



**COMEX  
GROUP**  
TUTTO UN ALTRO CLIMA



Contributing to reducing  
the greenhouse effect



**ACTIVE  
SANITISATION**



# FREEZAIR

THE ADIABATIC COOLER

# ABOUT US ...technological innovation since 1986



## OUR MISSION

Founded in 1986 as a manufacturer of industrial furnaces, **Comex Group** has built its history on a fundamental value: technological innovation.

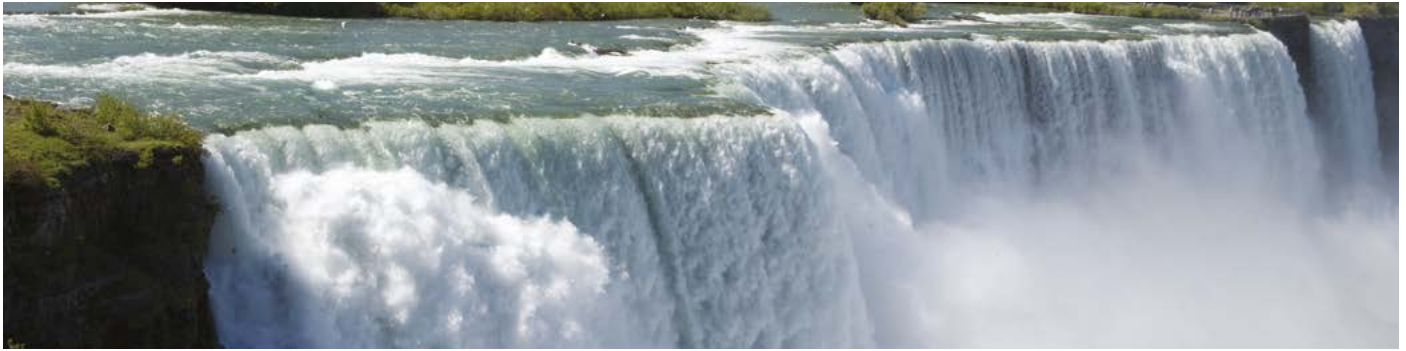
Many years of experience in the heating and air-conditioning sectors, combined with the continuous acquisition of know-how on new technologies and applications, have enabled the company to apply solutions that are always up-to-date using heat pump systems, solar cooling, heat recovery, thermal power stations and, most recently, air sanitation.

Research and innovation have distinguished the company in the heating and air conditioning sector with important advantages for **Comex Group** customers in the areas of energy saving, safety and environmental protection.

**Comex Group S.r.l. LOREGGIA (PD) Via Europa Unita, 19 Tel. +39 049 9302774**  
**[www.comexgroup.it](http://www.comexgroup.it) - [info@comexgroup.it](mailto:info@comexgroup.it)**

