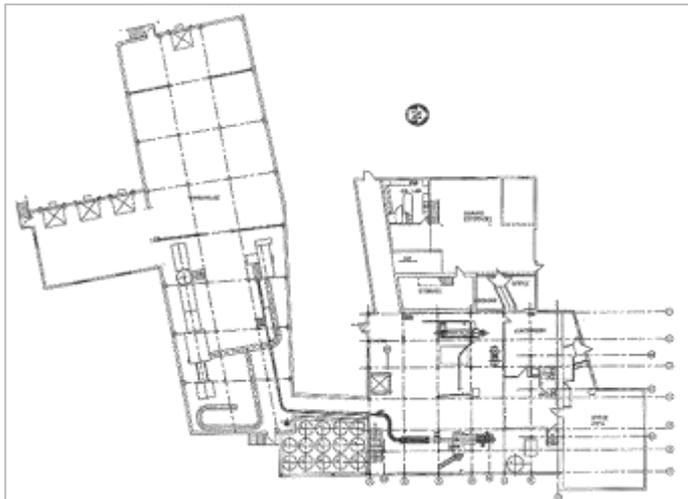


CD ClorDiSys



Bolstering Your Sanitation
Program with Chlorine Dioxide
Gas

Chlorine Dioxide Gas

Improves sanitation programs by resetting the sterility of the facility



Principles of Sanitation

In order for any sanitation method to be effective, the method must:

- ✓ **Be able to kill the organism in question**
- ✓ **Achieve good and complete distribution**
- ✓ **Achieve thorough and total penetration**
- ✓ **Achieve sufficient contact time
at the correct concentration**



Traditional Sanitation Methods

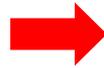
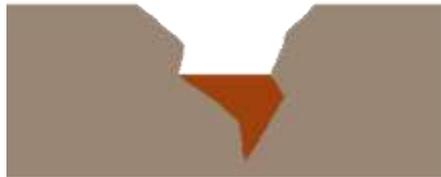
Traditional sanitation methods can have difficulty guaranteeing that all organisms have been contacted / contacted with the proper dosage

The sanitation method must:

- ✓ **Be able to kill the organism in question**
- ? **Achieve good and complete distribution**
- ? **Achieve thorough and total penetration**
- ? **Achieve sufficient contact time**
at the correct concentration

Traditional Sanitation

Pathogens become established in a crevice



Pathogens multiply and leave the crevice



Sanitation

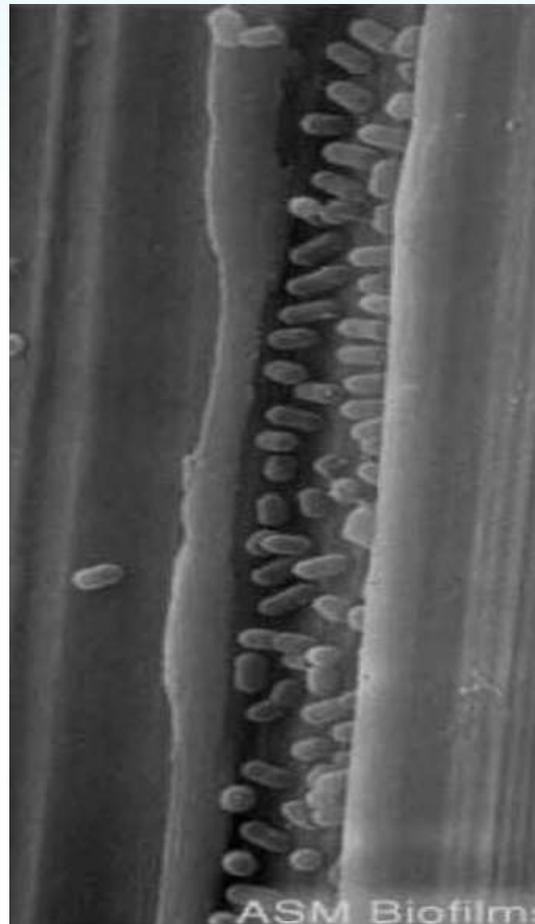


Some Pathogens Survive to Continue the Cycle



Liquid based sanitation methods (vapors, fogs, sprays) have difficulty reaching deep into crevices where pathogens may be located. This allows them to survive the sanitation/decontamination method and continue to pose a threat to the facility.

