodorization effect of the air was sensorially appreciable** in both rooms: the odor present was significantly reduced.



Waiting room (left) and animal hospital room (right) of the veterinary clinic in Veneto where JONIX steel devices were placed and where the test was carried out



Case Study
Veneto's
**veterinary
clinic (IT)**

Reduction of odor impacts on waste management plant (BA-TEST pilot-industrial SCALE)

RESULT – Reduction of concentration of odorous substances up to 30%

A study on a **pilot-scale waste management plant** was carried out to test the effectiveness of NTP technology to **effectively reduce the odor load** present.

Different kind of waste was used, each with a strong concentration of organic volatile compounds.

The results obtained highlight that NTP technology has a **positive effect on the abatement of the species present in the gaseous flow generated by waste**, with percentages ranging between 25% and 40%.

The organic molecules are reduced up to about 40% and the odorous substances decrease in their concentration up to 30%.



LEGEND:

- A. Emission aspiration
- B. By-pass selector
- C. NTP® Generator
- D. Emission output
- E. Sampling points: (1 on top, upstream of the abatement system; 2: at the bottom, downstream of the treatment; 3 downstream of the treatment system, before the final emission)



Case study
pilot-
laboratory
**waste
management
plant**

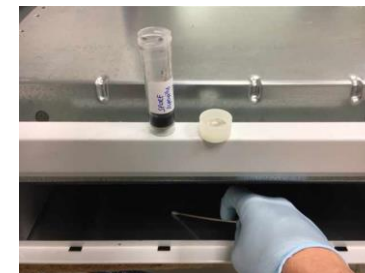
Study of the **sanitization power** of a JONIX device applied to a commercial fan coil

RESULT – Low concentration of airborne microorganism and preventing contamination of internal fan coil’s components

A JONIX inside device was installed in a wall-mounted **fan coil** unit to test its sanitization effectiveness at biological level. In particular, the analysis focused on the device’s potential to **eliminate moulds** that often pollute certain parts of the equipment and to **sanitize the air of the room** in which it’s installed.

Different parts of two fan coils, one with the JONIX device installed and one without the NTP device, were **contaminated with mould spores**, and **samples** of ambient air and surfaces were **collected after a week** of fan coils’ use.

Based on the observations made during the analysis of the samples, it is possible to state that the adoption of a JONIX inside in a fan coil device may provide the double advantage of **maintaining the quantity of airborne microorganisms at low levels** and of **preventing the fan coil from being contaminated** by undesirable microorganisms, especially moulds.



Details of contamination phase with mould spores on fan coils



Case study
commercial
fan coil

Use of NTP technology **against odors** associated with the **use of footwear**

RESULT – Reduction of chemical molecules and microorganisms responsible of bad odours

The effectiveness of NTP air was tested as for the abatement of **chemical molecules** and for the **microbiological sanitization** to eliminate bad odors that are associated with use of footwear.

In particular, NTP air resulted effective in eliminating the following species:

- ✓ **Chemical molecules** responsible for odors.
- ✓ **Microorganisms** responsible for producing odors.

Regarding the elimination of chemical molecules, the experiment led to the conclusion that the **air treatment using NTP for sufficiently long timeframes** (from 6 hours onwards), is **EFFECTIVE** to **eliminate** and destroy completely the **molecules in object**, as shown in the table.

Chemical molecules	Elimination % of molecules compared to the initial concentration, via NTP air		
	60 min	6 h	17 h
Acetic acid	69%	100%	100%
Propionic acid	45%	100%	100%
Isobutyric acid	31%	100%	100%
Butyric acid	21%	100%	100%
Isovaleric acid	0%	100%	100%
Valeric Acid	10%	100%	100%
Caproic Acid	6%	100%	100%
Caprylic Acid	6%	99%	99%
Caprylic Acid	6%	88%	95%



Case study
footwear

Laboratory study on the biocidal activity of oxidizing species generated via **NTP**

RESULT – Non Thermal Plasma has an effective biocidal activity

The purpose of this study was to attest the **biocidal activity** of NTP technology **on different microbial strains typical of a supermarket's environment**.

From the results it is evident that even **with short contact times (5 minutes)**, the biocidal activity of NTP air is total: the **plates exposed to NTP air show no development of microbial strains** tested, which, instead, are normally developed on plates just exposed to air.

Salmonella Spp.

