PATHOGEN MATRIX

PATHOGEN	CLAIM	PPM (MG/L) / ORP	TIME (MIN)	DETAILS	SOURCE
A. niger	90%	At nozzle (0.166-0.246). Whole system (0.043-0.084)	5	N/A	http://aem.asm.org/cgi/reprint/61/9/3471
Adenovirus	99.9%	0.3	0.5	N/A	Thurston-Enriquez, Jeanette A., and THURSTONENRIQUEZ. "Inactivation of enteric adenovirus and feline calicivirus by ozone." Water research 39.15 (2005):3650-3656.
Aspergillus Flavus	99.99%	1.85 – 2.25	5	ppm is measure at nozzle	http://www.wqpmag.com/Ozone-An-Advancing-Technology-article8838 Hudson, J. B. "The Practical Application of Ozone Gas as an Anti-fungal (Anti-mold) Agent." Ozone: science and engineering 31.4 (2009):326-332.
B. Cereus	99.9%	At nozzle (0.166-0.246). Whole system (0.043-0.084	Instantaneously	N/A	http://aem.asm.org/cgi/reprint/61/9/3471
B. Megaterium	99%	0.19 µg/ml	5	In ozone demand free water	http://earthsafeozone.com/pdf_docs/Microbiological_Aspects_of_Ozone.pdf
Bacteriophage f2	99.999%	0.09 to 0.8 µg/ml	0.08	In ozone demand free water	http://earthsafeozone.com/pdf_docs/Microbiological_Aspects_of_Ozone.pdf
Bacteriophage MS2	99.9999%	0.3 to 0.4 µg/ml	0.08	In phosphate buffer	http://earthsafeozone.com/pdf_docs/Microbiological_Aspects_of_Ozone.pdf
Brettanomyces Bruxellensis	99.99%	1.85 – 2.25	3	ppm is measure at nozzle	http://www.wqpmag.com/Ozone-An-Advancing-Technology-article8838
Calicivirus	99.99%	1	0.25	given) for a 5 log reduction.	Thurston-Enriquez, Jeanette A., and THURSTONENRIQUEZ. "Inactivation of enteric adenovirus and feline calicivirus by ozone." Water research 39.15 (2005):3650-3656.
Coxsackieviruse (A9 unassociated)	100%	0.081	0.167	N/A	http://www.ncbi.nlm.nih.gov/pmc/articles/PMC241881/pdf/aem00184-0109.pdf

Coxsackie B3	99.99%	0.6	10	N/A	http://www.nap.edu/openbook.php?record_id=1904&page=45
Coxsackie B5	99.99%	0.076	10	N/A	http://www.nap.edu/openbook.php?record_id=1904&page=45
Cryptosporidium parvum	99%	1	5	ct of 5	http://www.epa.gov/OGWDW/mdbp/alternative_disinfectants_guidance.pdf
Crypt parvum	99%	1.11	4	Tested on mice	http://aem.asm.org/cgi/reprint/55/6/1519
E. coli	99.999%	At nozzle (0.166-0.246). Whole system (0.043-0.084)	Instantaneously	N/A	http://aem.asm.org/cgi/reprint/61/9/3471 http://www.nap.edu/openbook.php?record_id=1904&page=45 Tersano test results http://www.wqpmag.com/Ozone-An-Advancing-Technology-article8838 http://md1.csa.com/partners/viewrecord.php?requester=gs&collection=ENV&recid=8906304&q=author%3A%22Finch%22+intitle%3A%22Dose-response+of+Escherichia+coli+in+ozone+demand-free+...%22+&-uid=788131795&setcookie=yes http://tersanoprofessional.com/login/doc/germicidal_studies_on_aqueous_ozone.pdf
E. faecalis	99.9%	At nozzle (0.166-0.246). Whole system (0.043-0.084)	Instantaneously	N/A	http://aem.asm.org/cgi/reprint/61/9/3471
Echo 1	99.99%	0.086	10	N/A	http://www.nap.edu/openbook.php?record_id=1904&page=45
Encephalomyocarditis virus	99.99%	Approx. 0.5	0.25	In buffered water	http://www.nap.edu/openbook.php?record_id=1904&page=45
Entamoeba histolytica	98% to > 99%	0.3	5	N/A	http://www.nap.edu/openbook.php?record_id=1904&page=45
GD VII Virus	99.99%	Approx. 0.5	0.25	In buffered water	http://www.nap.edu/openbook.php?record_id=1904&page=45
Giardia cysts	99.9%	0.5	0.96 to 5.8	Time dependent of temp (<1 to 25)	http://www.epa.gov/safewater/mdbp/guidsws.pdf
Hep A	99%	0.25 µg/ml	0.02	In phosphate buffer	http://earthsafeozone.com/pdf_docs/Microbiological_Aspects_of_Ozone.pdf

