

Ultra-Pure Chlorine Dioxide in Food Protection: Superior Antimicrobial Performance

Moderator

Michael Bixler, CDG Environmental

Speakers

Patrick Schneider, CDG Environmental

Steve Flieder, IFC

Shamol Vyas, Gard'NClean



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Questions

All attendees are muted. Please submit questions at any time using the **Q&A** feature on your screen. Presenters will address questions at the end of the presentations.

Presenter Views

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... From The Current Headlines

[CDC Tracking 4 Active Foodborne Outbreaks | Contagion Live](#)

[Salmonella outbreak linked to Italian tomatoes again - Food Safety News](#)

[Nearly 333 pounds of tuna recalled over food poisoning risk - Yahoo](#)

[Raw milk cheese recalled following multi-state E.coli outbreak: FDA | Fox Business](#)

[Alfalfa Sprouts Recalled Due to Bacteria Causing Nausea and Bloody Diarrhea | Parade](#)

[FDA Opened a New Listeria Outbreak Investigation on September 30, 2026 - Food Poison Journal](#)

[New Listeria outbreak under investigation | Food Safety News](#)

Attributes of a “Perfect Biocide”

- Fast Acting
- Effective on Biofilm
- No Rinse Required
- Broad pH Range
- Cost Effective
- Microbial
- No Halogenic
- Safer to Use

What is Chlorine Dioxide (ClO₂)

- Chlorine Dioxide exists as a yellowish-green Gas – ClO₂
- Chlorine Dioxide has a chlorine-like odor, but does not contain any chlorine
- Chlorine Dioxide is highly soluble in water
- Chlorine Dioxide is a selective oxidant

What is NOT Chlorine Dioxide (ClO_2)?

- Sodium Chlorite (NaClO_2) This must be Activated
 - *KEEP OUT OF REACH OF CHILDREN CAUTION SEE SIDE PANEL FOR ADDITIONAL PRECAUTIONARY STATEMENTS*

Active Ingredient:

Chlorine Dioxide..... 2.0%

Other Ingredients..... 98.0%

Total..... 100.0%

- Acidified Sodium Chlorite (ASC)
 - Mixing of sodium chlorite with an acid
This will form HClO_2 which is Chlorous Acid

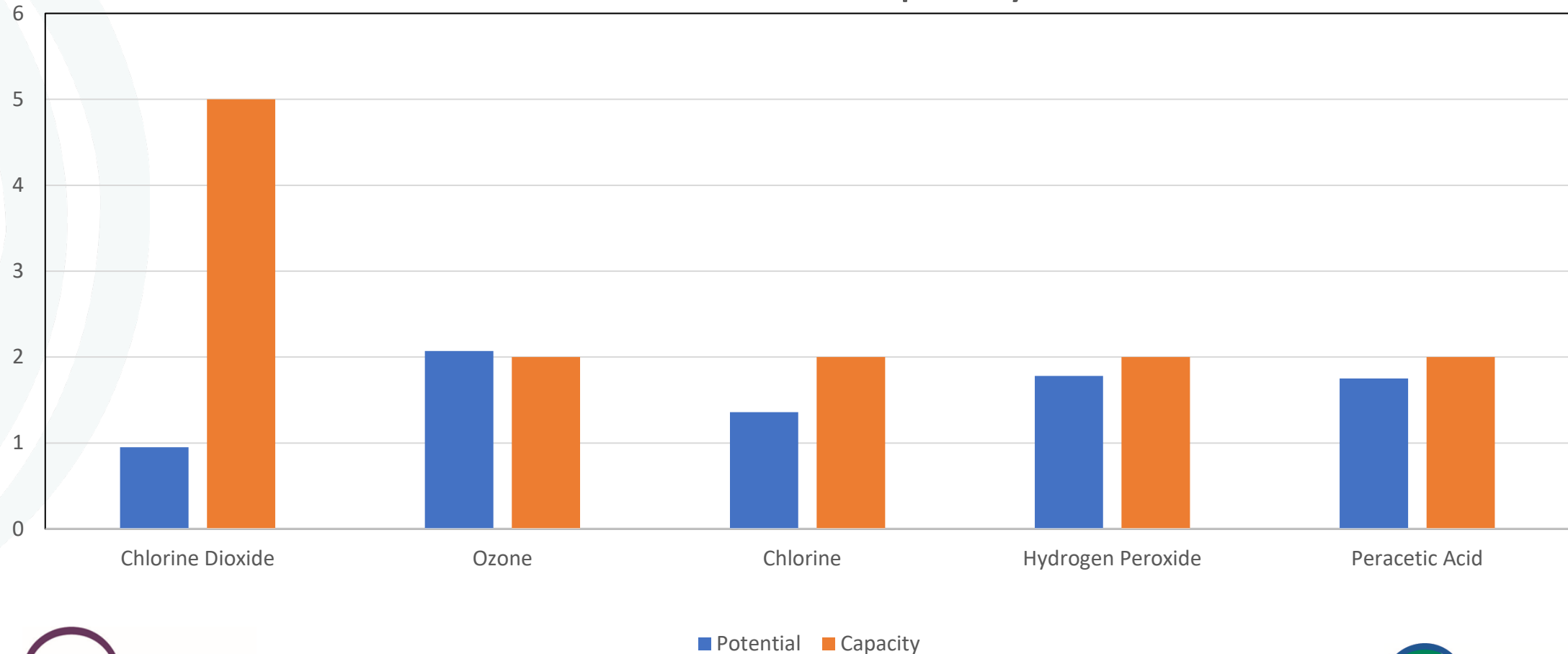
Why is Chlorine Dioxide a Unique Oxidant?