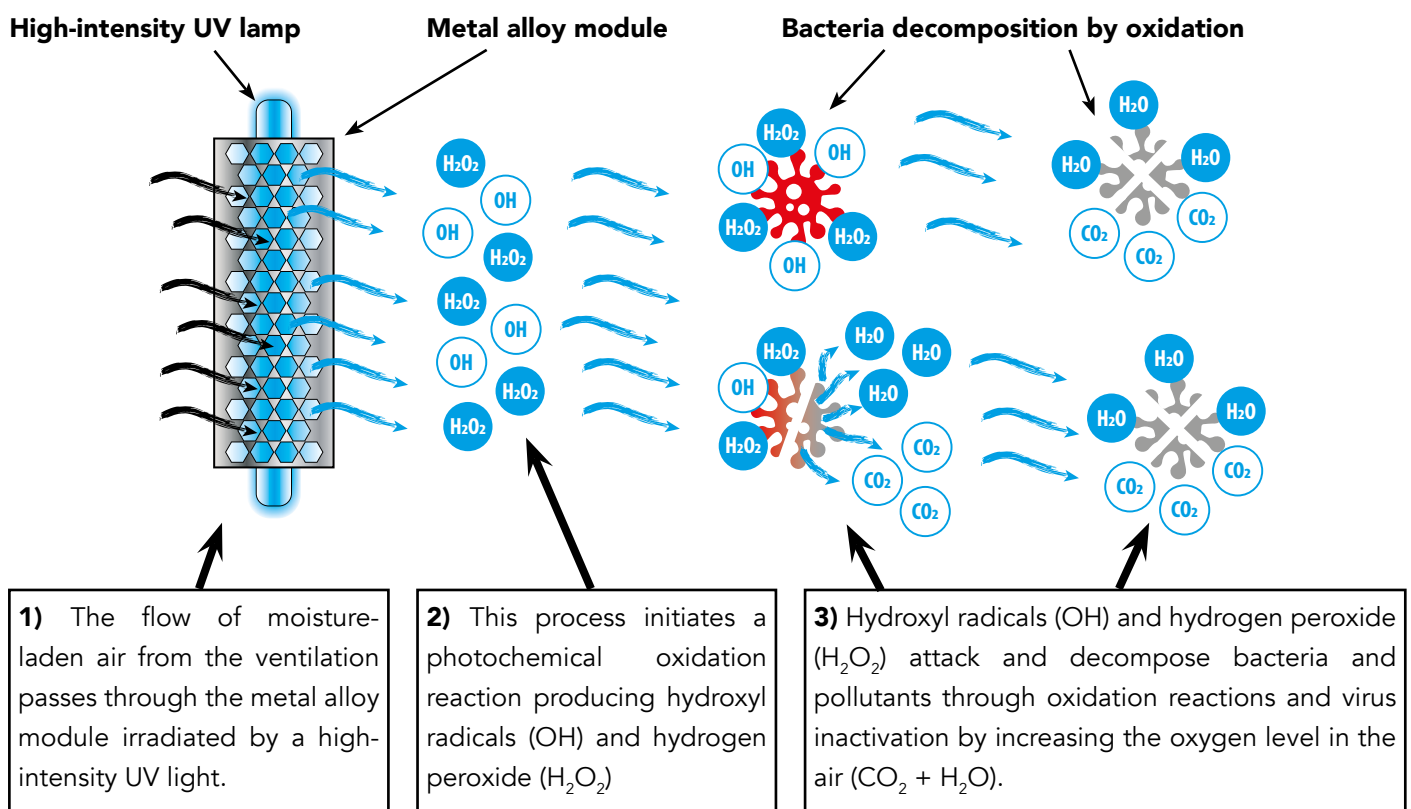
The data in this brochure should be regarded as indicative and not binding.  
The Comex Group reserves the right to change them without prior notice.

# FREEZAIR SANIFRESH - cools and sanitises the air



The new version of **FREEZAIR SANIFRESH** activates a room sanitisation process based on an innovative technology, 'ionising heterogeneous photocatalysis' also known as RCI (Ionising Catalytic Radiation). Before being released into the environment, the air passes through the sanitising chamber of the **FREEZAIR SANIFRESH** unit and, thanks to a special UV lamp, photochemical reactions are triggered by a suitable light-sensitive catalyst that acts directly on an appropriate composite material.

