

Do you ever think about the **air** you **breathe?**

HEALTHY AIR PROGRAM

Integrated Contamination Prevention and Remediation Programme

SICOM Srl








SICOM Srl

www.sicomsrl.net

COMPANY

SICOM Srl (Italian Construction and Maintenance Company) was established through the combined synergies and expertise of a group of professionals who, each in their own field, have 30 years of experience in the technical and economic management of construction and maintenance, with a special focus on protecting the ENVIRONMENT.

HISTORY

With the experience gained by its collaborators, SICOM Srl has first-class technical know-how based on the design, implementation and execution of works for public and private clients in healthcare and industrial facilities, hospitals and complex buildings. Special attention has always been given to after-sales service, assisting clients by solving management and maintenance problems and offering a 24-hour service, 365 days a year. In this sector, SICOM has developed and applied procedures to ensure client satisfaction.

THE PRESENT

SICOM Srl is currently operating in the management and maintenance of plants and buildings, with a focus on energy efficiency and improving quality of life, while concentrating on managing and improving air quality. The operating procedures applied, resulting from thirty years of technological and training upgrades, enable us to stand out in the market. As a result, we can offer our clients not only ACCREDIA-certified documentation confirming the positive outcome of our work, but also an insurance policy issued by a leading Italian insurance company to guarantee the work carried out and cover any claims for damages by third parties.

THE FUTURE

SICOM Srl is developing its HEALTHY AIR PROCESS system, designed to offer customers overall TRANQUILLITY regarding air quality and healthy working environments. The HEALTHY AIR PROCESS system uses new equipment for bacterial sanitisation, continuous indoor-air monitoring, and the sterilisation of spaces and furniture with the aid of cutting-edge technologies. This creates a continuous cycle of interaction between buildings and people.

MISSION



Do you ever think about the **air** you **breathe?**



THE PROBLEM

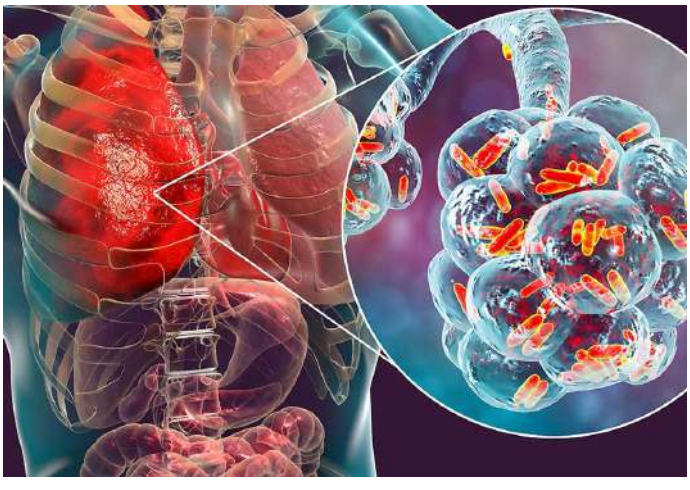
Data on the spread of infectious agents causing diseases in patients and healthcare workers show that surfaces play a major role in spreading microorganisms in the nosocomial environment.

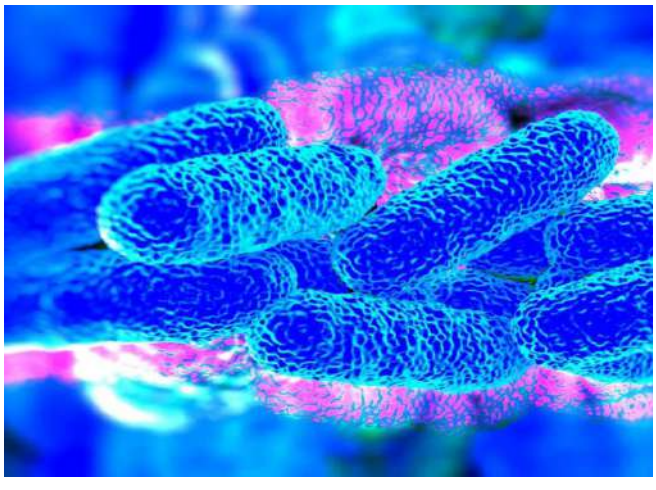
The presence of biological agents on the surfaces of equipment, furniture, objects, etc may be a risk for patients and healthcare staff.

