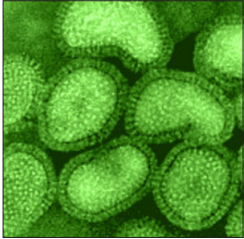


Aqueous Ozone: Summary Pathogen Kill Rates & Data

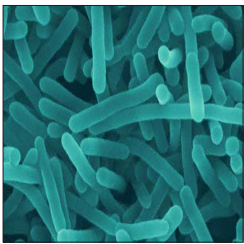
Chemical-Free Cleaning, Sanitizing & Stain Removal.

Aqueous Ozone - is approved by the EPA and FDA as a 100% natural, safe and effective cleaner and sanitizer. Its inherent ability to destroy viruses and bacteria is dependent on two main variables; Initial concentration of ozone in the water (ppm) and contact or dwell time (seconds).* The sanitizing ability of the aqueous ozone increases as either or both variable is increased. The charts below measure the power of aqueous ozone and time required to destroy bacteria and viruses at a strength of 2 ppm or greater.



Aqueous ozone kills 99.999 of common flu virus in as little as 2 seconds.

Bacteria	Reduction (%)	Dwell Time (Secs.)
Escherichia coli	99.99	5 - 13
Listeria monocytogenes	99.999	3 - 11
Salmonella typhimurium	99.99	11 - 13
Streptococcus faecalis	99.999	23 - 26
Legionella pneumophila	99.99	9 - 33
Bacillus cereus	99.9999	33



lotus PRO has a 5 log kill rate for Listeria at 2 ppm.

Viruses	Reduction (%)	Dwell Time (Secs.)
Bacteriophage F2	99.999	2 - 19
Norovirus	99.9	2
Hepatitis A	99.9	1
Poliovirus type 1	99.9	5
Rotavirus	99.99	63 - 126

Aqueous ozone is very effective as a cleaner, and with higher concentrations and longer dwell times as a sanitizer against various pathogenic molds and fungi, yeasts, pesticides, chemical residues and other common contaminants. The list below provides a brief summary:

Molds & Fungi	Algae & Yeasts	Cysts & Protozoa
Alternaria solani	Vibrio cholerae	Chloralla vulgaris
Botrytis cinerea	V. parahaemolyticus	Cryptosporidium parvum
Fusarium oxysporum	Virrio ichthyodermis	Giardia lamblia
Pythium Ultimum	Candida albicans	Giardia Muris
Rhizopus stolonifera	Saccharomyces	Nematode eggs
Sclerotium rolfsii		



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How Effective Are We?

Chemical-Free Cleaning, Sanitizing & Stain Removal.

Tersano's patented lotus PRO cleaning sanitizing system turns ordinary tap water into the world's most effective chemical-free commercial cleaner and sanitizer by infusing it with ozone. Aqueous ozone eliminates germs, odors stains, mold, mildew and other contaminants on any item or surface before changing back into water and oxygen. Leave no residues behind. Perfect for mop buckets, carpet extractors and auto scrubbers.

Kills:

- Bacillus Bacteria: *Destroyed by 0.2 mg/1 within 30 seconds*
- Bacillus Anthracis: *Causes anthrax in sheep, cattle and pigs. A human pathogen. Ozone susceptible.*
- Clostridium Bacteria: *Ozone-Susceptible.*
- Clostridium Botulinum Spores: *Its toxin paralyzes the central nervous system, being a poison multiplying in food and meals. 0.4 to 0.5 mg/1.*
- Echo Virus 29: *This virus most sensitive to ozone. After a contact time of 1 Minute at 1 mg/1 of ozone, 99.999% killed.*
- Escheriachia Coli Bacteria (from feces): *Destroyed by 0.2 mg/1 within 30 seconds.*
- Encephalomyocarditis Virus: *Destroyed to zero level in less than 30 seconds with 0.1 to 0.8 mg/1.*
- Enterovirus Virus: *Destroyed to zero level in less than 30 seconds with 0.1 to 0.8 mg/1.*
- GDVII Virus: *Destroyed to zero level in less than 30 seconds with 0.1 to 0.8 mg/1.*
- Herpes Virus: *Destroyed to zero level in less than 30 seconds with 0.1 to 0.8 mg/1.*
- Influenza Virus: *0.4 to 0.5 mg/1.*
- Poliomyelitis Virus: *Kill of 99.999% with 0.3 to 0.4 mg/1 in 3 to 4 minutes.*
- Proteus Bacteria: *Very Susceptible.*
- Pseudomonal Bacteria: *Very Susceptible.*
- Rhabdovirus Virus: *Destroyed to zero level in less than 30 seconds.*
- Salmonella Bacteria: *Very Susceptible.*
- Stomatitis Virus: *Destroyed to zero level in less than 30 seconds with 0.1 to 0.8 mg/1.*
- Streptococcus Bacteria: *Destroyed by 0.2 mg/1 within 30 seconds*
- Aspergillus Niger (black Mould): *Destroyed by 1.5 to 2 mg/1.*
- Diphtheria Pathogen: *Destroyed by 1.5 to 2 mg/1.*
- Eberth Bacillus (Typhus abdominalis): *Destroyed by 1.5 to 2 mg/1.*
- Klebs-Loffler Virus: *Destroyed by 1.5 to 2 mg/1.*
- Staphylococci: *Destroyed by 1.5 to 2 mg/1.*