- Broad pH Range
 - 4 – 10
- Hydrolysis
 - Chlorine dioxide remains as a true gas when dissolved in water
- Oxidizing Potential –vs- Oxidizing Capacity?
 - Potential: How strong is it.
 - Capacity: How much can it oxidize

*****Chlorine dioxide has a low potential but a high capacity*****

Oxidizing Potential –vs- Oxidizing Capacity

Potential vs Capacity



Advantages of Ultra-Pure Chlorine Dioxide

- Biofilm disruption
- Effective at low ppm
- Nothing as build resistance
- No rinsing is required
- Features of the gas

Uses for an Aqueous Solution of ClO_2

- Food contact sanitation
 - Extend freshness
 - Flume wash
- Food contact equipment sanitation
 - Final sanitation step w/o rinse
 - Sanitation break in production
- Water disinfection
 - Water lines
 - Rinse water
- Non-Food Contact
 - Floors
 - Drains

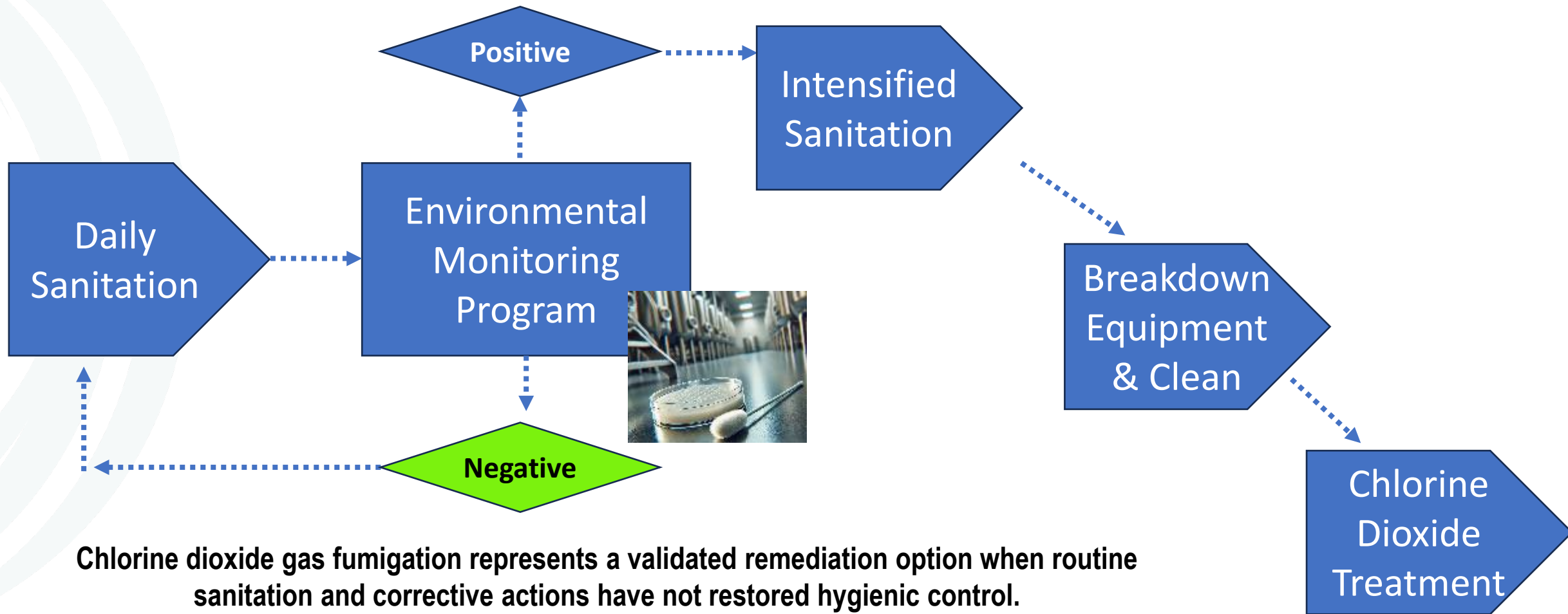
Uses for Gaseous Chlorine Dioxide

- Fumigation
- Fogging

When is Gas Fumigation Appropriate?

1. **Unresolved customer findings** of pathogen presence for a number of weeks or months and just can't remediate themselves (Listeria, Salmonella most common)
2. **New construction and/or new equipment** to assure that no pathogens have been brought in during the construction process
3. **FDA or USDA has inspected & swabbed and found issues** that the customer needs to document a 'fix'. They *may* return at some point and can shut down a plant (and/or prosecute)
 - a. FDA 483 letter or USDA Form 6500-4 "inspection report": found some things that 'should' be fixed
 - b. FDA Warning letter or – USDA "NOIE" notice of intended enforcement: found some things and if not fixed can shut down the plant