With regard to surface contamination, much scientific research focuses on hospital environments, where the problem of the microbiological contamination of surfaces and equipment is particularly prevalent. In 1968 Spaulding identified three types of environmental surfaces semi critical and non critical) in the nosocomial environment in order to determine requirements for cleaning and sterilising such surfaces depending on their use (diagnosis and treatment) and therefore the extent of the risk of infection.

Over the last decade, the role of the environment in transmitting multi resistant microorganisms in hospitals has become increasingly important due to a rise in the incidence of nosocomial infections Hospital acquired infections occur during hospitalisation or, in some cases, after the patient has been discharged, as they are not present when the patient is admitted.

The Committee for the Prevention of Hospital acquired Infections (set up at all hospitals in accordance with the Ministry of Health circular no. 52/85 and the Ministerial Decree of 13 September 1988 “Setting standards for hospital staff”- Article 2) has the specific task of preventing and controlling such infections while guaranteeing the quality of the healthcare provided Many studies in this field have emphasised the role of the inanimate environment in the epidemiology of infections caused by pathogens such as methicillin-resistant Staphylococcus aureus (MRSA), vancomycin-resistant Enterococcus spp. (VRE), Clostridium difficile, Acinetobactersp.p and norovirus. These microorganisms can survive in the environment for hours or days (and in some cases months), contaminating non-critical surfaces of furniture, equipment, objects, etc. (Dancer, 2009).





HEALTH RISK

If unhealthy or unmanaged, the air we breathe in every day can damage our health This is partly due to air pollution, particulate matter and bacterial load both outside and inside buildings According to some research results, the parameters for indoor pollutants were always higher than outdoor pollutants in the same location.

With regard to people residing in healthcare settings, exposure to indoor air pollutants for extended periods of time creates more problems, as it is often those categories, children, the elderly and patients in general, who are most exposed and the weakest.

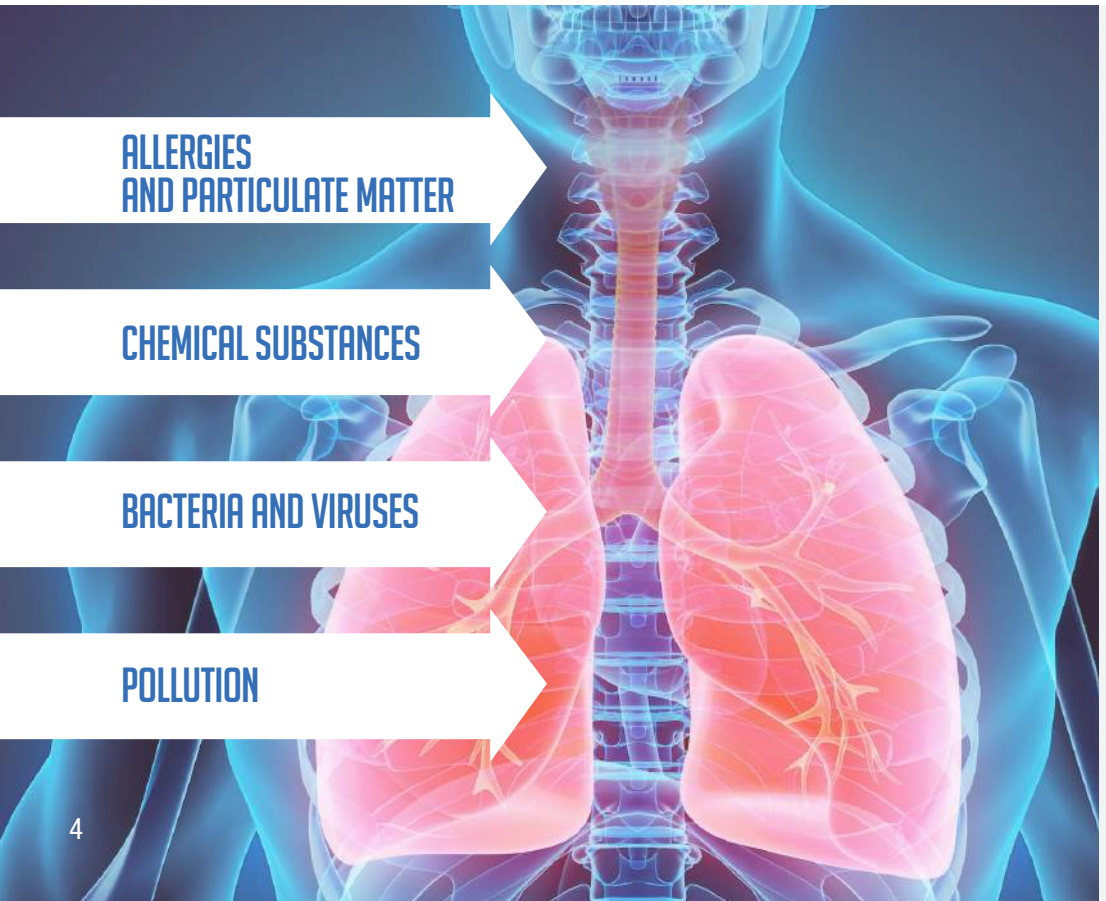
Contamination caused by incorrect aeraulic management can be divided into CHEMICAL, as it is the result of the accumulation inthe system of polluting particles from outside, and MICROBIOLOGICAL, caused by various pathogens and the proliferation in equipment of microorganisms such as bacteria, viruses, moulds and yeasts (Staphylococcus Aureus, Pseudomonas Aeruginosa, Legionella Pneumophila etc, viruses and fungi (Aspergillius, etc.)

