



## WATER INFUSED OZONE GENERATOR

*An essential and affordable device with a multitude of beneficial advantages*



### TRI-X3 PRODUCT EVALUATION INFORMATION

**SAFETY** *Water Infused Ozone* is completely safe as Ozone has an exceptionally high dissolution rate in water. Ozone generators which produce ozone gas should be avoided.

**SAFE USAGE ASSURANCE**

Healthy cells have antioxidant enzymes in their cell membranes, such as superoxide dismutase, catalase, glutathione and peroxidase. There are also antioxidants such as vitamin C and vitamin E present in the extracellular matrix fluids and plasma. These antioxidants create a protective barrier against ozone oxidation.

1

# 2

## INSTALLATION

The TRI-X3 Ozone Infuser can be installed in about 15 minutes. Anyone capable of removing and replacing a faucet aerator can install the TRI-X3 Ozone Infuser.

- The unit is mounted on a wall close to a hand wash basin. Three Mounting options are provided.
- The faucet aerator is removed and replaced with our custom aerator which has a Venturi fitting to enable the micro-processor to detect the flow of water which activates the ozone generator.
- The silicon tube supplied is then routed between the new aerator and the TRI-X3 ozone infuser. Self adhesive tube mounts are supplied.
- Following the installation, the ozone infuser's UL listed power adaptor can be plugged-in and the Ozone Infuser switched on.
- Ozone infused water is only generated when a faucet is opened and shuts off automatically when a faucet is closed.
- 5 LEDs change color from Red to Yellow to provide a visual indication that ozone infused water is being produced.

# 3

## HAND WASHING

The importance of hand washing in medical practices cannot be overstated. The World Health Organization (WHO) and the Center of Disease Control (CDC) stress the importance of proper hand washing.

- 10 Second hand wash will reduce Clostridium Difficile by 99.9040 %
- 10 Second hand wash will reduce Eschherichia Coli by 99.9995%
- 10 Second hand wash will reduce Salmonella Thyphimurium by 99.982%
- 10 Second hand wash will reduce Staphylococcus Aureus by 99.985 %

*The above is an example of tests conducted by the Bodycote Testing Group*

# 4

## WHY IS OZONE BETTER THAN ANYTHING ELSE

Ozone disinfects by directly oxidizing and destroying the cell wall of a pathogen. Ozone is by far the most powerful and safest disinfectant.

The Lethality Coefficient of Ozone compared to Chlorine in 500:20 for Enteric Bacteria. This means that Ozone is 25 times more powerful and acts 3,000 faster than chlorine.

Ozone is the strongest of all molecules available for disinfection in water treatment and is second to only to elemental fluorine in oxidizing power.

- **OZONE** is the most powerful broad-spectrum microbiological control agent available.
- **OZONE** eliminates chemical usage.
- **OZONE** is clean and environment friendly its only by-product is oxygen.
- **OZONE** only lasts for 20 minutes. This is a significant advantage as all other disinfectant and sanitizers retain their chemical composition.
- **OZONE** offers REAL PROTECTION as pathogens often mutate to resist disinfection and sterilization. Due to the oxidation power of ozone there is no mechanism for pathogens such as norovirus to create immunity to ozone as with other chemical disinfectants and biocides.
- **OZONE** is effective against MRSA.

5

### **DISINFECTION OF SURGICAL INSTRUMENTS**

Surgical instruments that cannot be disposed of such as extracting forceps, probes, osteotomes, retractors and so on, can be rinsed with ozone infused water to eliminate pathogen contamination.

Surgical tables and chairs can be wiped down with ozone to eliminate bacteria, fungus and mold

6

### **THE IMPORTANCE OF HAND HYGIENE**

Rinsing your hands with ozone infused water reduces the risk of transmitting bacteria and viruses to and from patients

Bacterial infection can be acquired after doing simple tasks such as;

- Patient contact
- Taking blood pressure or pulse rates
- Pulling a patient up in bed
- Touching a patient's hand
- Rolling patients over in bed
- Touching a patient's gown or bed sheets
- Touching equipment like bedside rails, over bed tables and IV pumps

7

### **THERE ARE NO COMPARABLE ALTERNATIVES**

**HAND SANITIZERS** – The CDC (Center for Disease Control) issued a report reducing the affectivity of alcohol based hand sanitizers which do not eliminate common germs such as salmonella, e-coli and norovirus.