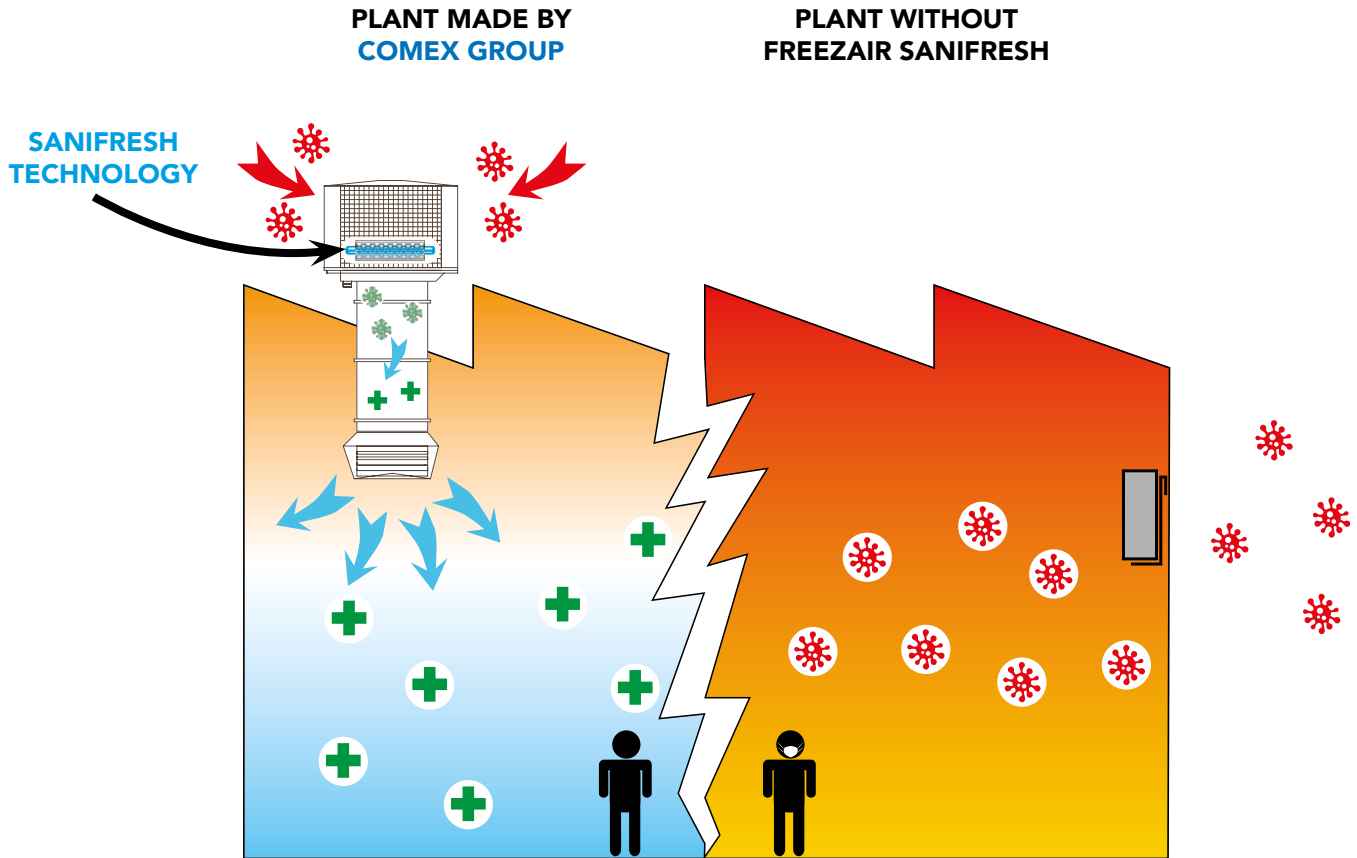
## Sanitisation cycle



**By diffusing hydroxyl radicals (OH) and hydrogen peroxide ( $H_2O_2$ ) into the environment, these are also deposited by gravity, allowing safe, effective and complete sanitisation of the surfaces of ducts, air, the surfaces of treated rooms and any textiles and objects inside the rooms using FREEZAIR SANIFRESH.**

# SANIFRESH TECHNOLOGY

Thanks to the RCI (Radiant Catalytic Ionisation) technology built into the entire FREEZAIR SANIFRESH product range, it is possible to achieve continuous active sanitisation for the production of hydrogen peroxide (H<sub>2</sub>O<sub>2</sub>), the process that actively disinfects the ambient air by reducing the concentration of pollutant particles, pathogenic microorganisms and airborne allergens.



## PRINCIPLE OF COOLING

People in the summertime seek the best comfort at the lowest operating cost, and our company has taken this message on board by using the resources of nature, air and water, in combination.

We know the feeling of comfort to be on the beach, by the sea on a hot sunny day or in the mountains in the sun in front of a waterfall.

This comfort is due to the exchange of heat contained in the air, which, through natural evaporation, gives up a large part of the heat to the water, producing the natural cool-wellness effect, like being at the sea or in the mountains.

## WORKING PRINCIPLES

The FREEZAIR evaporative cooler technology reproduces natural air-water heat exchange by means of a pump that bathes honeycomb parcels sprayed with water past air.

It is a product of simple conception:

- External supporting structure
- Tank components,
- Pump,
- Honeycomb packs,
- Float,
- Fan,
- Water inlet valve, Water outlet
- Electrical circuit.



The active RCI (Radiant Catalytic Ionisation) sanitisation process already integrated in all FREEZAIR SANIFRESH units offers a reduction of antibiotic-resistant Staphylococci.

# FREEZAIR - the adiabatic cooler



## PRODUCT RANGE

A wide range of FREEZAIR models is able to meet the different requirements of use in small and large environments at different sizes.