Such contamination may lead to various pathologies such as those linked to the Unhealthy Building Syndrome, those linked to buildings in general infectious syndromes such as Legionellosis or Influenza syndromes such as Tuberculosis, or Allergic or Immunological syndromes.

LEGAL RISK

Legislative Decree no. 81 2008 including its annexes and subsequent amendments, see www.ispettorato.gov.it on the protection of health and safety in the workplace, specifically addresses the problem of the correct and regular hygiene of aeraulic systems. The various regulatory provisions state that the systems must be regularly checked, maintained, cleaned and sanitised in order to protect the health of workers and people who are staying or are present on the premises.

Any illnesses resulting from non compliance with the aforementioned Legislative Decree may lead to various offences for an. Employer the first is of a civil nature with claims for compensation of a BIOLOGICAL and MORAL nature for any damage suffered whereas the second is of a criminal nature resulting from the concurrence of certain cases of culpable offence, for example, refer to Art. 452 of the Italian Code of Criminal Procedure (public health), Art. 590 of the Italian Code of Criminal Procedure (Personal Injury).



EFFECTS ON HEALTH

IN THE SHORT TERM

- Allergic reactions
- Eye infections
- Irritation of the nose and throat
- Bronchitis
- Pneumonia
- Headaches and nausea
- Respiratory difficulties
- Skin reactions
- Asthma attacks

IN THE LONG TERM

- Chronic respiratory diseases
- Lung cancer
- Heart diseases
- Brain and neurological damage
- Damage to internal organs

HEALTHY AIR PROGRAM

PROBLEM
OUTDOOR - INDOOR POLLUTION

RISKS

HEALTH RISK

RISKS

LEGAL RISK

SICOM Srl SOLUTION

HAP™

ENVIRONMENTAL SANITISATION AND REMEDIATION

SANITISATION OF AERAULIC SYSTEMS

AIR CHECK™



HEALTHY AIR PROGRAM

The basic HAP system is an integrated one that monitors, prevents and eliminates contamination of the air we breathe inside buildings, in compliance with Italian technical regulations.
Its operation starts with a diagnostic phase to determine the contamination situation of the aeraulic system, followed by video detection of the internal state of the air ducts and an analysis of the bacterial load and quantity of particulate matter present.
On the basis of the results of the analysis, steps are taken to eliminate any problems by cleaning the air ducts and AHUs, with a complete sanitisation process certified by an ACCREDIA accredited laboratory.
As a result of its experience gained over the years, SICOM has implemented the basic HAP system with an upgrade that covers verification and remediation work on fan-coils and split units installed inside premises not provided with aeraulic ducts, carrying out the same procedures and certifying their healthiness. Thanks to the cooperation of our technological partners, we have further implemented the HAP system, achieving active and constant sanitisation over time This is monitored online by probes and sensors that transmit the detected parameters to the control room, thus guaranteeing a high level of safety.
Nevertheless, all laboratory checks and analyses will be carried out on a half yearly basis to verify the correct functioning of the HAP system in accordance with the regulations in force.
To complement the HAP system, we offer a disinfection system for premises under an exclusive agreement with a leading manufacturer of sanitary equipment The use of mercury vapour UVC ultraviolet light can destroy 99% of pathogens, reducing infections contracted in hospital environments by 30%.
With the total application of the HAP system, we can provide not only maintenance, control and certification of the results by issuing an updated RAD but also insurance for compensation for any damage caused by eventual problems created by the aeraulic system and environmental contamination in the premises undergoing HAP.

