

# DOXYKLOR

Simple. Safe. Aseptic Pathogen Control



Though recognized as a “Gold Standard” disinfectant, chlorine dioxide historically had to be generated on-site: a difficult, costly and dangerous process.

Not anymore.  
DoxyKlor™ offers a practical and safe solution.  
**SIMPLE, SAFE ASEPTIC PATHOGEN CONTROL.**



# About Us

The team behind DoxyKlor™ is a passionate group of critical thinkers who develop and bring together technologies that are ingenious solutions to challenging real life problems in a simple, smart and greener way.

## Simple, Safe Aseptic Pathogen Control

- Our products are developed with the end-user in mind.
- We take responsibility in how our products impact the safety of our customers, users and planet.
- Our end goal is easy-to-use, highly effective pathogen control.
- We are specialist in pre-mix chlorine dioxide with a strict commitment to quality and purity.
- Active chlorine dioxide, not “stabilized”



# Product

DoxyKlor™ is a cutting edge sanitizer/disinfectant based on reagent-grade components that bring the power of **active** chlorine dioxide gas in a ready-to-use liquid form. Our proprietary colloidal suspension process makes it possible to offer a true chlorine dioxide product that is safe, easy and effective enough for commercial use.

# Chemistry

The base chemistry exclusive to all DoxyKlor™ products focuses strictly on quality and safety resulting in the purist and most effective chlorine dioxide product available.

- Does not allow for the formulation of free chlorine
- No added polluting accelerators or catalysing chemicals to increase yield
- The only safe and stable colloidal suspension delivery method of chlorine dioxide gas ready for commercial use. (patented)
- High quality materials ensure consistent performance and vastly superior shelf life
- No onsite generation, ready-to-use single part liquid or gel
- Not a sodium chlorite solution (more effective)

**3-in-1**  
Sanitizer  
Disinfectant  
Deodorizer

# DoxyKlor™ Difference

DoxyKlor™ is different from all other chlorine dioxide products on the market.

## More Convenient and Cost Effective

- ✓ No rinse, No residuals
- ✓ Single Part, No onsite generators
- ✓ Long shelf-life
- ✓ Effective at low concentrations

## Superior Pathogen Control

- ✓ 5x- 8x more efficient than bleach
- ✓ No pathogen mutation
- ✓ Excellent against biofilms and slimes
- ✓ Rapid kill rate of over 200 pathogens, virus, waterborne

## Safer and Eco-Friendly

- ✓ No alcohol, methanol, phenols
- ✓ Non-flammable
- ✓ Non-corrosive
- ✓ Non-irritating, minimal PPE

Bactericide | Fungicide | Slimicide | Sporicide | Virucide

# DoxyKlor™ Difference

DoxyKlor™ is Active Chlorine Dioxide

Stabilized Chlorine Dioxide *is not* Active Chlorine Dioxide. “Stabilized chlorine dioxide” is in fact Sodium Chlorite (a salt. The “stabilized” term attempts to market Sodium Chlorite formulations as having the same or similar chemical properties to Active Chlorine Dioxide. However, they are quite different.

“Stabilized” Chlorine Dioxide is prepared by buffering sodium chlorite with carbonate or phosphate, and hydrogen peroxide. This approach stabilizes the chlorite not the chlorine dioxide. The stabilized compound is not the same as chlorine dioxide, nor does it have the same oxidizing properties. The oxidizing potential is much lower and the compound is far less useful as a product in general.

DoxyKlor captures *Active Chlorine Dioxide* (a gas) in an aqueous solution to allow its properties to be utilized on an as-needed basis in a controlled concentration. Chlorine dioxide gas does not react with water and stays as chlorine dioxide within the water. This enables it to kill organisms within the water, as well as any on the surface beneath the water. This trait is *unique to chlorine dioxide* among decontaminating fumigants, as hydrogen peroxide dilutes in water and cannot kill organisms in or beneath the water.



# Common Myths & Misconceptions

## **MYTH: Quaternary compounds are the strongest antimicrobial.**

Compared to active chlorine dioxide, alcohols and quaternary ammonium compounds are less (or not) effective against viruses and mycobacteria and have no credible efficacy against bacterial spores in unacceptable contact times. In fact, active chlorine dioxide is the “go-to” agent for Anthrax decontamination of Federal buildings. Chlorine dioxide has a proven public record of being a high-level sporicidal disinfectant in contact times as short as 30 seconds. Moreover, as chlorine dioxide’s primary mode of microbial kill is via electron exchange within the molecular structure. This means it is not possible for the organism to develop resistance.