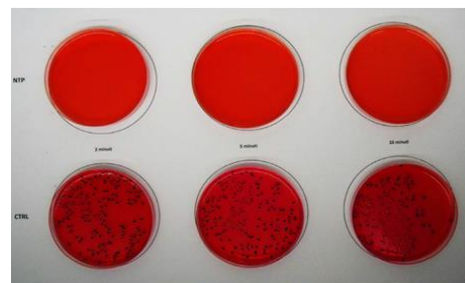


Foto 1 - Attività su Salmonella spp.

Pseudomonas aeruginosa

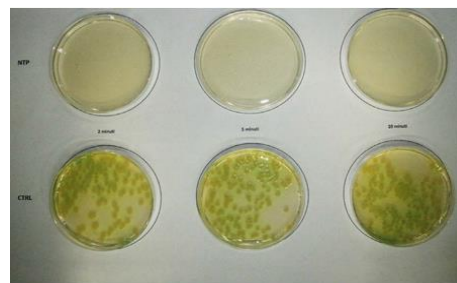


Foto 5 - Attività su Pseudomonas aeruginosa

Staphylococcus aureus

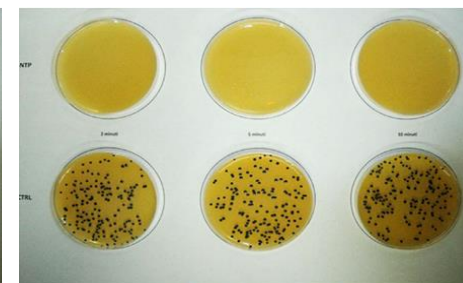


Foto 4 - Attività su Staphylococcus aureus

Escherichia Coli

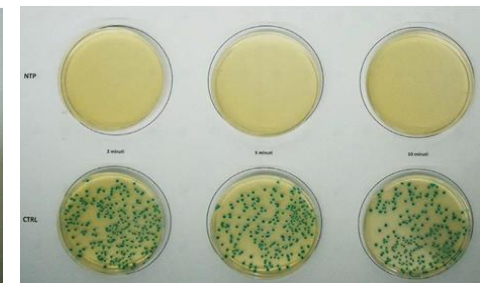


Foto 2 - Attività su Escherichia coli

Listeria monocytogenes

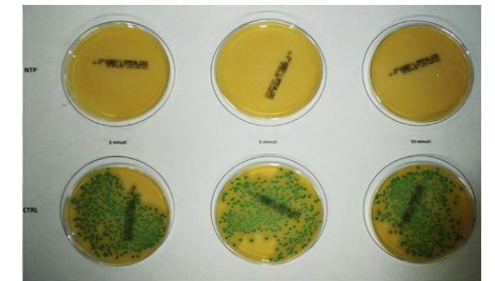


Foto 1 - Attività su Listeria monocytogenes



Case study
Supermarket
specific
microorganisms

Sanitizing effects of the JONIX minimate device in the large-scale food distribution sector

RESULT – Substantial reduction of bacterial contaminations

A JONIX minimate device was installed in a hypermarket in the packaging area of the meat processing department to evaluate its ability to improve ambient air quality.

