



Introduction

How Does Ozone Clean Air?

Ozone is in the air around us all the time. It occurs naturally in the environment and is simply activated oxygen – think of the fresh smell following a thunderstorm and that's ozone.

Ozone works as a natural cleaner. When it comes into contact with an odour (a volatile organic compound) a chemical reaction takes place and the odour oxidises into a harmless, non-odorous substance.

It is not a masking process – the smells are permanently removed.

Ozone also works as a natural sanitising agent. It kills most bacteria, pathogens and neutralizes viruses, including E-coli, MRSA, and SAR-2 leaving treated areas hygienically clean.

Improving Infection Control

Preventing Nosocomial Infections

A successful infection control program can not only help reduce mortality and morbidity rates in care facilities but can also be very cost-effective for health care organisations, hotels, food services etc... Considering that one third of all nosocomial infections are preventable, prevention and control measures need to be a priority for any organisation.

To fight infections/ breakouts which occur, an approach using various integrated prevention measures is considered the most effective. This includes such measures as good hygiene practices by all employees, invasive medical devices free from contamination, therapy pool disinfectant programmes, and continuous disinfecting of rooms and equipment throughout the facility.

Disinfecting means the use of a chemical procedure to eliminate virtually all recognised pathogenic microorganisms but not necessarily all microbial forms on inanimate objects. Antimicrobials such as iodine, chlorhexidine, 70% isopropyl alcohol solution, and hexachlorophene are frequently used in hospitals and other facilities. Chlorhexidine and hexachlorophene are active against many microorganisms but are less effective against gram-negative bacteria.

Ozone is a powerful, broad-spectrum antimicrobial agent that has been found to be effective against bacteria, fungi, viruses, protozoa, and bacterial and fungal spores. The antimicrobial activity of ozone is based on its strong oxidizing effect, which causes damage to the fatty acids in the cell membrane.



A big problem in controlling infections is that some strains of bacteria can actually build up a resistance to certain chemical disinfectants. Ozone, on the other hand, kills bacteria within a few seconds by a process known as cell lysing. Ozone molecularly ruptures the cellular membrane, disperses the cell's cytoplasm and makes reactivation impossible. Because of this, microorganisms cannot develop ozone resistant strains, thus eliminating the need to change biocides periodically.

Because of application advantages such as this, ozone technology fits in well with other disinfectants in a combined strategy to prevent infections.

Destroying Unpleasant Odours

Ozone is a very strong oxidizer. As it oxidizes a substance ozone will literally destroy the substance's molecules.

Odour problems originate from numerous sources including bacteria, moulds, smoking, chemical fumes, cooking and pets. Odours can be a big problem when they are affixed to clothing, furniture fabrics, or carpets. Mould and fungus contamination are another major source of unpleasant odours and creates a musty, stale odour which can be both an annoyance and a health issue to those suffering from allergies or asthma.

Traditional odour removal consists of masking the odour with a less offensive odour, or removing the odour by using strong chemicals or filtering systems. However, air filters require the air in the room to be pulled through the filter and cannot remove odours embedded into clothing, furniture fabrics and carpets. Masking the unpleasant odour is only a short term solution to the problem.

When ozone comes in contact with organic compounds or bacteria, the extra atom of oxygen destroys the contaminant by oxidation. Ozone decomposes to oxygen after being used so no harmful by-products result.

Ozone will neutralise virtually all organic odours, specifically those that contain carbon as their base element. This will include all the bacteria and fungus groups as well as smoke, decay, and cooking odours.