## **MISTAKEN IDENTITY : Active chlorine dioxide is more corrosive than hydrogen peroxide.**

Chlorine dioxide is compatible with the majority of materials commonly found in industrial, medical and pharmaceutical equipment and environments. The misassumption can be attributed to stabilized chlorine dioxide solutions, which have acidic byproducts that are very destructive. Active chlorine dioxide products utilize a pure chlorine dioxide, which is both scientifically and statistically less corrosive than hydrogen peroxide, which condenses on surfaces, increasing corrosivity and contributing to its noted incompatibility with some epoxy finishes on walls and floorings as well as other materials.


## **MISUNDERSTANDING : Active chlorine dioxide leaves a residue.**

The confusion originates via the generalization between all chlorine dioxide products. Some stabilized chlorine dioxide products do leave a residue, necessitating a post-treatment rinse. This residue is attributed to the nature of the product and its composition. Active (pure) chlorine dioxide does not leave a residue. In fact, one of the first commercial uses of pure chlorine dioxide gas was for the sterilization of implantable contact lenses. (In order for the process to be approved by the FDA, it had to be shown that pure chlorine dioxide gas did not leave a residue.)

## **MISCONCEPTION: Hydrogen peroxide is safer than active chlorine dioxide.**

DoxyKlor™ is active chlorine dioxide (a gas) in a colloidal suspension in water. It remains a gas within the water (its “delivery system”). In case of emergency the gas can be aerated down from full concentration to safe levels quickly. Hydrogen peroxide is a liquid at room temperature and therefore condenses on surfaces. This condensate takes much longer to dry and aerate from a space, needing hours if not overnight before it is safe to be in that space. This means that in the event of leakage, chlorine dioxide gas can be removed making the area safe in 30 minutes or less, while hydrogen peroxide can take until the next day.

# DoxyKlor vs. Other Chemicals

		Sodium/Calcium Hypochlorite (BLEACH)	Gluteraldehyde	Peracetic Acid	Quaternary Ammonium Compounds	Iodophors
<b>Performance</b>	Very High	Moderate	Moderate to High	Moderate	Moderate to High	Moderate
<b>Contact Time</b>	Seconds	Minutes to Hours	30 Minutes to several hours	Minutes	Minutes to Hours	Minutes to Hours
<b>Concentration</b>	.1 ppm – 500 ppm	1,000 ppm – 10,000 ppm	500 ppm to 10,000 ppm	30 ppm – 200 ppm	100 ppm – 10,000 ppm	500 ppm – 10,000 ppm
<b>pH</b>	Effective over Neutral to Acidic	Alkaline	Neutral	Acidic	Acidic to Neutral	Neutral to Acidic
<b>Corrosiveness</b>	Negligible	Iron and Aluminium	Negligible	Iron	Iron, Copper, and brass	Iron and Stainless Steel
<b>Toxicity</b>	Negligible	Harmful to tissue	Skin irritation	Skin and mucous membrane irritation	Skin irritation	Variable. Iodine is extremely toxic
<b>Biodegradable</b>	High	Moderate to Low	Moderate to High	High	Low	Low
<b>Cost</b>	Low to Moderate	Low	Moderate to High	Moderate to High	Moderate to High	Moderate to High



# How DoxyKlor™ Can Be Applied

DoxyKlor™ is extremely versatile. It can be used at full concentration or diluted. Applied by spraying, fogging, or submersion.

General Use Hard surfaces

Floors/Mopping

Enclosed Spaces

RO Systems

Cleaning In Place (CIP)

Tubing

Vents

Water Storage

Food Processing Equipment

Food Prep Areas

Drains

Facilities



# Who Can Benefit

DoxyKlor™ is a trusted solution for a vast number of vulnerable situations.

## Brewery and Restaurant

> General cleaning and sanitation, disinfecting, bathrooms, floors, walls, ventilation systems, odor control, tasting room, bar

> Food prep areas, non-food contact areas, counters, tables, floors, drains, odor control

> Brewery equipment, new bottle and container sanitations, fill equipment, spray and rinse equipment, CIP processes, fruit and vegetable rinse, non-food contact surfaces, RO systems, tubing, odor control

## Facilities Maintenance

> Facilities Maintenance, general cleaning and sanitation, disinfecting, bathrooms, floors, walls, ventilation systems, odor control

## Hospitality and Lodging

> Casinos, hotel common areas, hotel rooms, bathrooms, gyms, spas, pools, clubhouse, garbage receptacles, odor control, housekeeping

## Remediation and Restoration

> Mold and mildew eradication, smoke, floods and other natural disasters, odor control



# Testimonials and Use Cases



# Brewery & Beverage

## Membrane System Sanitation: CIP

### Problem:

Previous membrane system sanitation required complete removal, as systems were “fouling out”. Previous disinfectant treatments required multiple rinse and destroyed costly hollow fiber membranes.

### Solution:

DoxyKlor was brought in as a complete CIP system (100 to 200ppm) for weekly disinfection. No rinse/no flush requirements for DoxyKlor resulted in significantly less downtime. Membrane service life was considerably improved while increasing disinfection efficacy.



