Chemical Decontamination
Microbiological prevention

EVEREST
SCIENCE

Reactivity

Oxydant	REDOX (V)
OH	2.80
O	2.42
O_3	2.07
HOCl	1.49
Cl_2	1.36
H_2O_2	0.87
O_2	0.40

Ozone Applications Water Rules of Thumb

Application	Conc. O_3 (ppm)	Contact Time (min)
Reverse Osmosis Water	0.3 – 0.5	4 – 5
Drinking Water	1.0 – 2.0	5 – 10
Pool	0.3 – 0.7	1
Seafood Wash	0.1 – 0.15	1-2
Fruit & vegetable wash	0.2 – 0.4	1-5
Hydroponic	0.1 – 0.2	2-5
Cooling Tower	0.2 – 0.5	2
Pre-surgical wash	3 – 5	3-5

Biological Lethal Coefficients of Common Disinfectants

Disinfectant	Entero-bacteria	Virus	Bacterial Spores	Amoebic Cysts
O_3	500	5	2	0.5
HOCl	20	1	0.05	0.05
OCl^-	0.2	<0.02	<0.0005	0.0005
NH_2Cl	0.1	0.0005	0.001	0.02

BLC : high value = high disinfection power

Ref: Hamil and Clawson, Water Technology, April 1997

Ozone Applications (Air)

Contaminant	Applications	Conc. O_3
Bacteria - Rhisoctania Solani - Phytophtora Solani	Meat	0.1 ppm
Ethene	Fruits	0.05 ppm
Spores	Cheese	0.02 ppm
Salmonella	Eggs	0.1 ppm
Mold	Starch, flour, straw, grains	0.05 ppm*
Fats & Grease	Cotton, wool	0.05 ppm**

* Secondary Effect: Bleaching
** Secondary Effect: Improved dye-ability

CT for Common Disinfectants

(pH = 6 - 9)

	Free Chlorine	Cloramine NH_2Cl	Chlorine Dioxide ClO_2	
E.Coli	0.034 – 0.05	0.4-0.75	0.02	
Rotavirus	0.01 – 0.05	0.2 – 2.1	0.006 – 0.06	
G. lamblia cysts	47 – 150	____	0.5 – 0.6	
G. muris cysts	30 – 630	7.2 – 18.5	1.8 – 2.0	

* CT = Conc. O_3 (ppm) x Contact Time (min)
* Established by EPA, 99.9% neutralisation of micro-organisms

Ref: Hamil et Clawson, Water Technology, April 1997

Ozone Toxicity

Ref : Perry, Chemical Engineering, Mai 1993