List of Odours Destroyed By Ozone

Organic odours and pollutants controlled by ozone and chemical reactions

Acetaldehyde	Carbon Monoxide	Ethel Amine
Acetic Acid	Carbon Tetrachloride	Ethel Benzene
Acetic Anhydride	Celloosolve	Ethyl Bromide
Acetone	Cellosolve Acetate	Ethyl Chloride
Acetylene	Charred Materials	Ethyl Ether
Acrolein	Cheese	Ethyl Formate
Acryaldehyde	Chlorine	Ethyl Mercaptan
Acrylic Acid	Chloriobenzene	Ethyl Silicate
Acrylonitrile	Chlorobutadiene	Ethylene
Adhesives	Chloro Nitropropane	Ethylene Chlorhydrin
Aged Manuscripts	Chloropicrin	Ethylene Dichloride
Air Wick	Cigarette Smoke	Ethylene Oxide
Alcohol	Citrus and Other Fruits	Essential Oils
Alcoholic Beverages	Coal Smoke	Eucalyptole
Amines	Combustion Odours	Exhaust Fumes
Amyl Acetate	Cooking Odours	Fabric Finishes
Amyl Alcohol	Creosote	Fecal Odours
Amyl Ether	Cresol	Fertiliser
Animal Odours	Crontonaldehyde	Film Prosessing Odours
Anesthetics	Cyclohexane	Fish Odours
Aniline	Cyclohexanol	Floral Scents
Ashpalt Fumes	Cyclohexene	Fluorotrichloromethane
Automobile Exhaust	Dead Animals	Food Aromas
Bacteria	Decane	Formaldehyde
Bathroom Smells	Decaying Substances	Formic Acid
Benzene	Decomposition Odours	Freon
Body Odours	Deodorants	Fuel Gases
Burned Flesh	Dibromomethane	Fumes
Burning Food	Dichlorobenzene	Gangrene
Burning Fat	Dichlorodifluoromethane	Garlic
Butadiene	Dichloroethane	Gasoline
Butane	Dichloroethylene	Heptane
Butanone	Dichloroethyl Ether	Heptylene
Butyl Acetate	Dichloromonofluoromethane	Hexane
Butyl Alcohol	Dichloro-Nitroethane	Hexylene
Butyl Cellosolve	Dichloropropane	Hexyne
Butyl Chloride	Dichlorotetrafluoroethane	Hospital Odours
Butyl Ether	Diesel Fumes	Household Smells
Butylene	Diethyl Amine Diethyl Ketone	Incense
Butyne	Dimethylaniline	Indole
Butyraldehyde	Dixane	Incomplete Combustion
Butyric Acid	Dipropyl Ketone	Industrial Wastes
Camphor	Embalming Odours	Iodoform
Cancer Odour	Ethane	Irritants
Caprylic Acid	Ether	Isophorone
Carbolic Acid	Ethel Acetate Ethel Acrylate	Isoprene
Carbon Dioxide	Ethel Alcohol	Isopropyl Acetate



List of Odours continued.

Isopropyl Alcohol	Nitro Benzene Nitroethane	Rancid Oils
Isopropyl Ether	Nitroglycerine	Resins
Kerosene	Nitromethane	Reodorants
Kitchen Odours	Nitropropane	Ripening Fruits Sauerkraut
Lactic Acid	Nitrotoluene	Sewer Odours
Lingering Odours	Nonane	Skatole
Liquid Fuels	Noxious Gases	Slaughtering Odours
Liquid Odours	Octylene	Smoke
Lubricating Oils and Greases	Octane	Solvents
Lysol	Odours	Sour Milk Spilled Beverages
Masking Agents	Odorants	Spolied Food Stuffs
Medicinal Odours	Onions	Stale Odours
Melons	Organic Chemicals	Stoddard Solvent
Menthol	Packing House Odours	Stiffness
Mesityl Oxide	Paint & Redecorating Odours	Styrene Monomer
Methane	Palmitic Acid	Tar
Methyl Acetate	Paper Deteriorations	Tarnishing Gases
Methyl Acrylate	Paradichlorobenzene	Tetrachloroethane
Methyl Alcohol	Paste & Glue	Tetrachloroethylene
Methyl Bromide	Pentane	Tetrahydrofuran
Methyl Butyl Ketone	Pentanone	Theatrical Makeup Odours
Methyl Cellosolve	Penylene	Tobacco Smoke
Methyl Cellosolve Acetate	Perchloroethylene	Toilet Odours
Methyl Chloride	Perfumes & Cosmetics	Toluene
Methyl Chloroform	Perspiration	Toluidine
Methyl Ether	Persistent Odours	Trichloroethylene
Methyl Ethyl Ketone	Pet Odours	Turpentine
Methyl Formate	Phenol	Valeric Acid
Methyl Isobutyl Ketone	Pitch	Valeric Aldehtde
Methyl Mercaptan	Plastics	Vapours
Methylal	Popcorn & Candy	Varnish Fumes
Methylcyclohexane	Poultry Odours	Vinegar
Methylcyclohexanol	Propane	Vinyl Chloroide
Methylcylohexanone	Propionaldehyde	Viruses
Methylene Chloride	Propionic Acid	Volatile Materials
Mildew	Propyl Acetate	Waste Products
Mixed Odours	Propyl Alcohol	Waterproofing Compounds
Mold	Propyl Chloride	Wood Alcohol
Monochlorobenzene	Propyl Ether	Xylene
Monofluorotrichloromethane	Propyl Mercaptan	
Moth Balls	Propylene	
Naptha (Coal Tar)	Propyne	
Naptha (Petroleum)	Putrefying Substances	
Naphthalene	Putrescine	
Nicotine	Pyridine	