DUCT SANITISATION

Cleaning and sanitisation is carried out on AHUs, air ducts, split units and fan-coils. Cleaning techniques involve the use of a suction cleaner and rotating brushes mounted on a flexible cable or on remote-controlled robots or high pressure compressed air-driven heads, depending on the dimensions.
The dust and dirt removed by the brushes are collected in a “filter bag” located downstream of the suction cleaner.
The execution of the work is monitored before and after by a camera and/or video camera that can inspect the inside of components and simultaneously record the entire activity. Sanitisation is carried out using specific disinfectant products approved and validated by the Ministry of Health by means of direct application on the components and using equipment that injects germicidal aerosols into the air ducts. Depending on the volume of the air duct to be disinfected, a correct Kjenzley algorithm calculates the inflow and saturation times prescribed for the use of each individual disinfectant agent, thus guaranteeing total disinfection of the air conditioning system. This is followed by aeration of the premises undergoing intervention.

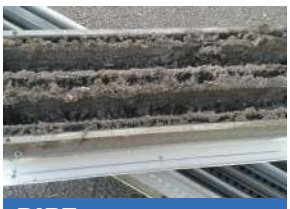
HAP™



LEAKAGES



FOREIGN BODIES



DIRT

BEFORE



DURING



AFTER



SANITISATION OF PREMISES

The sanitisation procedure should be carried out in all environments where people are present, mainly where there is a high risk for health of contagious or dangerous pathologies. The process is carried out by saturating the atmosphere in the premises, which have been previously sealed, with the nebulisation of germicidal substances by means of a dry aerosol, approved by the Ministry of Health.

We could identify, as an example, some areas that we consider “HIGH RISK”: infectious disease wards, operating theatres and units, neonatal pathology and paediatrics, ICU, CICU, haemodialysis, haematology and transfusion centres, accident&emergency, air ambulances, ambulances, etc.

In these areas, it is IMPORTANT to reiterate that continuous control and prevention protocols must be implemented to ensure that the air quality in such environments is healthy and corresponds to legally required parameters When fully implemented, our HAP system can therefore become a GUARANTEE for a GLOBAL SOLUTION to prevent contamination by particulate matter, viruses and bacteria.





The company goal of SICOM Srl is to obtain and maintain an ENVIRONMENTAL BALANCE. The HAP CLEANING concept represents the new generation of solution systems with an overall cycle This system of ours is based on stabilised hydrogen peroxide (H2o2) and the oxidising powers of ozone (O3) thereby demonstrating the attention SICOM focuses on the problem of contamination and protecting people’s health with its AIR CHECK system.
Based on the method and specifications of ISO certifications, HAP offers solutions for the indoor BIO-disinfection of premises, equipment, furniture and air conditioning systems with the following technologies and features.

HYDROGEN PEROXIDE

With stabilised H2O2 nebulisation, we guarantee a 99% certified result using biodegradable products, thus ensuring the prevention, control and elimination of biological risk from contamination by viruses, bacteria and other pathogens.

The disinfectant action is achieved by changing the state of the sanitising compound based on stabilised hydrogen peroxide (H2O2) from liquid to gaseous form It is atomised by a special atomising turbine and nebulises the active substance at a temperature of 36.5° C at a speed of 82 m/s, rapidly saturating the ambient atmosphere with condensation-free microparticles, just a few microns in size Due to its special chemical composition (bio osmotized water and hydrogen peroxide), this disinfectant is a BIO product.

This saturation generates the production of OH-hydroxyl radicals, which are responsible for the biocidal action of the process, as highly oxidising hydroxyl radicals encounter the membranes of bacteria, which contain Calcium and Sodium Chloride (NaCl). They are deposited and the OH-ion transforms the chemically stable chlorine in the membrane into active chlorine (CL2), leading to the destruction of the bacterial membrane and preventing the reproduction of bacteria.





