Cold Plasma

Bipolar Ionisation

Intersam®

energy and purification

Natural Atmospheric Process

Ions, positive and negative, can be found in the air we breathe. This electricity is prevalent in the earth's atmosphere, with sometimes very pronounced local variations. The usual ratio is five positive to four negative ions. Positive ions are formed by the sun's ultraviolet radiation and by cosmic rays. On the other hand, negative ions are formed by electrical discharges that occur with lighting, water pulverisation during heavy rains, waterfalls, and in the ebb and flow of turbulent waters.

We can also generate ions by means of

Cold Plasma Bipolar Ionisation Systems

creating the same well-being and air quality sensation

***Intersam** offers this technology as an option across its entire product range*

Cold Plasma Bipolar Ionisation

implementation in HVAC systems

(Heating, Ventilation and Air Conditioning)

This technology is suitable for HVAC systems and matches the flow rates to be treated. Based on equilibrium engineering, it ensures homogeneous, high-precision ionisation with guaranteed efficiency.

Ionisation is endorsed and implemented with the purpose of generating safe and healthy spaces against COVID-19; it also eliminates pollutant components and cleans air so that it complies with safety parameters, tested and proven by laboratories.

HOW DOES IT WORK WITH POLLUTANTS AND PATHOGENS?

Plasma technology emits ions that bind or adhere to air particles, altering the chemical state of gases, harmful compounds (VOC), viruses (COVID-19), bacteria or pollutants such as odours, which are effectively neutralised through a Redox reaction, an ionisation phenomenon that occurs naturally in the atmosphere. This biocompatible and ecological system offers a continuous treatment and provides a healthy environment by optimising the properties of renewed air. These systems and technologies not only minimise and control the virus (all types of viruses, in fact) in indoor areas (the environment where the largest number of infections occur), but also help achieve productive, healthy, and efficient environments.

All **Intersam** Cold Plasma Bipolar Ionisation equipment provide clean, high-quality indoor air for everyone. They are 100% safe, as they do not produce ozone or any other harmful by-products. Our models are approved by the UL and CE standards, and tested by independent laboratories. This technology reduces pathogen concentration, unpleasant odours, suspended particles (VOCs), viruses and bacteria. These systems can be installed in any air-conditioning system and in any location.

You can save energy and reduce your carbon footprint by lowering the outside-to-inside air ratio without having to modify your system. Cold plasma ionisation safely cleans the air. Our patented technology uses electric charges to create a plasma cloud with a high concentration of **+** and **-** ions.

As the ions travel through the air flow, they bind to particles, pathogens and gas molecules. Ions assist in agglomerating these microparticles, making it easier for filters to trap them. They also eliminate pathogens by "stealing and recombining" vital hydrogen molecules, and break down odour-producing volatile organic compounds into harmless compounds such as O2, CO2, N2 and H2O. As they travel through the air flow, the ions spread throughout the occupied space, cleaning and purifying all areas reached by the air flow, including non-visible spaces.

Bipolar Ionisation in the Food Industry

guarantees deactivating COVID-19

Intersam
i-ONIC
range

Origin and present of bipolar Ionisation in the food industry:

With the increase in demands by food safety regulatory authorities and food trade globalisation, the pandemic has sparked efforts to communicate the efficacy of bipolar ionisation as a hygienic and phytosanitary treatment at all levels within the food industry, including producers, manufacturers, distributors and consumer organisations.

International implementation and present

It was in the 1960s that 'food preservation using ionisation reached an industrialisation threshold in several developed countries,' including Spain. On 6 October 1966, a Decree (2725/1966) was issued regulating the preservation of food for human consumption using ionisation. In the same year, the Comisión Asesora de Conservación de Alimentos por Irradiación (Advisory Commission on Food Preservation Using Irradiation) was also created. In 1966, safety studies were completed on 21 foods, in which the technology approved by the US Food and Drug Administration (FDA) was applied to sterilise bacon and pork, disinfect wheat and inhibit sprouts in potatoes. Subsequently, studies were carried out on a wide variety of foods in the USA and, as interest in Europe increased, in 1970 the International Project in the Field of Food Irradiation (IFIP) was initiated. IFIP collected data on the application of bipolar ionisation.

Bipolar ionisation is primarily a biosafety and infection prevention project, and it has proven to be effective in deactivating the Sars Cov 2 virus present in bioaerosols. It also reduces pollutant components such as particulate matter formed by VOCs, formaldehyde and harmful gases in the air. This results in a bioclimate with clean air and free of pathogens.