Stainless Steel is Ideal ...but Not Perfect

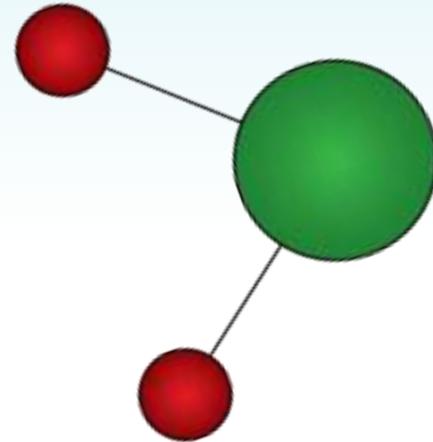


This shows a scratch in a stainless steel surface harboring bacteria.

Chlorine Dioxide Gas

Chemical Properties:

- Yellow-Green Gas ¹
- Water Soluble ²
- True Gas at Room Temp³



1. Ability to be monitored in real time with a photometric device.
Not subject to condensation or affected by temperature gradients.
2. Ability to penetrate water (not all sterilants can penetrate water, *vapors can not*)
3. Chlorine dioxide is a “true gas” at room temperatures; which means excellent distribution and penetration.

Chlorine Dioxide Gas Process

- **Pre-Conditioning**
Raise relative humidity to 65-75%
- **Conditioning**
Hold that humidity level for a short period of time
- **Charge**
Inject CD Gas to a concentration of 1 - 5 mg/L
- **Exposure**
Hold time at that CD Gas concentration
- **Aeration**
Remove CD Gas

Principles of Sanitation

In order for any sanitation method to be effective, the method must:

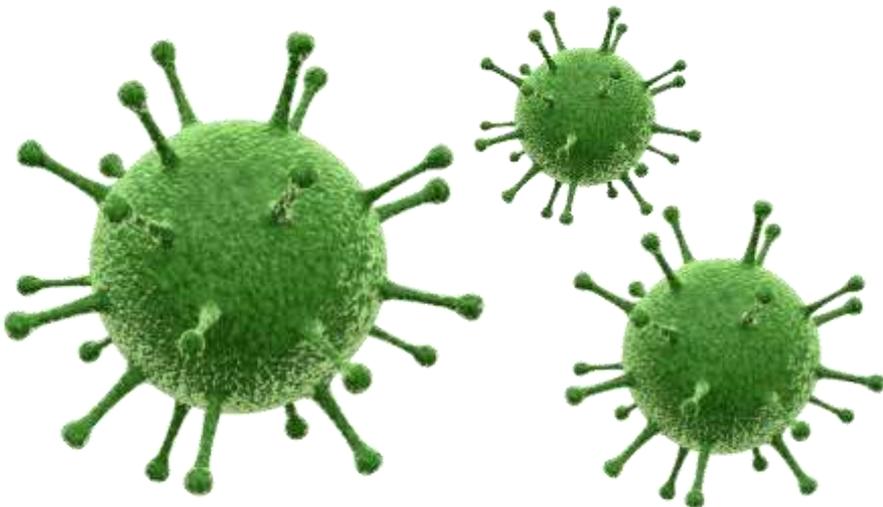
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at the correct concentration



Biocidal Effectiveness

Chlorine Dioxide Gas	
Registration	Sterilant

Chlorine dioxide gas is registered as a sterilant, which means it is capable of eliminating all viruses, bacteria, fungi and spores.



All decontaminations are performed to provide a sterilization level kill (6-log sporicidal reduction)

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Wet Areas

As Chlorine Dioxide Gas is water soluble, it is able to maintain its efficacy within water, so areas do not have to be completely dry for the process to work.

As wash downs and manual cleaning traditionally occur prior to decontamination, using chlorine dioxide gas means that surfaces do not need to be completely dry prior to decontaminating.



Distribution

A chemical can't kill what it can't reach.

Chlorine Dioxide Gas	
Boiling Point (at use concentration)	-40°F
Natural State at Room Temperature	Gas

Gasses fill the space they are contained within evenly and completely.

Chlorine Dioxide Gas is able to evenly fill the area it is decontaminating, no matter how large, tall or filled with equipment.