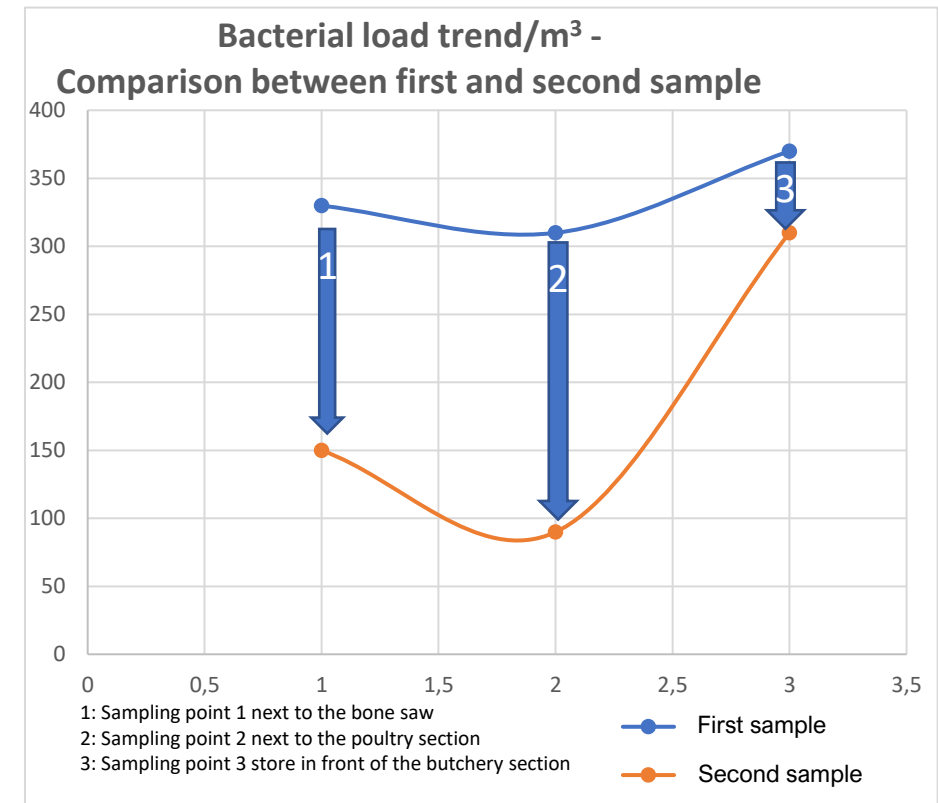
Samples were collected after installation and action of the device, in order to **assess the level of bacterial concentration in air**. Between first and second sample the power level of the device was increased.

Knowing that the total bacterial concentration values in supermarket environments can vary from 500 to 1000 colony-forming units per m³ (depending on the crowd, the season and the maintenance status of the air treatment system), **the bacterial concentration per cubic meter is lower than the average reference values.**

It is therefore evident that the JONIX minimate device has **significantly reduced the contamination in the air, despite the influence of the air coming from the open side facing the store and the ceiling air system (not filtered).**



Case study
meat
processing
room in
hypermarket



JONIX References



Business



Medical



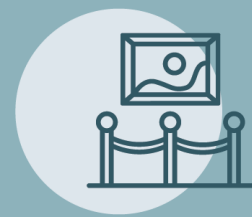
Test



Food



School



Art

Improve ambient air quality in manufacturing and storage rooms with **Non Thermal Plasma** technology

RESULT – Improvement of air quality in storage rooms and in clean rooms

Ambient air quality is very important in a **food company** where **raw products are processed**.

Around 30 JONIX minimate were installed in a **food company in Spain**, specifically in **rooms where raw materials are stored** before preparation, and in **clean rooms where food is prepared** and packaged, resulting in an improvement of ambient air in these environments.



Left: Building of the Spain food company
Right: type of food products the company produces.



Reference
Spain
**food
company**

Effects of Non Thermal Plasma (**NTP**) technology in a care home in Noventa Padovana

RESULT – Reduction of staff’s absence due to illness, reduction of bacterial concentration and odours

In a care home in Noventa Padovana (Pd) there was the desire to create a **better environment** for the elderly, staff and visitors.

After the installation of various Jonix devices (first 2 JONIX steel IC devices, 2 JONIX cube devices, 1 JONIX minimate device, then additional 4 JONIX cube devices after one year) a **reduction of staff’s absence due to illness was registered.**

Furthermore, the use of a stand alone JONIX minimate allowed to **carry on group activities**, useful to the elderly’s wellness.



Casa di Riposo di Noventa Padovana

Care home and day care center for non-self sufficient elderly people in Noventa Padovana, Padua.



Reference
Care home
in Veneto

Effects of Non-Thermal Plasma (NTP) technology in the nursing home in Caltanissetta

RESULT - Reduction of bacterial concentration and odours, better overall environmental comfort

The managers of the **Nonni Felici 4.0 retirement home in Caltanissetta** have always been attentive to the well-being of the body, mind and heart of their guests and are constantly committed to making their guests feel "at home".