Excerpt from "Ozone", by M Horvath, L. Bilizky and J. Huttner, Budapest, Hungary, Published 1985. Distributed by Elsevier Science Publishing Co Inc, 52 Vanderbilt, Avenue, New York, NJ 10017 USA



Reduce Your Carbon Footprint

In today's eco-conscious world we all have to look at ways of reducing our carbon footprint. For business organisations the desire to act responsibly is further complicated by the need to change behaviour without compromising their profitability.

The Sanity System, which utilises the unique natural cleaning properties of ozone, will allow your business dramatically to reduce its reliance on environmentally unfriendly aerosols and sprays as well as cutting down heavily on the use of chemical cleaners and detergents.

The reduction in the usage of artificial aerosols and chemicals will cut down on manufacturing and production, equalling lower CO2 emissions and less greenhouse gases being released into the atmosphere.

The Sanity System uses the equivalent energy of a small light bulb, and with short cycle times, particularly when compared to traditional carpet shampoo machines and steam cleaners, you will save energy and therefore lower your carbon footprint.

The unique odour killing properties of ozone means you will no longer need to open windows to air a room, thus further minimising wasted energy.

Using the Sanity System, which conforms to European recycling standards, businesses can go greener without compromising the bottom line. In essence they can...

- significantly improve their cleaning processes, saving both time and money***
- whilst demonstrating to customers, staff, and shareholders that they are an environmentally responsible company.***



SANY-CAR

Ozone – What is it and how it works.

Ozone is an unstable and colourless GAS composed of trivalent oxygen (O₃) that is found in nature. It's in the atmosphere for irradiation of the solar ultraviolet rays, or through the electrical charges produced during storms. It is present in the mountains in greater concentrations and that's what gives us a freshness and pure air perception.

Ozone is a natural GAS with a very high oxidant power, with the peculiarity of dissolving without leaving traces or chemical residuals. Its high oxidant power and its natural tendency to convert back to oxygen (O₂), make it a GAS with high properties of use in many applications for the treatment of air and water.

Its particular instability doesn't allow it to be stored and as a consequence it has to be produced in the place where it is used without people or animals around.

The Sanity System ozone generators are provided with the "Safe System. This system allows the conversion of residual ozone back to oxygen in a very short time frame making it safe for you to go back into the place of sanitization.

The Sany-CAR unit was designed for air purification and sanitizing of surfaces of small dimensions, with a max volume of 500 sq. ft. or 50m³

The ozone generator SANY-CAR guarantees a complete inactivation of all the micro-organisms, the removal of toxic, noxious, organic, and inorganic residues in the air and on surfaces, removing as a consequence any pre-existing smells.

- It doesn't leave residue and drastically reduces the use of chemical products.
- It doesn't damage the materials of the environments and it doesn't stain fabric.
- It takes few minutes to sanitize a small area
- Maximum penetration capacity: It also sanitizes the most difficult to reach surfaces.