## USE

It is suitable for use in industries, bookbinding foundries, farms, logistics, printing works, etc.

## ADVANTAGES

- **Lowering of ambient air temperature**
- **Recirculation of stale air**
- **Improves people's well-being**
- **Low noise level**
- **Environmentally friendly with zero emissions, uses only water and no refrigerant gas**
- **Low system cost**
- **Low electricity consumption**
- **Low maintenance costs**

## PLANT AND APPLICATIONS

The calculation for the sizing of the system and the number of FREEZAIR units that can be installed depends on the type of activity, and the internal thermal load usually present in the production cycle.

The most common applications of the coolers are fixed wall or ceiling installation positioned outside the rooms.

The fresh air produced by the cooler is then channelled towards terminals with adjustable fins that distribute it inside the rooms to be cooled.

The only connections required for operation are electrical and hydraulic.

Thanks to the command and control panels, it is possible to set the appropriate room temperature as well as programmable on/off switching via a timer.

## LOWERING THE TEMPERATURE THANKS TO FREEZAIR

Temperature	Relative humidity %					
°C	10 %	20 %	30 %	40 %	50 %	60 %
20 °C	9,8 °C	11,2 °C	12,7 °C	13,7 °C	15,1 °C	16,1 °C
25 °C	13,1 °C	14,8 °C	16,2 °C	17,9 °C	19,1 °C	20,1 °C
30 °C	16,2 °C	18,3 °C	19,9 °C	21,8 °C	23,3 °C	24,8 °C
35 °C	19,5 °C	21,9 °C	23,9 °C	25,9 °C	27,8 °C	29,5 °C
40 °C	22,8 °C	25,3 °C	27,9 °C	29,9 °C	32,1 °C	33,6 °C
45 °C	25,5 °C	28,8 °C	31,7 °C	34,1 °C	35,5 °C	38,0 °C



# FREEZAIR - Construction characteristics

**FREEZAIR** is designed and manufactured in Italy, can be used for air-conditioning or for insertion in a production context, and is customised according to the requirements of the designer or customer user.

All the management electronics are specifically designed to operate and control the FREEZAIR unit's cooling cycle.

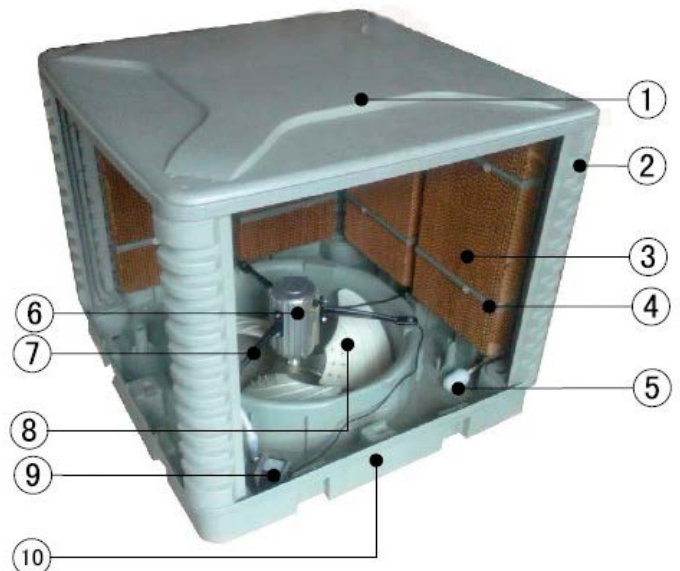
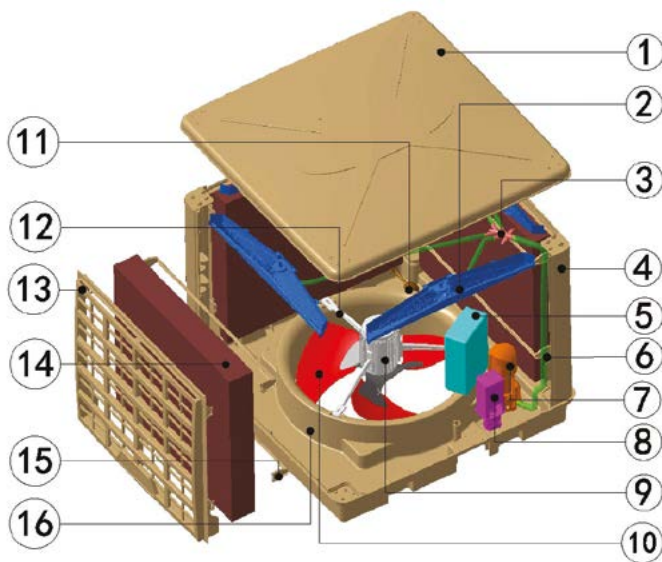
Each unit dialogues with the other coolers installed and with the stand-alone control panel, which allows the setting and ground control of the cooling system.