For this reason, an important goal was to maintain a healthy environment in all rooms of the building, where **JONIX devices were installed in every room and in the common areas.**

The staff, guests and family members of the guests are very satisfied with the **better air quality and the increase in environmental comfort.**

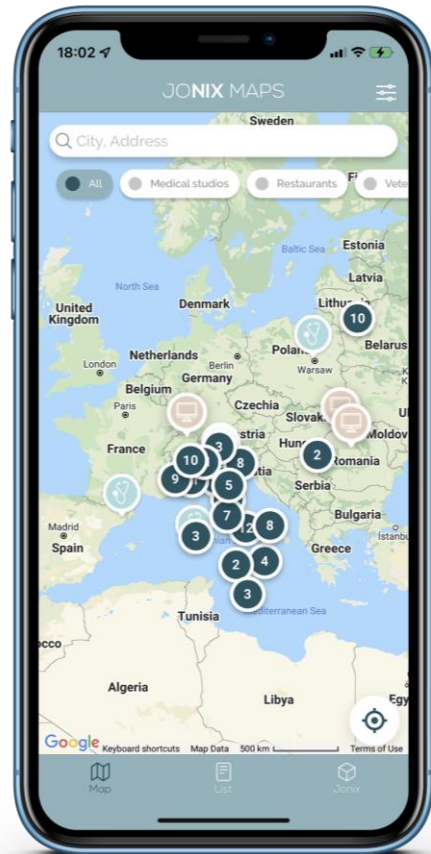


Reference
**Retirement
home**
in Sicily

JONIX devices installed in **medical centers**



References
**Medical
centers**
in Italy



Medical center	City
Cardiological center	Salerno (Campania)
Medical company	Liguria
Medical implants manufacturer	Padova (Veneto)
General medicine center	Genova (Liguria)
Cardiological center	Pagani (Campania)
Nursing center	Tregnano (Veneto)
Pharmacy cooperative	Bolzano Vicentino (Veneto)
Veterinary medicine devices	Cherasco (Piemonte)

Air sanitisation in an Italian's medical devices manufacturer

RESULT – Air quality and employees wellness improvement

An Italian manufacturer and supplier of **high quality medical devices for respiratory support** was concerned of the air quality in its office's rooms. As a result of the installation of 24 JONIX cube devices and 3 JONIX steel 2C devices, the **quality of the air increased as well as general wellness** of the employees.



Examples of devices produced by the medical devices for respiratory support manufacturing company.

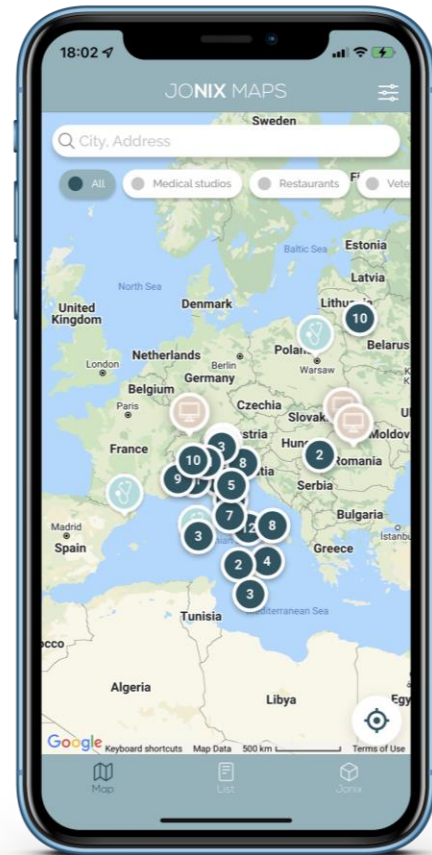


Reference
Manufacturing
company

JONIX devices installed in Italian **businesses**



References
Businesses
in Italy

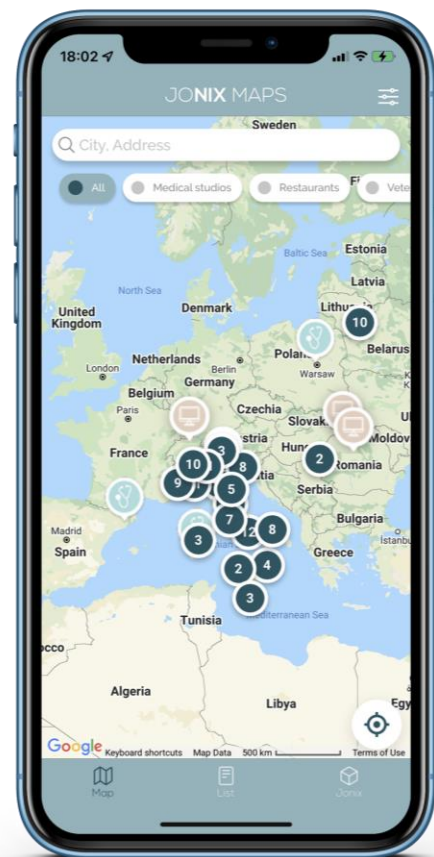


Business	City
Legal advice office	Padova (Veneto)
Cosmetic retailer	Mantova (Lombardia)
Cleaning service	Padova (Veneto)
Houseware	Padova (Veneto)
Cosmetic industry	Treviso (Veneto)
Plastic industry automation	Padova (Veneto)
Hairstyle saloons	Verona (Veneto)
German partner	Germania