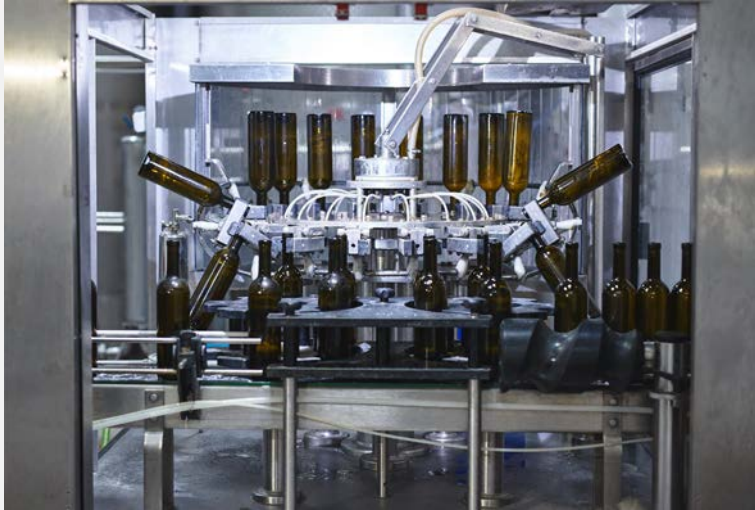
*“Doxyklor has been a great addition to our product line. We are utilizing it to sanitize membrane systems for our clients. Sensitive products require more frequent and thorough cleanings. We have had plenty of success with the Doxyklor line. Clients like Coca-Cola, Heinz/Kraft and numerous pressed juice companies rely on this product for peace of mind.”*

*John Kehrberg, Owner  
Process Perfection Consulting*



# Bottle Rinse

## Beverage Filling Facility



- Improve compliance
- Improve odor control
- Improve sanitation = fewer spoilage variables.
- NO toxic byproducts or odors
- Won't harm water-safe surfaces

### Problem:

Corrosive hypochlorite and chlorine sanitizing treatments form hazardous compounds that can taint food, and chlorine leads to TCA generation. Peracetic CIP systems are often sanitized with a strong caustic dose of 50mg/L. Peracetic acid can cause chemical burns to skin and leaves a distinctive vinegar odor that can be difficult to remove, even with repeated rinse cycles. Significant odor and hazardous conditions during regular automated spray cleaning prevent workers from entering bottle cleaning area.

### Solution:

1 to 5 mg/L chlorine dioxide CIP systems perform the same sanitizing function as all of these treatments, without the need for extensive rinse cycles. DoxyKor eliminates a wider range of pathogens, more safely and with no residual odors or flavors – just sanitized, food safe bottles and surfaces. Odor, corrosion of costly equipment, and hazards to workers are reduced, allowing safer and faster re-entry into the bottle cleaning area.



# Manufacturer Stops Outbreak

## Case Study: CIP at Selective Supplements

**Problem:** Destroying product lots because of microbial contamination vulnerability of starch and glucose based production in mold rooms, mixing tanks, automated assembly lines and drying rooms. Stringent observance of aseptic procedures using conventional disinfection products failed to meet high QC standards of the company.

**Solution:** Periodic, regularly scheduled inline cleaning using DoxyKlor™ to disinfect tanks and assembly lines, cleaning of molds, and fogging of drying rooms enabled company to exceed highest bar of expected aseptic standards prevent loss of product due to microbial contamination, ensure public safety and avoid potential for recall prompted by microbial contamination (as recently suffered by competitor).



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*“I rely on DoxyKlor. It makes me rest easy that there will be no problem in my facility.”*

*Jesus Garcia  
Plant Manager - Select  
Supplements*





# Nutraceutical: Select Supplements Continued

CIP



Fogging



# Repelling Odor from Mexican Quick Serve Food Chain Drains – A Case Study

Busy multi-location quick serve Mexican restaurant was having issues with odor control. The drains were emitting a terrible odor.



## USES

Killing of odor causing bacteria in drains.  
Poured 1 liter @ 500 ppm down each drain.

Sanitation of work surfaces and floors  
Spraying and mopping @ 200 ppm



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*“I was very surprised how well DoxyKlor got rid of the bad smell. I am a believer”.*

*Pepe  
Owner – Porkyland*

# Case Study – Mexican Quick Serve Food Chain, California

A test was conducted to demonstrate the speed and effectiveness of DoxyKlor™ on hard surfaces.

- Test location: Eat-up bar of restaurant
- Eat-up bar was swabbed and tested for contaminant load read very high at 1106 rlu.
- DoxyKlor at 200 ppm was spray directly onto the bar.
- After a 60 second dwell period. The area was swabbed and tested again. The contaminant load decreased drastically to 2 rlu.

Organic Contaminant Load Before DoxyKlor™

1106



Organic Contaminant Load After DoxyKlor™

2





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