FREEZAIR units can be connected via BUS to facilitate connection and interfacing in large installations with several coolers, while maintaining centralised comfort management in a single ground control panel.

This facilitates the use of the cooling system in process cycles as in normal air-conditioning, thanks to centralised multi-zone management for the ideal comfort required in installations in large rooms.

In the electronic circuit there is an optional connection for operation with the air extraction system. This function is useful when installation in combination with extractors is required to balance the cooled air fed into the room. The same function is excluded when the system is used with ventilation only.

## STRUCTURE OF FREEZAIR COOLERS



FREEZAIR FA 18		
n°	DESCRIPTION	Qt.y
1	Upper lid	1
2	Water distributor	4
3	5-way pipe	1
4	Column support	4
5	Electric box	1
6	Water supply pipe	1
7	Water pump	1
8	Drain valve	1
9	Motor	1
10	Fan impeller	1
11	Water inlet valve	1
12	Fan supports	3
13	Side panels	4
14	Cellulose panel	4
15	Cellulose panel fixing	8
16	Bottom panel	1

FREEZAIR FA 30		
n°	DESCRIPTION	Qt.y
1	Upper lid	1
2	Column support	4
3	Cellulose panel	8
4	Cellulose panel fixing	16
5	Water inlet valve	1
6	Motor	1
7	Fan supports	3
8	Fan impeller	3
9	Water pump	1
10	Lower water tank	1

# FREEZAIR - Technical Data

MODEL		FREEZAIR FA 18	FREEZAIR FA 30
Air flow	m <sup>3</sup> /h	18.000	30.000
Electrical power	kW	1.1	3.0
Electrical power supply	V/Hz	230V/50	400V/50
Fan speed	n°	Modulating 3-speed	Modulating 2-speed
Control panel		Remote LCD	Remote LCD
Noise level	dBA	68	78
Headroom	Pa	180	320
Net weight	kg	78	110
Tank capacity	L	40	65
Water consumption	L/h	10-15	20-30
Average treated area	m <sup>2</sup>	100-150	200-250
Machine dimensions	mm	110×110×95	1340×1340×1200
Air outlet channel dimensions	cm	650 x 650	900 x 900
OTHER FEATURES			
Electric pump protection		Yes	Yes
Automatic drainage system		Yes	Yes
Automatic cleaning system		Yes	Yes
Pre-Cooling System		Yes	Yes
Programs storage system		Yes	Yes
Adjustable temperature and humidity		Yes	Yes

## FREEZAIR - Control panels

Three different control panels are available:



**CONTROL PANEL FOR SINGLE UNIT  
COD. FA00QC034**

Stand-alone panel low voltage powered directly from the power panel installed on the machine. Complete with temperature and humidity probe, suitable for managing all the functions of a single cooler, maximum distance between the machine and panel of 25m.



**CONTROL PANEL FOR MORE UNITS  
CODE FA00OT674**

Remote control unit for managing up to 16 coolers and 16 different climate zones. Remote use of temperature and humidity probe, maximum distance between the farthest machine and panel of 1,000m.