JONIX devices installed in **public buildings**



References
**Public
buildings**
in Italy



Public buildings	City
Local administration	Agna (Veneto)
Local administration	Arona (Piemonte)
Local administration	Arzergrande (Veneto)
Carabinieri headquarters	Udine (Friuli)
Exhibition space	Padova (Veneto)
Local administration	Capaccio Paestum (Campania)
Ministry of Economy and Finance	Genova (Liguria)
Postal service	Many offices on italian territory
Ministry of Public Health	Many offices on italian territory

Use of NTP technology for the safety of visitors and works of art

RESULT - Optimal conditions for works of art

In **Palazzo Zabarella**, the heart of Paduan art, devices with **NTP technology** have been installed with the aim of allowing visitors to experience beauty in a protected environment and guaranteeing the works of art the **optimal conditions** for their conservation.

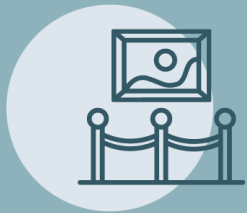
6 **JONIX** cube were installed throughout the exhibition area, positioned near the paintings to **protect** the works from **potentially harmful** pollutants and create an environment free of viruses, bacteria and odours for visitors.

A **JONIX** mate was installed in the first floor room which guarantees, even in situations of **high visitor numbers**, the **necessary sanitisation of the air volume and surfaces**.

JONIX inside were then installed in the fan coils of the structure to continuously **sanitise the critical parts of the pieces of furniture**



JONIX devices installed in a museum on the left audioguide sanitisation system, on the right JONIX cube



Reference
Museum
in Italy



Reference
Schools
in Puglia

Use of NTP technology for safety in school buildings

RESULT - Reduction of bacterial concentration and odours

The "**San Giovanni Bosco**" **Comprehensive Institute of Manfredonia** has invested in indoor air quality and purchased 43 JONIX cube which it then placed in the classrooms and **common areas** of the school complex which holds **850 pupils**, distributed in three complexes.

The director of the Institute chose JONIX to ensure **safety in school spaces** for students and collaborators because, now more than ever, the quality of the air we breathe indoors is important.



Reference
Schools
in Campania

Use of NTP technology for safety in school buildings

RESULT - Reduction of bacterial concentration and odours

The **comprehensive "Maiuri" Institute of Pompeii** invested in indoor air quality and purchased 30 JONIX up IN which it then placed in the **classrooms** and **common areas** of the school complex.

The director of the Institute chose JONIX to ensure **safety in school spaces** for **students** and **collaborators**, where the narrowness of the classrooms and social distancing are elements that impact on safety.



Reference
Schools
in Lazio

Use of NTP technology for safety in school buildings

RESULT - Reduction of bacterial concentration and odours

The comprehensive "8th CPIA" Institute of Frosinone invested in indoor air quality and purchased 7 JONIX cube which it placed in the classrooms of the school complex.

The director of the Institute chose JONIX to ensure **safety in school spaces** for students and collaborators, where the narrowness of the classrooms and social distancing are elements that impact on safety.

Use of NTP technology for safety in school buildings

RESULT - Reduction of bacterial concentration and odours

The "**Anna Frank**" State Comprehensive Institute of Montecalvo In Foglia invested in indoor air quality and purchased 23 JONIX vmc 4people that were placed in the classrooms of the school complex.

The headmaster of the Institute has chosen JONIX to guarantee **safety in the school** for around 400 students and collaborators, even in the most confined rooms where it is difficult to maintain distance, such as classrooms.



JONIX vmc 4people devices placed in classrooms at the "Anna Frank" State Comprehensive Institute of Montecalvo In Foglia.

