

ANSEROS INDUSTRIAL OZONE SOLUTIONS

SAUNA & SPA



ANSEROS

Recycling the life

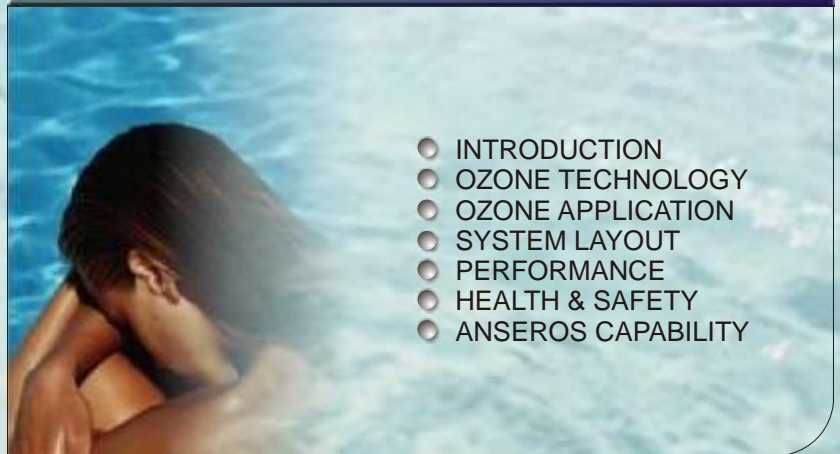
● INTRODUCTION

When most people think of ozone, they picture a thin layer of gas high above the earth's outermost atmosphere that protects us from the sun's ultraviolet rays. But this bluish gas, which sometimes is described as that "fresh smell" after a thunderstorm, has a variety of down-to earth uses. Ozone is a gas. And it's made of just one thing "oxygen".

Ozone can be visualized as a regular O₂ molecule with a very nervous, active, reactive, excitable, energetic, and lively O₁ atom as a side kick. This monatomic O₁ atom does not like to be alone, and near the earth's surface, it refuses to stay with the stable O₂ double bond. It is active and reactive, with energy needing to be channeled in some useful direction. It will combine with virtually anything on contact, or at least will try. This active O₁ will not stabilize until it can break away from the O₂ and form a stable molecule with something else, virtually any other molecule that is available. If no other molecule is available, it will eventually unite with another O₁ atom in the same situation, and restabilize as O₂. "Ozone is simply a gas composed of three oxygen atoms. It's an extraordinary sanitizing agent that's economically produced and remarkably effective in applications such as food processing and equipment cleaning/sanitizing. Today, ozone technology is steadily replacing conventional sanitation techniques such as chlorine, steam or hot water.

Growing consumer awareness and increasingly stringent regulatory demands have resulted in renewed emphasis on the quality of water used for the production of semiconductors, pharmaceuticals, water for human consumption and many more. To achieve these new standards of quality, improved technology must be utilized to provide water free from all bacteria and organics and to maintain water systems free from bacteria and biofilms without risk of disinfection products affecting the quality of the product. The technology to achieve these requirements is ozonation, the treatment of water with ozone gas.

SOLUTIONS FOR SAUNA & SPA AREAS



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● OZONE TECHNOLOGY

Disinfection is a critical operating factor for sauna and spas areas, as the high ratio of people to low volumes of water combined with warm temperatures mean they are particularly susceptible to the proliferation of bacteria. Chlorine is the traditional method of disinfection, but when it reacts with organic material deposited in the spa by bathers, by-products are produced creating the 'swimming pool' smell and, more seriously, a health risk by ingestion, inhalation or absorption.

By implementing the ozone technology we can minimize the risk of toxication. With ozone treatment we can recycle and sterilize water without having any by-products or chemicals. Ozone is a highly reactive form of oxygen which is produced electrically using electrical energy. Produced from ambient air or on larger systems, pure oxygen, ozone rapidly destroys all bacteria, algae and viruses in water or air. With a half life of 10 - 40 minutes ozone reverts naturally to molecular oxygen leaving no residual toxin or taint. Ozone can be readily measured in air or water using manual test procedures or continuous monitoring instruments.

● OZONE APPLICATION

Ozone technology can be used in wide range of pools and sauna applications. Prime use in the recycling of the water. Ozone treatment effectively eliminate almost 99% germs, micro-biologicals and bio-chemicals. There is no need to drain water because ozone treatet the waste water virtually to a level of fountain fresh, and surely this cut down the overheads as well.

A typical Anseros system PAP-MOBILE can used in remote and proxy operations of water treatment in sauna and spa area.

(Note: plesae ask for details about ANSEROS SYSTEM PAP)

● SYSTEM LAYOUT

The use of ozonated water in sauna and spa areas ensures that primses will be fully sterile. Any residues of cleaning agents, detergents, dust or debris are fully removed to ensure a sterile pool that will not impair the taste or quality of the final product. Ozone is a more than 50% stronger oxidizer and acts over 3,000 times faster as compair to other water disinfectant chemicals.