Intersam's bipolar ionisation equipment is especially suitable to prevent bacterial growth in the food industry, taking food preservation to the next level. Its advantages are scientifically documented;

- Prevents germination and sprouting in potatoes, onions, garlic and other vegetables
- Disinfects grains, fruits, vegetables and nuts
- Delays ripening and ageing of vegetables and fruit
- Increases the shelf life of fish, seafood, fresh meats and poultry meats by destroying spoilage microorganisms
- Prevents food-borne diseases by eliminating pathogenic microorganisms
- Reduces microorganisms in herbs and spices
- Kills viruses, bacterial spores, gram-positive bacteria, gram-negative bacteria, moulds, yeasts or parasites

ISO Cleanrooms

obtaining the most demanding qualifications

ISO 14644 Standards

The International Organisation for Standardisation, better known as ISO, is the body that sets and controls international manufacturing standards for all industrial areas, including Cleanrooms. Its main purpose is to set international standards. The standard specific to cleanrooms is ISO 14644, and consists of different parts dealing with their different aspects. It establishes the classification of air cleanliness by chemical concentration (ACC) in cleanrooms and associated controlled environments, in terms of airborne concentrations of specific chemical substances (individual, group or category), and provides a protocol to include test methods, analysis and time-weighted factors within the specification for classification.

How to obtain the ISO certification for food processing rooms

A HACCP (Hazard Analysis and Critical Control Point) must be carried out. This is a fundamental requirement to guarantee food safety at all points of the food production process. It is one of the most important prevention systems available to companies in the sector, as it detects the risks faced by food in its preparation, production, packaging, transport and display for sale.

The relevant autonomous community and the Inspectorate of the Ministry of Health, Social Services and Equality are in charge of approving the sanitary conditions of a company. They can also determine whether the products are fit for human consumption and whether its facilities, in this case, the food cleanroom, are suitable for food production. In addition to the approval by the Administration, companies in the sector must strictly comply with ISO 14644 and GMP standards. International standards, with specific regulations for food companies, must be followed to the letter. These include hygiene and phytosanitary requirements that companies must meet in their facilities, or when moving and handling food.

On the other hand, for a food cleanroom to be efficient, it must completely control the following parameters:

Temperature
Relative Humidity
Air flow
Pressure
Lighting

Number of particles in the air

It is necessary to implement a pass-through SAS to access and leave the Food Cleanroom and to keep the environment clean and unpolluted. This can be achieved through continuous air treatment for its proper sterilisation in terms of particulate matter and VOCs. It is also important to carry out exhaustive control, maintenance and cleaning of the cleanroom before and after carrying out any process, in order to maintain the required hygienic conditions. The introduction of cleanrooms in the food industry has been a natural process, as cleanliness and product care make the difference in this market. This sector demands the highest hygienic conditions, so the aforementioned requirements for food cleanrooms are crucial for the production process.

Once the equipment has been installed, ions are measured in different points within the treated space. Pollutant levels will gradually begin to decrease, and this will help increase ionised air flow conductivity. Before recombining, these ions become more prevalent over time, so measurements will become higher and more stable.

For the measurement test, high calibration equipment shall be used, which must be placed in different data collection points for 5/10 minutes. At first, data is to be collected with the ionisation equipment off, to check natural ionisation. Then, the systems are turned on, supplying ionised air over the area, and the test is started. The information obtained at each reference point is recorded in software, where metrics on ions with maximum and minimum values are collected in real time. Temperature and humidity are also recorded, thus generating a detailed report for the client.

Ionisation and Health

benefits for the body

The respiratory system works much better when the environment is charged with ions, which eliminate harmful substances. They stimulate sexual activity and improve fertility, both in men and women. They also help fight against diseases and skin problems such as psoriasis, acne or burns, among others.

Ionisation is part of a healthy environment. It is one of the tools nature uses to maintain and clean the air. It exists naturally in the atmosphere, and a great amount of ionisation has very beneficial effects on humans, animals and plants.

Human activities tend to decrease the amount of ionisation in the atmosphere. The problem is only greater when examined in the context of indoor environments, especially when considering the amount of time city dwellers spend breathing indoor air. Ion-generating technology can adequately address many problems related to indoor air quality, promoting health, comfort and well-being.

The future of indoor air quality

Spreading solutions to sterilise areas against COVID-19 in all sectors (public and private) is an important, positive and necessary vocation. IAQ (Indoor Air Quality) will be of vital importance to achieve normality and provide healthy environments to buildings and guarantees to workers and clients. Our vision concerning health infrastructures and energy efficiency in buildings (BIOCLIMATE) has its origin in these values; and we believe they will improve our commitment to the environment. Ionisation reduces pathogens, bacteria, mites, pollen, harmful gases, VOCs, PM 1.0, PM 2.5, PM 10 (bioaerosols). Besides, it also leads to energy savings. In a broad spectrum, these factors greatly contribute to achieving clean, safe and environmentally-friendly environments.

Physiological, mood and emotional effects

- Eliminates stress and anxiety
- Helps relax more easily
- Improves memory and concentration
- Regulates blood pressure
- Has analgesic effects
- Increases mental and physical performance
- Decreases aggressiveness
- Cleans and purifies the air, freeing it from smoke, viruses, bacteria, pollen and dust
- Purifies blood
- Restores cells
- Strengthens the immune system
- Improves the respiratory rate
- Decreases the basal metabolic rate
- Decreases blood pressure
- Gives a sense of well-being
- Increases vital capacity
- Improves the metabolism
- Accelerates the conversion of succinate to fumarate
- Stimulates cytochromes
- Decreases eosinophilia and lymphocyte count
- Decreases the blood sedimentation rate

i-Onic
SYSTEM

ISO 9001
BUREAU VERITAS
Certification

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