Distribution



Distribution



Principles of Sanitation

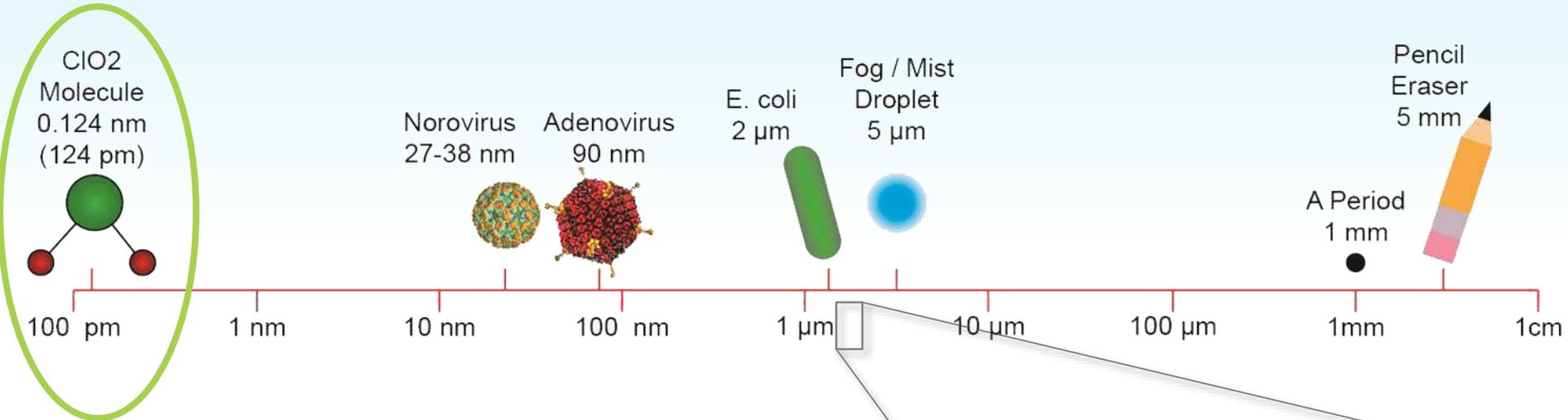
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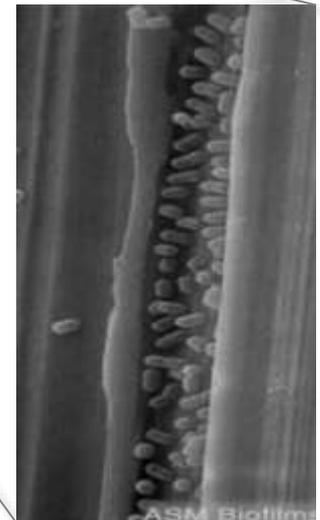