IMPORTANT SAFETY INSTRUCTIONS

Read the following safety instructions carefully:

- Read this instruction manual before using the **SANY-CAR** unit.
- The **SANY-CAR** ozone generator must only be used for the sanitation of interiors, in compliance with the provisions described herein.
- Ensure that the power socket is protected upstream by an automatic circuit breaker switch
- Connect the unit to an earthed power socket.
- Ensure that the power lead does not touch any wet floors or surfaces.
- To prevent risk of electric shock, always turn the power off before working on the unit.
- **SANY-CAR does not work when the temperature is higher than 38°C.**
- The ozone sanitation cycle must only be used **WITH NOBODY PRESENT IN THE IMMEDIATE VICINITY**. The level of ozone that can be reached could be higher than the legally allowed limit and have a harmful effect on people.
- Avoid exposure to UV rays produced by fluorescent lamps, which could burn the eyes. Do not place any tools or other items inside the ventilation grids. The unit is fitted with protective safety grids **WHICH MUST NEVER BE FORCED OR REMOVED**.
- Never leave the unit outside, **SANY-CAR** has been designed for use inside small rooms.
- Never cover the ventilation grids on the sides of the unit (reduced ventilation could damage the internal mechanical parts).
- Store the unit in a dry place.
- Never dismantle the ozone generator, as mechanical damage could be caused.
- Never use the unit with wet or damp hands.
- Never use the unit in the vicinity of flammable substances, such as alcohol, benzene, hydrocarbons, etc.
- **Always use the correct programme for the correct room size, failure to do so may result in excess ozone not being converted back to oxygen**

SANY-CAR

1. HOW THE UNIT WORKS

The **SANY-CAR** unit has been designed to purify the air and sanitise the surfaces of cars, ambulances, campervans to a max. of 50 m³.

SANY-car is equipped with an ozone sanitation system.

1.1. OZONE SANITATION SYSTEM

The **SANY-CAR** ozone generator is equipped with an automatic control unit that governs the sanitation cycle with 3 programs: **SHORT, MEDIUM, LONG**.

There are 4 buttons on the top of the unit casing, 3 are for program selection and 1 is the unit ON-OFF button.

If the room temperature is higher than 38 °C, the unit will not produce ozone. The room temperature must be reduced.

A **lighted red led** on the top of the casing shows the unit is switched on. During this cycle, the unit produces small amounts of ozone to sanitise the air, surfaces and the air conditioning system in the room. In fact, ozone is ideal to eliminate unpleasant smells caused by bacteria, fungi, mould, etc.



THE SANITATION CYCLE MUST ONLY BE OPERATED WITH NOBODY PRESENT IN THE IMMEDIATE VICINITY.

The unit produces ozone by means of corona discharge generators. The air inside the room is moved by the recirculation fan, passes through the unit where it is enriched with ozone, and at the end of the ozone phase the catalysis phase begins, when the remaining ozone passes through the UV-C lamps and is converted back into oxygen, without leaving any traces.

Signals during the cycle: Red LED on.

Signals when cycle completed: Red LED off and "CYCLE COMPLETED" displayed on the machine.

1.2. NOTES ON OZONE

Ozone (O₃) is a natural gas formed of trivalent oxygen. It is formed in nature during thunderstorms by the electric charges in lightning and in the atmosphere by ultraviolet sunrays.

There are higher concentrations in the mountains, which is why we feel better there and where the air is cleaner.

It is a colourless gas with a sharp and penetrating smell.

Ozone has a molecular weight of 48 g/mol; at a pressure of 1 atm it has a melting point of 192.5 °C and a boiling point of 111.9 °C.

Its high reactivity level and spontaneous decomposition with oxygen make ozone a gas with excellent potential for air purification systems.

Thanks to its high oxidising power (2.07 V), second only to fluoride, it is extremely effective in reducing or inactivating bacteria, mould, yeast, parasites and viruses. Ozone acts by means of an oxidising mechanism and attacks both glycoproteins.

INSTALLING, HANDLING, STARTING AND PROGRAMMING THE UNIT

2.1. WHERE TO USE

Air purification and sanitation of the surfaces in small and medium size rooms up to a max. of 80 m³.