Typical Response to Unresolved Pathogen Contamination



Chlorine dioxide gas fumigation represents a validated remediation option when routine sanitation and corrective actions have not restored hygienic control.

Proactive Hygienic Restoration – New Construction / New Equipment Installation

- Impossible to clean everything and swab every possible area that may harbor a hidden microbial issue
- Some data from several customers have shown:
 - 300 – 500 weekly “clean” swabs during that do not adequately assess the microbial risk
 - A chlorine dioxide treatment prior to startup has eliminated any pathogen hits for as much as 9+ months post construction
 - Starting up operations with a documented ‘clean break’ allows for routine sanitation vs. intensified sanitation
 - Uses routine labor and chemical reduces downtime and costs post-construction

It is impossible to clean and swab everything, and has been proven that a post construction (pre startup) clean break is beneficial for prevention

Are there any EH&S concerns?

GHS Classification: Corrosive to Metals Category 1

Skin Irritation: Category 2

Eye Irritation: Category 2B

Acute Toxicity – Inhalation: Category 4

The OSHA permissible exposure limit (PEL) for ClO₂ gas in air is 0.1 ppm (0.3 mg/m³) as an 8-hour time weighted average. NIOSH recommended exposure limits (REL) and ACGIH threshold limit values (TLV) are also 0.1 ppm.

Exposure Guidelines (vapor)

OSHA PEL 0.100 ppm – TWA

ACGIH TLV 0.100 ppm – TWA

ACGIH TLV 0.300 ppm - STEL

Are there any shipping concerns?