L. monocytogenes	99.99%	At nozzle (0.166-0.246). Whole system (0.043-0.084)	Instantaneously	N/A	http://aem.asm.org/cgi/reprint/61/9/3471
L. pneumophila	99%	0.21 µg/ml	5	N/A	http://earthsafeozone.com/pdf_docs/Microbiological_Aspects_of_Ozone.pdf
Leuconostoc Mesenteroides	98% to 99.99%	0.3 to 3.8 µg/ml	0.5	In ozone demand free water	http://earthsafeozone.com/pdf_docs/Microbiological_Aspects_of_Ozone.pdf
Listeria monocytogenes	98% to 99.99999%	0.2 to 1.8 µg/ml	0.5	In ozone demand free water	http://earthsafeozone.com/pdf_docs/Microbiological_Aspects_of_Ozone.pdf http://www.wqpmag.com/Ozone-An-Advancing-Technology-article8838
M. Tuberculosis	99.99%	9 µg/L	Approx 4	N/A	http://www.epa.gov/OGWDW/mdbp/alternative_disinfectants_guidance.pdf http://tersanoprofessional.com/login/doc/germicidal_studies_on_aqueous_ozone.pdf
Molds (A. flavus, A, niger, A. parasiticus, and others)	Inactive	$P < 0.05$	15	In dried figs	Oeztekin, Serdar and OZTEKIN. "Effects of ozone treatment on microflora of dried figs." Journal of food engineering 75.3 (2006):396-399.
Mycobacterium avium	99.9%	0.1	N/A	CT values of 0.1 to 0.17	http://scholar.lib.vt.edu/theses/available/etd-120898-143217/unrestricted/MAVIUMRES1.PDF
Mycobacterium forfuitum	90%	0.23 to 0.26 µg/ml	1.67	In ozone demand free water	http://earthsafeozone.com/pdf_docs/Microbiological_Aspects_of_Ozone.pdf
Mycobacterium tuberculosis	99%	0.05	10	CT of 0.5 for 99% reduction	http://www.delozone.com/files/ozone-overview-drinkingh2o-1999.pdf
Norwalk virus	99.9%	0.37	0.167	N/A	http://www.ncbi.nlm.nih.gov/pmc/articles/PMC165156/
P. aeruginosa	99.9999%	0.64-0.188	N/A	In deionized water	Mena, Kristina D. "Risk Assessment of Pseudomonas aeruginosa in Water." Reviews of environmental contamination and toxicology 201(2009):71-115.
P. flourescenes	98% to 99.99%	0.2 to 1.2 µg/ml	< 0.5	In ozone demand free water	http://earthsafeozone.com/pdf_docs/Microbiological_Aspects_of_Ozone.pdf
Polio 1	99.99%	0.052	10	N/A	http://www.nap.edu/openbook.php?record_id=1904&page=45