Mounting and starting instructions

1. Connect the power lead supplied with the unit (on the right hand side) to the power socket.
2. Turn on the ON-OFF switch to pos. 1
3. Select the program (**1SHORT – 2 MEDIUM – 3 LONG**)
4. Press the START button to begin the sanitation program (the red LED remains alight throughout the treatment)
5. When the sanitation cycle is complete, the unit turns off automatically but remains powered, turn the ON-OFF switch to pos. 0 to turn it off completely.
6. **Always use the correct program for the correct vehicle size, failure to do so may result in excess ozone not being converted back to oxygen**



2.2. PROGRAMMING

PROG. 1 SHORT ROOM (CAR) DURATION 22 MIN.

PROG. 2 MEDIUM ROOM (Ambulance) DURATION 29 MIN.

PROG. 3 LONG ROOM (Campervan) DURATION 44 MIN.

N.B. These recommended times may vary in the case of very old interiors or precarious hygienic situations, and therefore the cycle duration should be increased.

N.B. Never enter the site being treated during the function cycle, and if possible aerate the rooms before using them.

Attention: inhaling high concentrations of ozone and over a long time can irritate the nose and throat. Keep the unit out of the reach of children.

2.3. HANDLING AND TRANSPORT

The unit must be handled with care, avoiding knocks that could damage the internal components. It should be carried in its own special case.

2.4 WORKING AND STORAGE CONDITIONS

The unit must be used inside with a room temperature between +4 and +38 °C and a maximum relative humidity of 90%.

2.5. CONNECTION TO THE POWER SUPPLY

After positioning the unit, connect the supplied power lead to the power socket. Ensure that the power socket is protected upstream by an automatic circuit breaker switch.

TECHNICAL DATA

3.1. SANY-CAR UNIT TECHNICAL DATA

Technical data:

Structure: AISI 430 STEEL

Ozone production: CORONA DISCHARGE SYSTEM at ≈ 1 grh

Abatement equipment ozone: present.

Power: 110/250 V – 50/60 Hz

Installed output: 50 W max

Insulation class IP41

Fuse: A 2

Measurements: W30xD12xH22

Weight: 3,5 kg

Max. treated volume: 50 m³

Working temperature: +4°C / +38°C – Max. relative humidity 90%



REFERENCE LEGISLATION

The SANY-CAR unit is manufactured in accordance with the following legislation:

Directive 2006/95/EEC and subsequent amendments and integrations.

Directive 2004/108/EEC and subsequent amendments and integrations.

Directive 2011/65/EEC and subsequent amendments and integrations.

Directive 81/2008/EEC safety in the workplace.

UNIT MAINTENANCE

4.1. PERIODIC MAINTENANCE

Only qualified and authorised SANITY SYSTEMS or appointed technicians must carry out the operations to find any faults and to replace any parts, otherwise the product guarantee will no longer be valid.

The user may only carry out these operations further to written authorisation from SANITY SYSTEM. The customer must always contact SANITY SYSTEMS when the hour meter reaches 1500 cycles to arrange servicing.

GUARANTEE

The guarantee only covers units supplied by SANITY SYSTEM INTERNATIONAL, covering any parts that are found faulty within 12 months from the date of purchase or rental start date, providing the replacement or repair of these through the company's service network. SANITY SYSTEM will only respond for the components that are covered by the guarantee if the periodic cleaning and maintenance operations have been carried out in accordance with this manual.

N.B. Only use spare parts that have been authorised by SANITY SYSTEM ITALIA Srl, as the use of any authorised parts will mean the guarantee is no longer valid. All the replaced parts must be returned to SANITY SYSTEM ITALIA Srl for the guarantee to be valid.

THE GUARANTEE IS NOT VALID IN THE FOLLOWING CASES:

Repairs or replacements of parts due to faulty installation, incorrect maintenance, incorrect working conditions, mistreatment, mishandling, negligence, accidents, fires, floods, repairs with unauthorised materials and accessories.

SANITY SYSTEM Limited is never responsible for any improper use of its products, for lost income, direct or indirect damage caused by damage and/or accidents involving its products.

This guarantee provides precise rights for the customer; other rights may vary depending on the country of use.