Aqueous Ultra-Pure Chlorine Dioxide Must Ship as a Hazardous Material

GHS Classification: Corrosive to Metals Category 1

Skin Irritation: Category 2

Eye Irritation: Category 2B

Acute Toxicity – Inhalation: Category 4



DOT Information: Regulated as a hazardous material when shipped by motor vehicle or rail car under UN 1760.

Proper shipping name: Corrosive Liquid, N.O.S.

Class: Class 8 – Corrosive.1

Packing group: III (must not ship or store in metal containers)

Hazard label: CORROSIVE

Technical name: 0.3% Chlorine Dioxide Aqueous Solution

Top 10 Reasons to use Aqueous Ultra-Pure Chlorine Dioxide

1. Aqueous Ultra-Pure Chlorine Dioxide does not need to be generated onsite
2. Aqueous Ultra-Pure Chlorine Dioxide contains pure gas which is dissolved in pure water
3. Aqueous Ultra-Pure Chlorine Dioxide has 2.6 times the oxidizing power of waterborne chlorine products
4. Aqueous Ultra-Pure Chlorine Dioxide is effective over a much wider pH range 4-10
5. Aqueous Ultra-Pure Chlorine Dioxide is registered with the EPA under the FIFRA guidelines
6. Aqueous Ultra-Pure Chlorine Dioxide is extremely effective at dispersing biofilm
7. Aqueous Ultra-Pure Chlorine Dioxide is approved as a non-rinse food contact/nonfood contact sanitizer
8. Aqueous Ultra-Pure Chlorine Dioxide is approved as a hard surface disinfectant
9. Aqueous Ultra-Pure Chlorine Dioxide does not form any THMs and HAAs (environmentally detrimental)
10. Aqueous Ultra-Pure Chlorine Dioxide (GasNow) has EPA approval for fumigation & fogging operations

Questions?

Shamol Vyas – Chief Visionary Officer - Gard'n Clean

sv@gardnclean.com



Steve Flieder – Business Manager – IFC

steve.flieder@indfumco.com



Patrick Schneider – Vice President Engineering / Operations - CDG

pschneider@cdgenvironmental.com



Michael Bixler – President – CDG

mbixler@cdgenvironmental.com



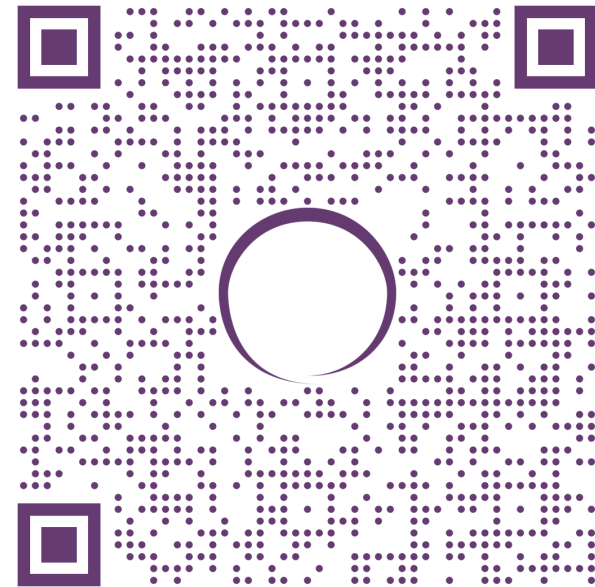
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October 8, 2026, 3:00 – 4:00 p.m. EST

From “Because I Said So” to “Tell Me Why”: The Generational Shift in Food Safety Culture

Rather than viewing the generational shift as a challenge to authority, we’ll discuss how understanding the “why” can strengthen employee ownership, improve communication, and create a workforce that is more confident speaking up.

October 14, 2026, 12:00 – 1:00 p.m. EST

Building Bridges: Networking Strategies for Students and Professionals in Food Safety

This interactive Webinar equips attendees with practical strategies to connect effectively and build meaningful professional relationships at conferences, online, and in interviews while avoiding common pitfalls in communication and etiquette.

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