



Limited liability company

"OZONE TECH", Latvia



Matseco Aircode™ Ionisation Systems

PRODUCER: Matseco AB, SWEDEN, www.aircode.se

Overview

How does the technology work?

Aircode products supply the indoor air with negative and positive ions through cold plasma reduction. The negative ions attract positively charged particles in the air and cause the particles to bond to nearby objects. The airborne particles clump together and then fall to the surface by the added molecule weight. The method can be used to clean all types of particle from the air. This is a way of reducing the pollutants in the air and we are prevented from inhaling them. When the ions are neutralized, the molecules that hold the particle together are separated and the original coalescence is lost. This can mean that odours and bacteria disappear for example. The positive ions that are added mean that the environment can be controlled. If positive ions were not added, all particles would stick to walls, people and other objects. A lot of positive ions are formed in our immediate proximity during heating or cooling using air conditioning as well as around computer screens and other monitors. Synthetic materials in curtains, clothes etc. also attract negative ions and leave behind air that is less suitable to be in.

Particle reduction

Paper processing up to 99% airborne particles

Metal processing up to 90% smoke, oil mist

Plastics processing up to 99% solvents

Print works up to 99% benzene, toluene

Food industries up to 99.9% mould spores, smell and bacteria



Ionisation

Frightening information

Particles are continuously on the move in the air. Less than 10% of these are macro-particles that can be seen with the naked eye. The remainder, 90% in other words, are called micro or nano particles and are so small that they are perceived as fog or smoke.

The human body is fantastic at filtering things but it is sensitive to high concentrations of micro particles. Researchers have now found that humans suffer considerably from the particles that enter the lungs and stay there.

Today's ventilation filters and installations have great difficulty with particles that are so small that they are nanosized. Filters are unable of capturing these in installations with the result that they are allowed through and enter most environments that exist today.

Will everybody suffer from allergies soon?

Air that is beneficial to us contains a good balance between positive and negative ions. The negative ions seem to give us a general feeling of wellbeing and they also have a favourable effect on our bodies. A good indoor environment is important for avoiding health problems. This is particularly important for people with asthma, allergies and other hypersensitivities since they often react sooner and to a greater extent to inadequacies in the indoor environment than those who are healthy. We spend 90% or more of our time indoors and indoor air is often of a poorer quality than outdoor air.

When more people than usual experience difficulties and these are linked to being in a particular building, we normally talk about a sick building syndrome. Moisture and mould damage, inadequate ventilation, poor cleaning and air pollution – known as chemical emissions – occur. It has also been discovered that people can develop asthma in poor indoor environments such as in a house with moisture problems.

The link between air passage problems and heart and coronary illnesses and outdoor air's high particle content has been carefully studied with frightening results. Studies

in Sweden show that 350 people in Stockholm and Gothenburg die every year from heart and coronary disease cause by particles. The primary source is particles from petrol-driven and diesel-driven cars, rubber tires and even wood burning. The problem is probably greatest in public areas where ventilation maintenance is not done correctly. But nano particles are also found in houses and indoors there are millions more really small particles in the air.

Nature's own method

It is well known that plants, trees, active earth and radioactive substances produce ions. As usual, forests and the countryside are particularly important in this case since they generate a large number of negative ions. Fresh air contains approximately 2000-4000 negative ions per cm³ air. In nature the average distribution is 4 negative ions to 5 positive ions. A distribution of 5 negative ions to 4 positive ions (approximately 2500 ions per cm³ in total) has been measured in the forest in the vicinity of small urban areas (such as in the county of Kronoborg). The distribution in densely populated areas and enclosed spaces (indoors) is quite different and there is a marked deficiency of negative ions and sometimes none at all.

Thundery weather an example

Several hours before bad weather the concentration of positive ions in the air increases. This increase is caused by positive ions preceding weather fronts by one to two days since electricity travels quicker than air. This feels oppressive and the quality of the air feels poor. When there is an outbreak of thunder, wind and rain the concentration of negative ions in the air increases significantly while the positive ions decrease. The air feels fresh and clean.

That is why we call negative ions the air's vitamins. An increasing number of researchers see a positive relationship between the number of negative ions and an increase in the oxygen absorption capacity.

Competing products

Comparison between the most common air purification methods and how they operate in comparison with Aircode™ technology.

HEPA (High Efficiency Particulate Air) Filtration

- ☉ Pleated type filter that has proven 99.97% efficient to trap particles 0.3 microns and larger.
- ☉ Can be incorporated into central HVAC systems or used as stand alone units.
- ☉ Can not treat the source of contaminants, can only filter contaminated air from entering an area.
- ☉ Is not effective on many mold spores, bacteria and viruses.
- ☉ Will restrict air flow when incorporated into central systems and increase energy costs.
- ☉ Requires several maintenance visits to replace used filters each year.

UV (Ultra-Violet light) Purification

- ☉ Disinfects by passing air through ultra-violet light.
- ☉ Can be incorporated into central HVAC systems or used as stand alone units.
- ☉ UV light can only treat contaminants that pass directly through the light field. Ambient air that does not enter through the light field will not be affected.
- ☉ UV is dependant on contaminants being exposed to the light field for a time period long enough for the contaminant to be treated.
- ☉ UV is dangerous when exposed to humans.
- ☉ Will not restrict air flow when incorporated into central systems.
- ☉ Requires maintenance each year to replace worn bulbs.

