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Microbial MOS VS HYPO Comparison Table

A Compilation of Data Showing Mixed Oxidant Solution Superiority in Microbial Inactivation Compared to Hypochlorite (Bleach)

MIOX mixed oxidants have been proven in numerous laboratory studies to achieve more rapid and thorough inactivation of a wider range of microbial contaminants, including species highly resistant to chlorination, than conventional chlorine. The table below illustrates this point. Further, The MSR MIOX Purifier, the hand-held version of MIOX technology, passes the Environmental Protection Agency's (EPA's) Guide Standard and Protocol for Microbiological Purifiers, achieving more than the required inactivation level for viruses (4 log), bacteria (6 log), and protozoan oocysts (3 log) in both clean and dirty waters

Microorganism	MIOX Dose (mg/L)	Bleach Dose (mg/L)	Contact Time MIOX (min.)	Contact Time Bleach (min.)	Inactivation (log)	Differentiating Parameter	Reference
BACTERIA							
Vibrio cholerae	2	2	1.8	4.0	4 log	Time	Venczel et al, 2004
Escherichia coli	2	2	3.8	5.0	4 log	Time	Venczel et al, 2004
Pseudomonas aeruginosa	2	2	10	10	>4.8 MIOX 2.2 Bleach	Efficacy	Barton, 1996
Legionella pneumophilia	2	2	10	10	>5.0 MIOX 4.7 Bleach	Efficacy	Barton, 1996
Staphylococcus aureus	2	2	60	60	1.6 MIOX 0.8 Bleach	Efficacy	Russell, 2001*
	4	**4**	60	60	3.7 MIOX 2.3 Bleach		
Listeria monocytogenes	2	2	60	60	2.0 MIOX 0.8 Bleach		
	4	**4**	60	60	3.7 MIOX 1.2 Bleach		
BACTERIAL SPORES							
Bacillus sterothermophilus	2	2	30	30	>5 MIOX 2.5 Bleach	Efficacy	Barton, 1996
Clostridium perfringens spore	2	2	13	18	2 log	Time	Venczel et al, 2004
Bacillus globigii spores *Bacillus anthracis (Sterne)* spores	2.5	2.5	15	15	3.6 MIOX 2.4 Bleach	Efficacy	Bajszar, 2008 and CDC, 2009†

Microorganism	MIOX Dose (mg/L)	Bleach Dose (mg/L)	Contact Time MIOX (min.)	Contact Time Bleach (min.)	Inactivation (log)	Differentiating Parameter	Reference
VIRUS							
MS2 Coliphage	2	2	70	168	4 log	Time	Venczel et al, 2004
Vaccinia (Smallpox Surrogate)	5	~70	20	10	4 log MIOX 3 log Bleach	Concentration Time Efficacy	Wright et al, 2001 Groupé, V. et al, 1955
Poliovirus Vaccine Strain 1	>4	NA	30	NA	>5.5 log MIOX	NA	Biovir, 2002
Rotavirus SA-11	>4	NA	30	NA	>5.5 log MIOX	NA	Biovir, 2002
PROTOZOAN OOCYSTS							
Giardia lamblia	>4	NA	30	NA	>4 log MIOX	NA	Biovir, 2002
Cryptosporidium parvum oocyst	5	5	240	1440	3, MIOX None, Bleach	Time and Efficacy	Venczel et al, 1997
Cryptosporidium parvum oocyst	25	25	240	240	>1, MIOX 0.25 Bleach	Efficacy, qRT-PCR and tissue culture infectivity	Bajszár & Dekonenko 2010

*These data were collected using the Impedance Detection Method (IDT) at pHs ranging from 6.5-9.0.

† Researchers at the Centers for Disease Control obtained similar results using a different strain of spore.

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