Polio 2	99.99%	0.052	10	N/A	http://www.nap.edu/openbook.php?record_id=1904&page=45
Polio 3	99.99%	0.22	10	N/A	http://www.nap.edu/openbook.php?record_id=1904&page=45
Pseudomonas Aeruginosa	99.9999%	1.85 – 2.25	5	ppm is measure at nozzle	http://www.wqpmag.com/Ozone-An-Advancing-Technology-article8838 http://www.wqpmag.com/Ozone-An-Advancing-Technology-article8838
Pseudomonas flourescens	99.99999%	Approx. 0.5	0.25	In phosphate buffered saline	http://www.nap.edu/openbook.php?record_id=1904&page=45
Rotavirus human	99.9%	0.1 to 0.3 µg/ml	6	In phosphate buffer	http://earthsafeozone.com/pdf_docs/Microbiological_Aspects_of_Ozone.pdf
Rotavirus (HRV)	99.9%	0.1 to 0.3	0.1	Tested on mice	http://aem.asm.org/cgi/reprint/53/9/2218
Rotavirus SA 11	99.9%	0.1 to 0.25 µg/ml	6-8	In phosphate buffer	http://earthsafeozone.com/pdf_docs/Microbiological_Aspects_of_Ozone.pdf
Rotavirus WA (ATCC)	98%	2.1 to 4.2 µg/ml	1	N/A	http://earthsafeozone.com/pdf_docs/Microbiological_Aspects_of_Ozone.pdf
Rotavirus WA (Wooster)	98% to 99.99%	1.9 to 15.9 µg/ml	1	N/A	http://earthsafeozone.com/pdf_docs/Microbiological_Aspects_of_Ozone.pdf
S. aureus	99.99% to 99.9999%	0.3 to 1.97 µg/ml	10	In ozone demand free water	http://aem.asm.org/cgi/reprint/61/9/3471 http://earthsafeozone.com/pdf_docs/Microbiological_Aspects_of_Ozone.pdf http://iadr.confex.com/iadr/pef08/techprogram/abstract_110629.htm http://www.ncbi.nlm.nih.gov/pubmed/12046522
Salmonella	99.9999%	0.64-0.188	N/A	In deionized water	Mena, Kristina D. "Risk Assessment of Pseudomonas aeruginosa in Water." Reviews of environmental contamination and toxicology 201(2009):71-115.
Salmonella Choleraesuis	99.9999%	1.85 – 2.25	3	ppm is measure at nozzle	http://www.wqpmag.com/Ozone-An-Advancing-Technology-article8838
Salmonella enteritidis	98% to 99.99%	0.5 to 6.5 µg/ml	0.5	N/A	http://earthsafeozone.com/pdf_docs/Microbiological_Aspects_of_Ozone.pdf

Salmonella typhimurium	99.99999%	Approx. 0.5	0.25	In phosphate buffered saline	http://www.nap.edu/openbook.php?record_id=1904&page=45 http://earthsafeozone.com/pdf_docs/Microbiological_Aspects_of_Ozone.pdf
Shigella flexneri	99.99999%	Approx. 0.5	0.25	In phosphate buffered saline	http://www.nap.edu/openbook.php?record_id=1904&page=45
Spores of Bacillus species	99%	--	0.35	N/A	http://www.nap.edu/openbook.php?record_id=1904&page=45
Staphylococcus Aureus	99.9999%	1.85 – 2.25	10	ppm is measure at nozzle	http://www.wqpmag.com/Ozone-An-Advancing-Technology-article8838
Streptococcus faecalis	99.99%	9 µg/L	Approx 2	N/A	http://www.epa.gov/OGWDW/mdbp/alternative_disinfectants_guidance.pdf http://tersanoprofessional.com/login/doc/germicidal_studies_on_aqueous_ozone.pdf
Trichophyton Mentagrophytes	99.9999%	1.85 – 2.25	0.5	ppm is measure at nozzle	http://www.wqpmag.com/Ozone-An-Advancing-Technology-article8838
Vasicular Stomatitis Virus	Sub. Inactive	0.64	Very little	N/A	http://aem.asm.org/content/29/3/340.abstract
Vibrio cholerae	99.99999%	Approx. 0.5	0.25	In phosphate buffered saline	http://www.nap.edu/openbook.php?record_id=1904&page=45
Yeast	100%	$P < 0.05$	15	In dried figs	Oeztekin, Serdar and OZTEKIN. "Effects of ozone treatment on microflora of dried figs." Journal of food engineering 75.3 (2006):396-399. http://tersanoprofessional.com/login/doc/germicidal_studies_on_aqueous_ozone.pdf
Yersinia	99.9999%	0.64-0.188	N/A	In deionized water	Mena, Kristina D. "Risk Assessment of Pseudomonas aeruginosa in Water." Reviews of environmental contamination and toxicology 201(2009):71-115.
Z. bailii	99.99%	At nozzle (0.166-0.246). Whole system (0.043-0.084)	Instantaneously	N/A	http://aem.asm.org/cgi/reprint/61/9/3471

Other information:

http://www.earthsafeozone.com/pdf_docs/Microbiological_Aspects_of_Ozone.pdf
http://www.ncbi.nlm.nih.gov/pubmed/11789930
https://tspace.library.utoronto.ca/bitstream/1807/15576/1/MQ58690.pdf
http://krex.k-state.edu/dspace/bitstream/2097/103/1/EdwinVelezRivera2005.pdf
http://www.foodengineeringmag.com/Articles/Feature_Article/BNP_GUID_9-5-2006_A_10000000000000302660

For more information please visit the International Ozone Association website: http://www.io3a.org/

tersano™

1-800-808-1723
www.tersano.com