The compound, entirely based on hydrogen peroxide, spreads evenly over every square centimetre of free surface in the environment and over every volume of air without generating moisture, corrosion or residues. The small dimensions of disinfectant compounds increase the nucleation effect in the microorganism cytoplasm. The rapid decomposition of OH-radicals into H2O and O2 makes the compound non-toxic and non carcinogenic for staff, whose presence is not allowed during the atomisation process, and highly efficient against viruses and bacteria.
Moreover, using hydrogen peroxide in ideal concentrations of the products employed ensures zero corrosion on the materials present in the premises and the systems to be treated.
When saturation is over, the product, which does not generate organic compounds in suspension, must be left for about 15-20 minutes in order for it to take effect Its 99.99% degradation is fast (about 20 minutes) and it entirely dissolves in the air, leaving no deposits or residues on surfaces.

OZONE

With protocol no. 24482 of 31 July 1996 the Italian Ministry of Health acknowledged the use of ozone in air and water sanitisation treatment in Italy, as a natural aid for sterilising contaminated environments It involves inactivating pathogens such as bacteria, viruses, spores, moulds and dust mites, also on the basis of a series of scientific validations and a “disinfectant and disinfestant agent in air and water treatment” with the CNSA of 27.10.2010.



Ozone is a natural oxidising gas composed of trivalent oxygen (O3), which dissolves and tends to return in the form of oxygen (O2), leaving no trace or chemical residues, as a disinfectant and disinfestant agent With a wider spectrum of microorganisms, its oxidising action and lipid peroxidation guarantee an excellent bactericidal, fungicidal and inactivating function of the specific viral receptors used to create a bond with the wall of the cell to be invaded, blocking the viral reproduction process at the level of its initial phase cell invasion.(See the Table for timing).
Ozone perfectly disinfects without any need for chemical additives and detergents. It is non-flammable, non-explosive, does not damage the environment or its contents and, above all, does not harm living creatures, people or animals.

The selected system, based on certified portable equipment manufactured in Italy with a low energy impact, is positioned in the rooms to be sanitised and activated after the environmental parameters have been appropriately set. Intervention times depend on the type of contamination present, which must be previously determined by the RAD Environmental Risk Assessment Document drawn up by SICOM Srl certified technicians. The cyclical presence of ozone in the micro atmospheres of the treated rooms helps to keep the environment sanitised.

ORGANISM	CONCENTRATION	EXPOSURE SWAB
BACTERIA (E.Coli, Legionella, Mycrobacterium, Fecal, Streptococus)	0,22 ppm - 2,2 ppm	< 20 minutes
VIRUSES (Poliovirus type-I, Human Rotavirus, Enteric virus)	0,2 ppm - 4,1 ppm	< 20 minutes
MOULDS (Aspergillus Niger, vari ceppi di Penicillum, Candida Tropicalis)	2 ppm	60 minutes
FUNGI (Candida parapsilosis, Candida Tropicalis)	0,02 ppm - 2,26 ppm	< 1,67 minutes
INSECTS (Acarus Siro, Tyrophagus Casei, Tyrophagus Putrescientiae)	1,5 ppm - 2 ppm	30 minutes?

Inactivation of bacteria, viruses, fungi, moulds and insects by ozonization



STEAM

Sanitisation with steam equipment is used in public and private buildings such as hospitals, municipalities, nursery schools, schools, communities, offices, shops, restaurants and bars, as it allows internal surfaces to be sanitised and thoroughly cleaned, thereby achieving eco sustainable cleaning without using chemical detergents while respecting the environment.



High operating temperatures and the relative thermal shock produced by the steam eliminate any microorganisms, bacteria, germs and parasites present, thereby guaranteeing complete and total sanitisation even in spaces that are difficult to reach. It is therefore ideal for cleaning electrical and electronic parts.

In addition to sanitisation, steam is also effective in removing murals, graffiti, writing on walls, chewing gum on floors and cleaning with Fog System.



FOG SYSTEM

This is carried out by nebulisation and micronisation using piston pumps compressing H2O with the addition of high performance germicidal sanitisers with approved safety data sheets.
This system is useful for implementing sanitisation, saturation and/or vacuum sanitisation.





COATING

The COATING process is required where old style aeraulic ducts are present that have been insulated with an internal coating consisting of a high-density mat of limited thickness made of glass wool and/or rock wool pressed and covered with a starched layer in the same material that ensured the containment of fibres.

Over time, with the continuous flow of air and its related micro particles, this coating may start to flake off at certain points where greater pressure is exerted due to turbulence or particular air flows. Deteriorated surfaces are more susceptible to releasing particles of the coating material into the air in the duct, to bacteriological contamination and to depositing particulate matter. Over time, the degenerative process results in the ever-increasing flaking of the inner lining fibres, which can no longer be sanitised, causing a serious health problem in the system.