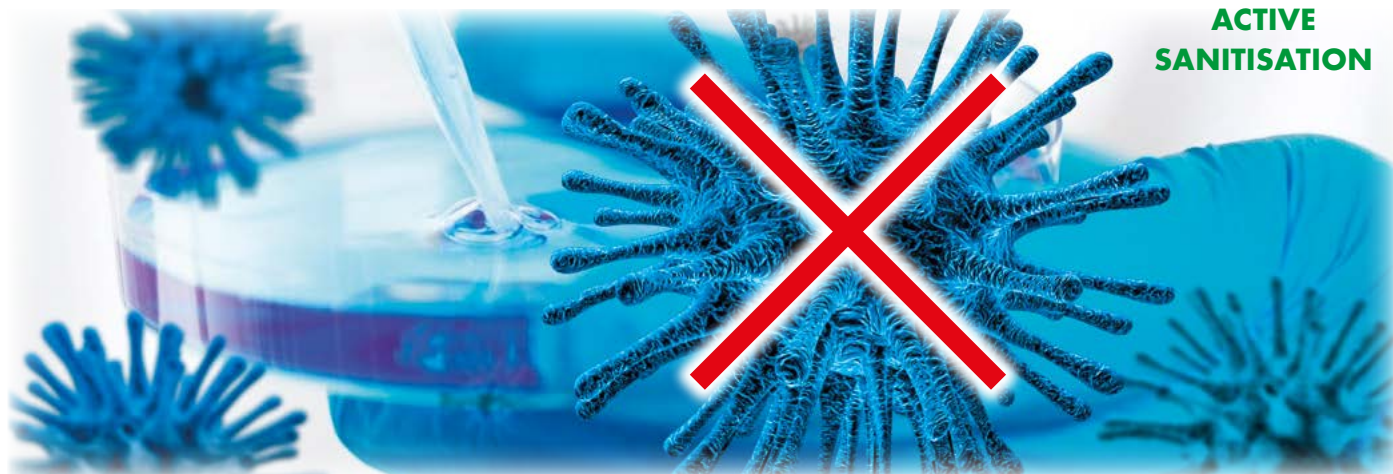
**CONTROL PANEL FOR MORE UNITS  
CODE FA00OT715**

Remote control unit for managing up to 30 coolers and 30 different climate zones. Remote use of temperature and humidity probe, maximum distance between the farthest machine and panel of 1,000m.

# Scientific tests on microbial agents prove the effectiveness of SANIFRESH



ACTIVE  
SANITISATION



Scientific tests conducted in the laboratories of US universities demonstrate the effectiveness of the **RCI (Radiant Catalytic Ionisation) technology built into the entire FREEZAIR SANIFRESH product range**, with results demonstrating a reduction in the bacterial load in the environment in just 24 hours from the first continuous operation.

## Testing RNA viruses:

- SARS-CoV-2 (also known as Wuhan coronavirus) is a member of the genus Betacoronavirus, itself classified by the Committee on Taxonomy of Viruses to Group IV - positive single-stranded RNA viruses, to which the tested MS2 virus belongs.
- Tests carried out by the Food and Drug Administration - U.S.A. on 31/01/2020 on the MS2 RNA virus confirm that the **RCI** technology inherent in **FREEZAIR SANIFRESH**, **reduces airborne contamination caused by the virus by 99.999% in less than 15 minutes**, which represents a logarithmic reduction to base 5.
- **The FDA claims that if MS2 is knocked down, potentially all virus RNAs are knocked down.**

## Among the studies were tests on su:

### BACTERIA

- Bacillus cereus,
- Candida Albicans,
- Escherichia Coli,
- Klebsiella pneumoniae
- Lysteria Monocytogenes,
- Moraxella,
- Pseudomonas,
- Stachybotrys Chartarum,
- Streptococcus Aureo R,
- Streptococcus Aureo,
- Streptococcus,
- Streptococcus spp.

### VIRUS

- Murine norovirus,
- Enterovirus,
- Influenza A Virus,
- Legionella,
- **Coronavirus**,
- MS2, H1N1,
- Hepatitis A,
- Avian flu.

### FUNGI

- Aspergillus,
- Penicillum,
- Mucor.





# The experts' opinion:

## INDICATIONS AND REFERENCES RELATING TO THE MINISTERIAL DECREES CURRENTLY IN FORCE

Recommended by the Ministry of Health for its efficacy against Covid-19, Hydrogen Peroxide (H<sub>2</sub>O<sub>2</sub>) generated by devices such as **FREEZAIR SANIFRESH** is totally harmless to humans and the environment and allows rapid sanitisation of any environment, without causing damage to materials and equipment.

After the forced closure due to the Covid-19 emergency, the Dpcm 10 April 2020 recommends that companies and shops carry out sanitisation of their premises against the Coronavirus risk.

It is important to remember that a simple disinfection of surfaces is not sufficient to completely sanitise an environment from Covid-19, because the pathogens would remain suspended in the air and in a short time would be deposited again on the surfaces.