Extensions to the guarantee and special service agreements can be arranged.



SAFETY

6.1. PERCEPTION LEVELS

Ozone can be perceived in the air by its typical sharp smell at concentrations of 0.02 ppm. Everyone has a different smell perception level and therefore do not rely on the perceived smell to evaluate a high concentration of ozone.

The allowed exposure level for 8 working hours is 0.05 ppm (ACGIH-USA). The exposure level at 0.3 ppm is reduced to 15 minutes. A concentration of 10 ppm of ozone in the air is recognised as being dangerous for health and even life (DLH).

6.2. EFFECTS ON PEOPLE

Ozone is an irritant, mainly affecting the eyes, respiratory apparatus and the lungs. A pulmonary oedema may occur after just a few hours of exposure. Inhaling ozone at high concentrations of 50 ppm for 30 minutes can be fatal. Many people who are exposed to induced ozone in the air quickly develop a headache, but this always disappears after a few minutes breathing fresh air. A reduction of lung functions due to scarring formation on the tissues can be due to lengthy exposure in environments with a concentration of 0.02 ppm or due to a single exposure to high ozone concentrations. Owners of ozone generating equipment must inform all those people who could be

exposed to the ozone, and anybody who has history of respiratory illnesses, to ensure that they take the necessary precautions to avoid exposure.

6.3 FIRST AID

If the exposure to ozone causes a headache, cephalgia or lack of breath, immediately take the patient outside into fresh uncontaminated air.

People who have suffered exposure to low ozone concentrations may be oxygenated under the supervision of trained personnel, however if the exposure is more serious immediately call for medical assistance.

6.4. INHALATION

Check the patient's breathing. If the patient is unconscious, he/she must be placed in the correct position to enable removing any secretions for their airway without injuring them, check their pulse, if they have stopped breathing provide artificial respiration until they begin breathing again naturally and immediately call for medical assistance. If there is no heartbeat begin cardiac massage.

6.5. EYE CONTACT

Immediately rinse the eyes with drinking water, with a few mineral salts added if preferable, for at least 30 minutes; continue rinsing the eyes until the patient reaches the hospital.

PRECAUTIONS

Any personnel subject to cardiac-pulmonary problems must consult their doctor before working anywhere that has a risk of exposure to ozone. Significant alterations to the cardiac-pulmonary functions can occur even when people are exposed to low concentrations of ozone.



WARNING: IT IS FORBIDDEN TO STAY IN THE ROOMS DURING OZONE TREATMENT.

Training Check Sheets

Item	Initials
1. I have completely read and fully understood the SaniMed operation manual. Any points not understood have been explained to my complete satisfaction.	
2. I understand that the SaniMed must only be used in strict accordance with the operations manual.	
3. I understand that it is essential that the room size and treatment time be carefully selected on the SaniMed control panel and that selecting a larger room size or longer time than is necessary will not provide any additional benefit.	
4. I understand that the SaniMed can produce high concentrations of Ozone and that any room or space to be treated must be <u>unoccupied throughout the entirety of the treatment cycle.</u>	
5. I understand that all animals, pets etc must be removed from the room throughout the entirety of the treatment cycle. Fish Tanks and Aquariums must also be removed or covered over.	
6. I understand that plants and flowers must be removed from the room throughout the entirety of the treatment cycle.	
7. I understand that it is essential to prevent accidental access to the area being treated for the duration of the treatment cycle. Accordingly, I understand that rooms should be locked to prevent access during treatment, and that a sign must be affixed to the entrance door(s) warning against entry, showing clearly when the treatment started, when the treatment is due to finish, and who is responsible for the use of the SaniMed	
8. I understand that the SaniMed user Manual provides clear instruction regarding periodic maintenance every 1500 cycles. I understand that aside from these instructions there are no other user serviceable parts within the system.	
9. I understand that if there is any doubt about the safe or correct operation of the SaniMed, I should contact Sanity System IRL & UK Limited for guidance <u>before</u> using the system.	
Name and Company Address of Certified User	Signature _____ Date _____
	Signature _____ Date _____