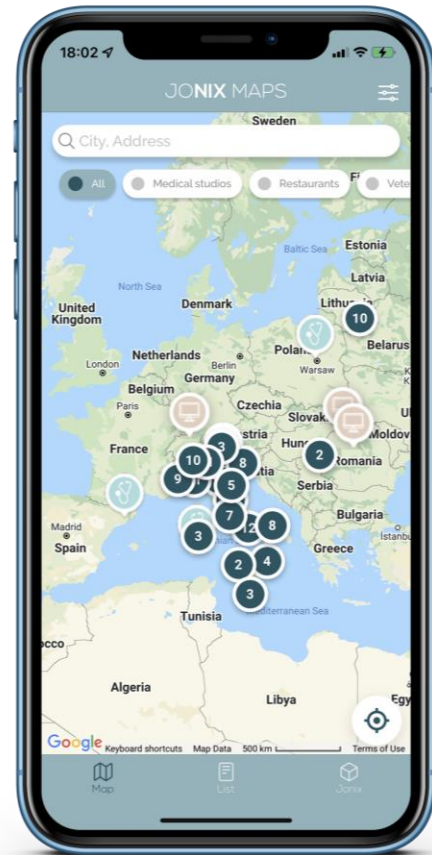


Reference
Schools
in Marche

JONIX devices installed in **school buildings**



References
Schools
in Italy



School	City
Secondary school	Treviso (Veneto)
Nursery school	Legnago (Veneto)
Secondary school	Camaiore (Toscana)
Nursery school	Lazise (Veneto)
Secondary school	Salerno (Campania)
Secondary school	Isernia (Basilicata)
Secondary school	Massa Marittima (Toscana)
Secondary school	Bari (Puglia)
K-14 school	Este (Padova)
K-14 school	Capezzano Pianore (Toscana)
Secondary school	Roma (Lazio)
Secondary school	Faenza

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Non Thermal Plasma

by JONIX

Non-Thermal Plasma, or Cold Plasma, is a type of **plasma generated at room temperature**, and therefore **can be used in biological systems**. Plasma, considered the fourth stage of matter, differs from solid, liquid and gas, it is a gas ionized through an evolved form of ionization, in which, **due to an energy discharge, a large number of electrons have been stripped from the respective atoms**. JONIX technology, **generates the plasma with micro electric discharges** with a dielectric barrier produced by a patented power supply system. The generator is the shape and function as a light bulb, screwed at the base to a transformer that supplies it with energy.

In this type of generator, there are **two electrodes**, they are mesh metal **divided by a layer of glass** which is the dielectric material (insulator). **The energy generated** by an electric discharge that reaches the electrodes **activates the air molecules which release electrons**. These electrons in turn **hit other molecules that are activated and free other electrons**, thus starting a **chain reaction that leads to the formation of the plasma**, inside which there are ions and free radicals with a short half-life but with high oxidizing power.

In the area near the plasma, thanks to the direct action of the discharge around the generator on the molecules, **the first oxidizing species are formed**, such as $\cdot\text{OH}$, $\cdot\text{NO}$, H_2O_2 , O , 1O_2 , O_3 . The density of these species is very high in the first 4-5 mm (0.15-0.19 inches) from the external mesh metal. As new activated molecules are formed, they spread away from the generator at lower concentrations. Meanwhile, due to chain reactions between the first activated molecules, with each other and with the molecules found in the surrounding atmosphere, **secondary active molecules** are also formed, such as $\cdot\text{OH}$ and $\cdot\text{NO}_2$ from HNO_3 , HNO_2 and HNO_3 from $\cdot\text{NO}$ and $\cdot\text{NO}_2$.

Molecules with strong oxidizing power act on various compounds and inactivate or destroy them. For example, **volatile organic compounds** that react with oxidizing molecules and in turn oxidize in various steps until the formation of simple compounds that have lost their initial characteristics.

If the volatile organic compounds come into contact with the plasma on the dielectric they will be oxidized very effectively. **To facilitate the contact of volatile organic compounds with the plasma, airflow is generated by a fan that passes over the generator**. The oxidising species that live longer are removed from the generator and thanks to this air current spread and retain oxidizing power even far from the source. For this, the generator must be active continuously or with short cycles to allow the continuous generation and diffusion in the air of the oxidizing species.

Another example is **microorganisms** (bacteria, moulds, yeasts, viruses): oxidizing molecules react with the phospholipids and proteins of the cell membrane of microorganisms and destroy them, opening a passage for the oxidants to enter the cell. Here the molecules oxidize the proteins and nucleic acids of the DNA, breaking it into small fragments and rendering it unusable. This then quickly eliminates the cell.