Penetration into Crevices

Organisms sizes vs ClO₂ molecule

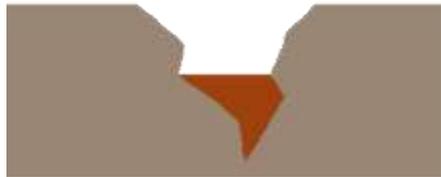


Magnified scratch in stainless steel harboring bacteria



Chlorine Dioxide Gas

Pathogens become established in a crevice



Pathogens multiply and leave the crevice



Chlorine Dioxide Gas



No Pathogens Survive

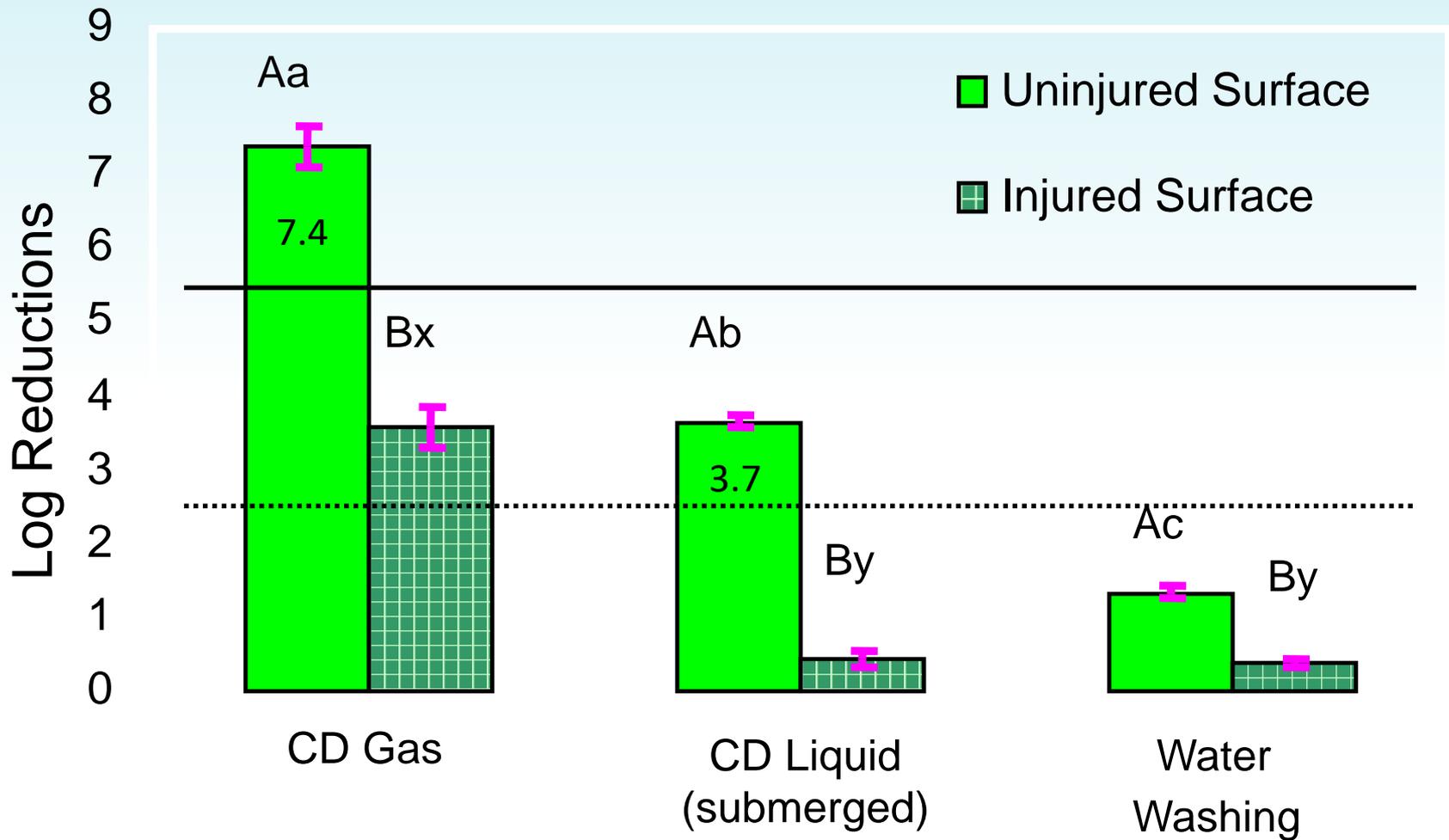


Harborage Sites and Resident Strains Are Eliminated

As a sterilant gas which naturally fills the space its introduced into, with a molecule size smaller than the smallest virus, chlorine dioxide gas offers the best opportunity to completely eliminate a contamination from an environment.



Gas vs. Liquid



Equal concentrations of CD Gas and Liquid used

All the treatments were for 10 min at 20°C

(Han, Y. et al, Reduction of *Listeria monocytogenes* on Green Peppers (*Capsicum annuum* L.) by Gaseous and Aqueous Chlorine Dioxide and Water Washing and Its Growth at 7°C, *Journal of Food Protection*, Vol 64, No 11, 2001 pages 1730-1738)

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Process Control

Process control is where the difference between ClorDiSys and other chlorine dioxide gas companies differ

Penetration Behind Objects



BIs Killed

Penetration Under Forklift Tire



BI Killed

Gaps and Crevices



Shipping Containers

Fill them with equipment, or decontaminate them by themselves



Trailers

Fill them with equipment, or decontaminate them by themselves



Ductwork

Chlorine Dioxide Gas can decontaminate ductwork as it easily travels through the bends, blowers, and filters that correspond to the ductwork.



Tented Equipment



Processing Tanks and Piping

Decontaminate piping and any tanks connected by the piping.

Great for clean breaks!



Clean Breaks

Similar to a firebreak in a forest



Why ClorDiSys?

Why ClorDiSys?

Trust

Why ClorDiSys?

ClorDiSys is trusted to keep critical environments safe and is used by:

- **Many of the world's leading biosafety laboratories**
- Pharmaceutical production facilities
- 31 of the Top 100 Food Manufacturers
- Food processors dealing with high profile recall

Learn more at booth 433

(or just grab me in a minute)

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