Below is the list of common bacterias, microbiological and germs effectively terminated by ozone application:

BACTERIA Achromobacter butyri NCI-9404 Aeromonas harveyi NC-2 Aeromonas salmonicida NC-1102 Bacillus anthracis Bacillus cereus B. coagulans Bacillus globigii Bacillus licheniformis Bacillus megatherium sp. Bacillus paratyphosus B. prodigiosus Bacillus subtilis B. stearothermophilus Clostridium botulinum C. sporogenes Clostridium tetoni Cryptosporidium Coliphage Corynebacterium diphthriae Eberthella typhosa Endamoeba histolyca Escherichia coli Escherichia coli Flavobacterium SP A-3 Leptospira canicola Listeria Micrococcus candidus Micrococcus caseolyticus KM-15 Micrococcus sphaeroideis Mycobacterium leprae Mycobacterium tuberculosis Neisseria catarrhalis Phytomonas tumefaciens Proteus vulgaris Pseudomonas aeruginosa Pseudomonas fluorescens (biofilms) Pseudomonas putida	Salmonella choleraesuis Salmonella enteritidis Salmonella typhimurium Salmonella typhosa Salmonella paratyphi Sarcina lutea Seratia marcescens Shigella dysenteriae Shigella flexnaria Shigella paradyserientiae Spirillum rubrum Staphylococcus albus Staphylococcus aureus Streptococcus 'C' Streptococcus faecalis Streptococcus hemolyticus Streptococcus lactis Streptococcus salivarius Streptococcus viridans Torula rubra Vibrio alginolyticus & anguillarum Vibrio cholerae Vibrio comma Virrio ichthyodermis NC-407 V. Parahaemolyticus	Legionella pneumophila Polio virus (Poliomyelitus) 1, 2 & 3 Rotavirus Tobacco mosaic Vesicular Stomatitis	FUNGAL PATHONGENS Alternaria solani Botrytis cinerea Fusarium oxysporum Monilia fruticola Monilia laxa Pythium ultimum Phytophthora erythroseptica Phytophthora parasitica Rhizoctonia solani Rhizopus stolonifera Sclerotium rolfsii Sclerotinia sclerotiorum
	FUNGUS & MOLD SPORES Aspergillus candidus Aspergillus flavus (yellowish-green) Aspergillus glaucus (bluish-green) Aspergillus niger (black) Aspergillus terreus, saitoi & oryzae Botrytis allii Colletotrichum lagenarium Fusarium oxysporum Grotrichum Mucor recomosus A & B (white-gray) Mucor piriformis Oospora lactis (white) Penicillium cyclopium P. chrysogenum & citrinum Penicillium digitatum (olive) Penicillium glaucum Penicillium expansum (olive) Penicillium egyptiacum Penicillium roqueforti (green) Rhizopus nigricans (black) Rhizopus stolonifer		YEAST Baker's yeast Candida albicans-all forms Common yeast cake saccharomyces cerevisiae saccharomyces ellipsoideus saccharomyces sp.
	VIRUS Adenovirus (type 7a) Bacteriophage (E.coli) Coxackie A9, B3, & B5 Cryptosporidium Echovirus 1, 5, 12, &29 Encephalomyocarditis Hepatitis A HIV GD V11 Virus Infectious hepatitis Influenza	PROTOZOA Paramecium Nematode eggs Chlorella vulgaris (Algae) All Pathogenic and Non-pathogenic forms of Protozoa	CYSTS Cryptosporidium parvum Giardia lamblia Giardia muris
			ALGAE Chlorella vulgaris Thamnidium Trichoderma viride Verticillium albo-atrum Verticillium dahliae

● PERFORMANCE

Ozone is the most powerful broad spectrum microbiological and contamination control agent available.

Ozone **ELIMINATES** the use of hot water and conventional sanitizer.

Ozone virtually eliminates all chemical usage.

Ozone is chemical-free; it produces **NO** toxic by-products.

Ozone is clean and environment-friendly; its only by-product is oxygen.

Ozone is extremely effective as a disinfectant at relatively low concentrations.

Ozone is generated on site eliminating the transporting, storing and handling of hazardous materials.

Ozone is very inexpensive to produce and has an unlimited supply.

Ozone is much safer for employees than any conventional chemicals.

Ozone permits recycling of wastewater.

Ozone reduces Biological Oxygen Demand (BOD)



● HEALTH & SAFETY

The use of ozone in industrial processes has increased significantly in recent years. Ozone is an extremely powerful oxidant, yet it does not harm the environment or leave behind toxic by-products. Ozone has a short half-life (10-20 minutes in water) and breaks down to natural oxygen so it easily be discharged into the environment without any risk. Process ozone levels must be accurately monitored in order to ensure reliable and efficient process control. In addition, since ozone is toxic above certain concentration levels, worker exposure to ambient ozone must be carefully monitored in order to meet OSHA/TLV requirements.



TLV-TWA Threshold Limit Value-Time Weighted Average	0.1 ppmv	The maximum continuous ozone concentration to which an individual can be exposed during a normal 8 hour day / 40 hour work week without adverse effects.
TLV-STEL Threshold Limit Value-Short-Term Exposure Limit	0.3 ppmv	The maximum intermittent ozone concentration to which an individual can be exposed (provided that TLV-TWA is not exceeded) for no longer than 15 minutes and no more than 4 times per day (with at least 1 hour between exposures.)

● ANSEROS CAPABILITY

As a major concern in ozone oxidation technologies we can provide the whole solutions for air and water purification. We can develop a whole range of system for spa and saunas. As specialists in the field of ozone technology, Anseros have a wide experience in the research, design and installation of ozonation systems to suit client's specific requirements. If you have some specific or case sensitive requirement then feel free to contact our R&D department or either see ANSEROS APPLICATION NOTES.



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