It is therefore necessary for workplaces too to opt for total environmental sanitisation of both air and surfaces.

Furthermore, on 8 May 2020, the Ministry of Health intervened on the subject of the use of hydrogen peroxide (more commonly known as hydrogen peroxide), recognising that it is a chemical compound with a disinfectant function.

This compound has therefore been explicitly recommended by the Ministry of Health for Coronavirus prevention in healthcare environments:

Our technology is essentially based on the continuous formation of hydrogen peroxide (through a photocatalytic chemical reaction, which guarantees a natural process with no side effects) inside the aeraulic ducts and thus in the environments where the ducts feed. The process is continuous 24/24 h and 365/365 days.

Our approach to the problem of SANITIZATION OF AIR AND SURFACES INDOOR ENVIRONMENTS, carried out scientifically and with the development of a certified method (adapting and addressing the specific and different needs of individuals and companies) that with the collaboration of accredited laboratories allows us to demonstrate and guarantee the result achieved, makes us unique in our ability to reduce risks in closed environments where people live together for work or other needs.

Our MISSION is to restore liveability to public and private environments frequented by human beings. Thinking of no longer being able to get together with friends for an aperitif, at a wedding or on other occasions, means going against nature, means losing certainties in the path of our existence, since socialising is an integral part of our life (not to say that it is our very life), and allows us to maintain an emotional and mental balance.

With our companies and our large team of employees, we seek to give and be a global sanitation-technical answer to the worldwide problem of the spread of viruses and bacteria. Tackling and solving these problems with our method, which applies a continuous sanitisation technology dedicated to the individual area to be treated, can guarantee the salvation not only of human beings, but also of the world economy, which has not yet paid the price for the COVID-2 effect, but the bill will come in the coming months and should emergencies or lock-downs similar to those that have just occurred reoccur, either we will have prepared ourselves with a continuous process method of sanitising closed environments (without harming human health with aggressive chemicals with a carcinogenic effect in the medium and long term), or else we will be faced with an unprecedented humanitarian drama.

**Engineer Gianni Reginato**  
**Indoor Air Sanification Expert**



### Some of the major hospital centres using RCI technology:

#### European Hospital Centres

- Ruber International Clinic, Madrid, Spain
- FREMAP Hospital, Madrid, Spain
- FREMAP Hospital, Siviglia, Spain
- Public hospital in Pontevedra, Sergas, Spain
- Clinique des Murins, Orleans, France
- Clinique de l'Archette, Olivet, France
- Clinique des Buissonnets, Olivet, France
- La Timone Hospital, Marseille, France
- Clevedon Hospital, Somerset, United Kingdom
- Cheshire NHS Treatment Centre, Liverpool, United Kingdom

#### American hospital centres

- Jacobi Medical Center, New York, USA
- Crossroads Community Hospital, Illinois, USA
- Laughlin Memorial Hospital, Tennessee, USA
- Hospital pediatrico 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 Portoghese, Sao Paulo, Brasile
- Reale Ospedale Portuguê, Recife, Brasile
- Unimed Sao Roque, Sao Paulo, Brasile

# FREEZAIR - Some applications



## FREEZAIR - Some applications



## HYBRID SYSTEMS



## INDUSTRIAL OVENS



## LITHIUM BROMIDE ABSORPTION CHILLER



## ENERGY RECUPERATOR



## SPLIT SYSTEMS



## OUR MISSION

Founded in 1986 as a manufacturer of industrial furnaces, Comex Group has built its history on a fundamental value: technological innovation. Many years of experience in the heating and air-conditioning sectors, combined with the continuous acquisition of know-how on new technologies and applications, have enabled the company to apply solutions that are always up-to-date using heat pump systems, solar cooling, heat recovery, thermal power stations and, most recently, air sanitation. Research and innovation have distinguished the company in the heating and air-conditioning sector with important advantages for Comex Group customers in the areas of energy saving, safety and environmental protection.

The data in this brochure are intended as an indication and are not binding. Comex Group reserves the right to make changes without prior notice.



**Comex Group S.r.l. LOREGGIA (PD) Via Europa Unita, 19 Tel. +39 049 9302774**  
**[www.comexgroup.it](http://www.comexgroup.it) - [info@comexgroup.it](mailto:info@comexgroup.it)**