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Common Organisms Killed By Ozone

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 diphthiriae
- Eberthella typhosa
- Endamoeba histolica
- Escherichia coli
- Flavorbacterium SP A-3
- Leptospira canicola
- Listeria
- Micrococcus candidus
- Micrococcus caseolyticus KM-15
- Micrococcus spharaeroides
- Mycobacterium leprae
- Mycobacterium tuberculosis
- Neisseria catarrhalis
- Phytomonas tumefaciens
- Proteus vulgaris
- Pseudomonas aeruginosa
- Pseudomonas
- fluorscens (biofilms)
- Pseudomonas putida
- Salmonella choleraesuis
- Salmonella enteritidis
- Salmonella typhimurium
- Salmonella typhosa
- Salmonella paratyphi
- Sarcina lutea
- Seratia marcescens
- Shigella dysenteriae
- Shigella flexnaria
- Shigella paradysenteriae
- Spirillum rubrum
- Staphylococcus albus
- Staphylococcus aureus
- Streptococcus 'C'
- Streptococcus faecalis
- Streptococcus hemolyticus
- Streptococcus lactis
- Streptococcus salivarius
- Streptococcus viridans
- Torula rubra
- Vibrio alginolyticus & angwillarum
- Vibrio clolarae
- Vibrio comma
- Virrio ichthyodermis NC-407
- V. parahaemolyticus



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How Effective Are We?

Common Organisms Killed By Ozone

Virus

- Adenovirus (type 7a)
- Bacteriophage (E.coli)
- Coxsackie A9, B3, & B5
- Cryptosporidium
- Echovirus 1, 5, 12, & 29
- Encephalomyocarditis
- Hepatitis A
- GD V11 Virus
- Infectious hepatitis
- Influenza
- Legionella pneumophila
- Polio virus (Poliomyelitus) 1, 2 & 3
- Rotavirus
- Tobacco mosaic
- Vesicular Stomatitis

Protozoa

- Paramecium
- Nematode eggs
- Chlorella vulgaris (Algae)
- All Pathogenic and Non-pathogenic forms of Protozoa

Fungal Pathogens

- Alternaria solani
- Botrytis cinerea
- Fusarium oxysporum
- Monilinia fruticola
- Monilinia 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.

Cysts

- Cryptosporidium parvum
- Giardia lamblia
- Giardia muris

Algae

- Chlorella vulgaris
- Thamnidium
- Trichoderma viride
- Verticillium albo-atrum
- Verticillium dahliae



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Reference

* Ref: International Ozone Association - AOAC Official method 961.02; Germicidal Spray Products as Disinfectants; and Detergent Sanitizing Action of Disinfectants. FDA GRAS Notification. EPA Organic Program compliance. Data compiled from third party independent industry and academic sources, and is for general information purpose only. Kill rates vary with temperature, surface texture, pH and other factors which are not accounted for in this document.

For more detailed kill rate data, please contact your lotus PRO Customer Representative.

Tested to meet or exceed TUV, UL and CSA standards. EPA, FDA, TURI, USDA and OSHA compliant. Exceeds GS - 37 standard.

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