**CHLORINE** – The EPA (U.S. Environmental Protection Agency) are closely monitoring chlorine's carcinogenic by-products.(such as trihalomethanes or dioxins) that are produced when chlorine reacts with the organic matter found in water.

8

### **TRI-X3 SPECIFICATIONS**

- Micro-processor controlled automatic activation system.
- 5 Adjustable ozone concentration levels.
- LED visual indication of ozone production.
- Power Requirement - DC 12 volts
- Power Consumption – 6W
- Net Weight 380g
- Ozone Production – 50 to 150 mg/h
- Safety Device – 10 minute automatic power down. (Applies if a faucet is accidentally left running)

9

### **SAFETY AND ECONOMICS**

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

The ability to discard pure water without chemical contamination is a great advantage..

The accumulated cost of less effective chemical sanitizers represents a substantial saving.

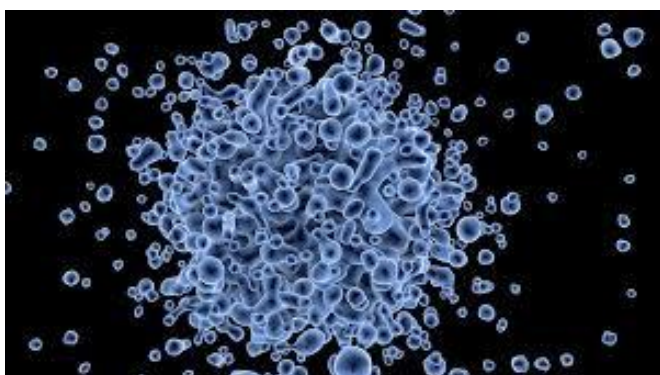
Ozone is generated on site eliminating the transportation, storing and handling of hazardous materials.

# ***OZONE FOR DISINFECTION AND INACTIVATION OF PATHOGENS***

## ***VIRUSES***

Ozone destroys viruses by diffusing through the protein coat into the nucleic acid core, where it damages viral RNA. At higher concentrations, ozone destroys the virus' exterior protein shell so that DNA or RNA structures are affected.

## ***VIRUSES SUSCEPTIBLE TO OZONE***



- Adenovirus (type 7a)
- Coxsackie's viruses A9, B3 & B5
- Cryptosporidium
- Echovirus 1, 5, 12 & 29
- Encephalomyocarditis
- Hepatitis A
- GD V11 Virus
- Infectious hepatitis
- Influenza
- Norovirus
- Rotavirus
- Tobacco mosaic
- Vesicular Stomatitis
- Legionella pneumophila
- Poliomyelitis virus 1, 2 & 3

## ***BACTERIA***

Ozone interferes with bacterial cell metabolism, probably by inhibiting the enzymatic control system. A sufficient amount of ozone breaks through the cell membrane, destroying the bacteria.

## ***BACTERIA SUSCEPTIBLE TO OZONE***

1. *Aeromonas harveyi* NC-2,
2. *Aeromonas salmonicida* NC-1102
3. *Bacillus anthracis*,
4. *Bacillus cereus*,
5. *Bacillus coagulans*,
6. *Bacillus globigii*,
7. *Bacillus licheniformis*,
8. *Bacillus megatherium* sp.
9. *Bacillus paratyphosus*,
10. *Bacillus prodigiosus*,
11. *Bacillus subtilis*,
12. *Bacillus*
13. *Stearothermophilus*
14. *Clostridium botulinum*,
15. *Clostridium sporogenes*,
16. *Clostridium tetoni*
17. *Cryptosporidium*
18. *Coliphage*
19. *Corynebacterium*
20. *Diphthriae*
21. *Eberthella typhosa*
22. *Endamoeba histolica*
23. *Escherichia coli*
24. *Flavobacterium* SP A-3
25. *Leptospira canicola*
26. *Listeria*
27. *Micrococcus candidus*,
28. *Micrococcus caseolyticus* KM-15,
29. *Micrococcus spharaeroides*
30. *Mycobacterium leprae*,
31. *Mycobacterium tuberculosis*
32. *Neisseria catarrhalis*
33. *Phytomonas tumefaciens*
34. *Proteus vulgaris*
35. *Pseudomonas aeruginosa*,
36. *Pseudomonas fluorescens*,
37. *Pseudomonas putida*
38. *Salmonella choleraesuis*,
39. *Salmonella enteritidis*
40. *Salmonella typhimurium*,
41. *Salmonella typhosa*,
42. *Salmonella paratyphi*
43. *Sarcina lutea*
44. *Serratia marcescens*
45. *Shigella dysenteriae*,
46. *Shigella flexnaria*
47. *Shigella paradysenteriae*
48. *Spirillum rubrum*
49. *Staphylococcus albus*,
50. *Staphylococcus aureus*
51. *Streptococcus C*,
52. *Streptococcus faecalis*,
53. *Streptococcus hemolyticus*,
54. *Streptococcus lactis*,
55. *Streptococcus salivarius*
56. *Streptococcus viridans*
57. *Torula rubra*
58. *Vibrio alginolyticus* & *angwillarum*,
59. *Vibrio cholerae*,
60. *Vibrio comma*
61. *Virrio ichthyodermis* NC-407,
62. *Virrio parahaemolyticus*