“Needlepoint” Ionization

- ☉ Creates single polarity ionization to attract particles.
- ☉ The single polarity will use walls or any nearby surface as the needed opposite polarity. This will attract the charged particles to that surface, producing “black or dirty walls”.
- ☉ Will only work in a small area around the unit.
- ☉ Uses high energy (25,000 to 40,000 volts) to produce ions.
- ☉ Mostly ineffective against bacteria, spores and VOC compounds.
- ☉ Creates uncontrollable positive ion output – coupled with high energy output will create ozone.
- ☉ Will interfere with radio equipment, etc.
- ☉ Can not be incorporated into central HVAC systems.

“Dust Collectors”

- ☉ Examples of these units are the many “stick style” portable units.
- ☉ Will collect particles on a metal surface contained in the unit and produces single polarity ions by electrifying collector plates. • Only effective inches from the unit.
- ☉ Will create ozone. • Ineffective against bacteria, spores and VOC compounds.
- ☉ Cannot be incorporated into central HVAC systems.

The Aircode™ System

- ☉ Disinfects air by producing and distributing a controlled amount of positive and negative ions which restore oxygen molecules to an active state.

- By controlling positive ion output and using low energy (2,200 to 3,000 volts) ozone is not produced.
- Effective against bacteria, mold spores, VOC compounds and particles.
- Can treat the source of contamination.
- Can be incorporated into central HVAC systems or used as stand alone units.
- Will not restrict air flow when incorporated into central systems.
- Requires maintenance each year to replace worn tubes.

| | Hepa Air Filters | Ultra Violet Light | Needle Point Ionization | "Dust Collectors" | Aircode™ |
|-------------------------------------|------------------|--------------------|-------------------------|-------------------|----------|
| Both portable and in-duct systems | ✓ | ✓ | | | ✓ |
| Entire building purification | | | | | ✓ |
| Will not restrict HVAC airflow | | ✓ | ✓ | ✓ | ✓ |
| Uses low energy | ✓ | | | | ✓ |
| Produces positive and negative ions | | | | | ✓ |
| Is effective on mold spores | | | | | ✓ |
| Doesn't produce ozone | ✓ | ✓ | | | ✓ |
| Is effective on particles | ✓ | | | | ✓ |
| Can treat source of contamination | | | | | ✓ |
| Will not interfere with TV or radio | ✓ | ✓ | | | ✓ |



Products for all industries and problems

Our products are available for all types of application from the smallest bedroom to the largest industrial ventilation solution. Free-standing consumer products that require only a wall socket for example in: detached houses, caravans, changing rooms etc.

We can supply free-standing decontamination units for smoke and mould clearance for example. There are also special units for waste disposal areas and environmental room solutions. We also have units for placing in ventilation systems for the following applications: purification plants, industries, commercial buildings, paint-spraying work shops, day care centres, schools, care homes, restaurants, static electricity treatment, clean rooms etc. Exhaust air systems deal with odours, gases etc and are tailored fully to meet customer requirements.

We imitate nature's own way of purifying air and the criterion for a healthy environment is a large ion concentration. Our products control the ion concentration without chemicals or additives and results in clean, healthy air and no airborne particles.

Installations at home and offices

Aircode™ CX-100

| | |
|---------------------|--|
| Location: | Wall or roof |
| Voltage: | 110-120 V / 220 - 230 V, 50 Hz |
| Size of pipe: | 35 |
| Number of pipes: | 1 |
| Energy consumption: | 35 watts |
| Weight: | 5 kg |
| Applications: | Waste, medical care, schools, offices, HORECA etc. |



Aircode™ RX-100

| | |
|---------------------|--|
| Location: | Anywhere in a room |
| Voltage: | 110-120 V / 220 - 230 V, 50 Hz, Sec: 12 V |
| Size of pipe: | 6 |
| Number of pipes: | 1 |
| Energy consumption: | 10 watts |
| Weight: | 0,5 kg |
| Applications: | Mobile unit for offices, classrooms, busses, toilets, restaurants, day care centres, salons, the home etc. |



Installations in industry

Our industry installations are always adapted to the specific requirements of each customer. In most cases we purify the indoor environment to remove pollutants and the result is that the exhaust air also becomes clean. We install units in large industries and quantify the problems before and after installation to achieve maximum effect in our systems.

A significant additional effect of our installations is usually the number of air changes per minute. In difficult environments this is often a case of 15 air changes per hour. When using our equipment, we recommend no more than 5-6 air changes per hour. Today, the reduced energy consumption is a major savings that is seen directly on the bottom line. The result is usually better air at lower operating costs. Our operating costs compare favourably with other purification methods. As a rule, we incur only half the previous service cost per annum to maintain the high air quality delivered by Aircode installations.

Aircode™ ID AC-535 / ID AC-550

| | |
|---------------------|---|
| Location: | In the ventilation system |
| Voltage: | 110-120 V / 220 - 230 V, 50 Hz |
| Size of pipe: | 35, 50 |
| Number of pipes: | 1-5 |
| Energy consumption: | 35 watts |
| Weight: | 7,2 kg |
| Applications: | Purification plant, hospitals, factories, offices, clean rooms, properties etc. |



Aircode™ CX-600

| | |
|---------------------|--|
| Location: | Anywhere in a room |
| Voltage: | 110-120 V / 220 - 230 V, 50 Hz |
| Size of pipe: | 35 |
| Number of pipes: | 5 |
| Energy consumption: | 50 watts |
| Weight: | 11 kg |
| Applications: | Smoke, smells, virus inactivation and mould decontamination etc. |