To remedy this, the inside of the channels need to be treated with a COATING process, carried out by means of a full internal encapsulation process using water-based resins, with antibacterial, anti fungal and anti mould properties, as well as excellent mechanical resistance for future cleaning.







TAMPONI

To certify that hygienic conditions are safe, environmental swabs are used and subsequent laboratory analyses are carried out to check the healthiness of the work environment, the air conditioning system, fan coils and split units. They reveal the possible presence of particulate matter, bacteria and viruses in compliance with current safety and hygiene regulations. Such tests are carried out before and after remediation and sanitisation procedures.

Environmental swabs, regarding all air passage surfaces, are microbiological tests carried out by qualified professionals in specialised and ACCREDIA-certified laboratories. They are performed in compliance with the standards set out in the attached literature, the results of which will certify the cleanliness of the surfaces analysed.



SICOM Srl

TM

AIR CHECK

We spend up to 90% of our time indoors, including 40% in workplaces.

The air we breathe indoors is treated and distributed by air conditioning systems, which may often contaminate the air. Thanks to active sanitisation systems that generate natural oxidising ions, transported by the air flow, pollutants in air ducts and rooms are destroyed. Hydrogen peroxide can destroy most compounds such as bacteria, viruses, moulds, allergens and unpleasant smells, also acting by gravity on the surfaces of treated premises.

It is a far more effective solution than classic passive systems (traditional filters and germ lamps).

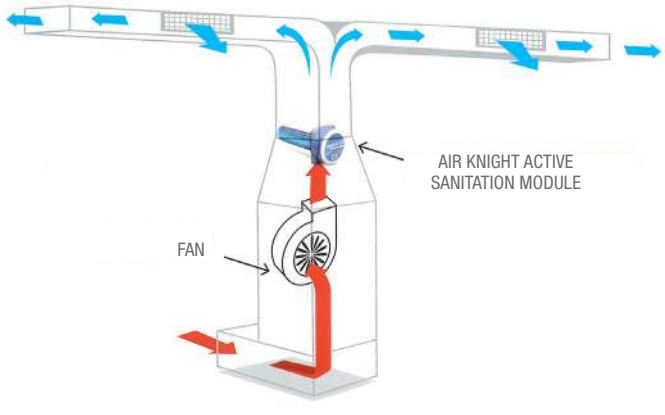
With a 99% reduction in bacteria and moulds, Air Control systems and filters guarantee the best air sanitisation in Commercial, Industrial, Residential, Offices, Food and Hospital environments, and can also be used in Restaurants, Bars and Transport systems.

SteriPro UVC robots, particularly suitable for medical and hospital sectors, effectively destroy various microorganisms such as MRSA and VRE with ultraviolet C light.ww They have a

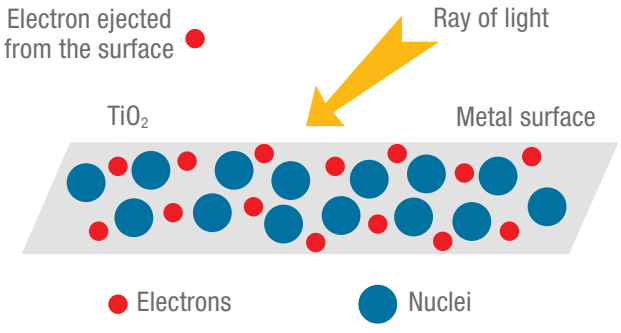
guaranteed efficacy of 99% with a treatment time of 5-15 minutes for each disinfection cycle.

This is one of the most effective products on the market with a 5-year warranty.





PHOTOCATALYSIS





HAP™

SYSTEMS

ENVIRONMENTS

RAD
SWAB ANALYSIS
MICROCLIMATE
VIDEO
INSPECTIONS

SANITISATION OF AERAULIC SYSTEMS AND COMPONENTS

ENVIRONMENTAL SANITISATION AND STERILISATION

air control
Tecnologie per il controllo dell'aria

Domotika Project

MITSUBISHI HEAVY INDUSTRIES

Termal





STERIPRO™
UV-C DISINFECTION TECHNOLOGY
Made in Slovenia



AIR CHECK®

INSURANCE AGAINST FUTURE DAMAGE

MANAGEMENT, CONTROL AND ONGOING MAINTENANCE

REMEDIATION CERTIFICATION









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