## ***FUNGUS AND MOLD***

It is believed that ozone destroys fungi and mold by diffusing through the fungal wall and into the cytoplasm, disrupting the organelles that direct cell function.

## ***FUNGUS AND MOLD SPORES SUSCEPTIBLE TO OZONE***

- Aspergillus candidus,
- Aspergillus flavus,
- Aspergillus glaucus,
- Aspergillus niger,
- Aspergillusterreus,
- Saitoi and oryzac
- Botrytis allii
- Colletotrichum lagenariu
- Fusarium oxysporum
- Grotrichum
- Mucor recomosus A & B, Mucor piriformis
- Oospora lactis
- Penicillium cyclopium, P. chrysogenum and citrinum,
- Penicillium digitatum,
- Penicilliumglaucum,
- Penicillium expansum,
- Penicillium egyptiacum,
- Penicillium roqueforti
- Rhizopus nigricans,
- Rhizopus stolonifer

## ***FUNGAL PATHOGENS***

As described above, the mechanism by which ozone kills various fungi is through the destruction of organelles in the cell's cytoplasm.

## ***FUNGAL PATHOGENS SUSCEPTIBLE TO OZONE***

- |                                 |                        |
|---------------------------------|------------------------|
| 1. Alternaria solani            | 9. Parasitica          |
| 2. Botrytis cinerea             | 10. Rhizoctonia        |
| 3. Fusarium oxysporum           | 11. Rhizopus           |
| 4. Monilinia fruiticola,        | 12. Stolonifera        |
| 5. Monilinia laxa               | 13. Sclerotium rolfsii |
| 6. Pythium ultimum              | 14. Sclerotinia        |
| 7. Phytophthora erythroseptica, | 15. Sclerotiorum       |
| 8. Phytophthora                 |                        |

## ***PROTOZOA***

The exact mechanism by which ozone kills protozoa has yet to be determined. The following table lists protozoan species susceptible to ozone.

## ***PROTOZOA SUSCEPTIBLE TO OZONE***

- |               |  |
|---------------|--|
| Paramecium    | All pathogenic and nonpathogenic forms of Protozoa |
| Nematode eggs | Chlorella vulgaris (algae)                         |

## ***CYSTS***

Parasitic cysts are of special concern in drinking water derived from surface water sources because they are unaffected by chlorine. Ozone at proper doses will destroy cysts listed in the table below.

### ***CYSTS SUSCEPTIBLE TO OZONE***

Cryptosporidium parvum

Giardia lamblia,

Giardia muris

## ***ALGAE***

Algae in drinking water supplies release organic chemicals during normal metabolic processes and after they die, these chemicals typically do not cause human illness, but do create problems of taste and odor and the potential for increased formation of trihalomethanes

### ***ALGAE SUSCEPTIBLE TO OZONE***

- Chlorella vulgaris
- Thamnidium
- Trichoderma viride
- Verticillium albo-atrum,
- Verticillium dahlia

## ***YEASTS***

Similarly to related molds and fungi, various types of yeasts may be destroyed with ozone through the same mechanism.

### ***YEASTS SUSCEPTIBLE TO OZONE***

- Baker's yeast
- Candida albicans
- Common yeast cake
- Saccharomyces cerevisiae,
- Saccharomyces ellipsoideus,
- Saccharomyces sp.

