

# TwinOxide in the Poultry Industry



# What is Chlorine Dioxide

- The “Chlorine Dioxide” molecule ( $\text{ClO}_2$ ) was discovered in the 19th century as an extremely powerful disinfectant.
- Production of Chlorine Dioxide is usually done by a Generator, combining two chemicals into a violent reaction. (producing 70% purity of  $\text{ClO}_2$ )
- Generated Chlorine Dioxide is **not producing a pure  $\text{ClO}_2$**  and will contain Chlorine gas, and Hypochlorous acid in the solution. Therefore generated  $\text{ClO}_2$  is not an option in the food industry.

# What is TwinOxide?

TwinOxide is a powerful two part powder product once mixed with water it will form a concentrate solution of 3000 PPM, 99.9% pure Chlorine Dioxide, stable to use for 30 days.



# Why is TwinOxide Different

- TwinOxide invented and Patented the way to make PURE ClO<sub>2</sub> without any by-products: (no Chlorine gas no Hypochlorous Acid)
  - At least 2,6 x more effective than chlorine gas
  - 7 x more effective than sodium hypochlorite
  - 7 x more effective than hydrogen peroxide
- In its diluted solution it is safe, stable, and non corrosive.
- It is taste free and odorless at user levels.
- It is easy to use, and has a wide application.
- It is environmentally safe, and simple to make on site.

# TwinOxide Chlorine Dioxide

- ✱ Powerful and rapid acting disinfectant
- ✱ Effective on all microorganisms
- ✱ No known resistance by microorganisms
- ✱ No harmful disinfection by-products
- ✱ Superior replacement for all other disinfectants

Chlorine ( $\text{Cl}_2$ )

Bromine ( $\text{Br}_2$ )

Halogen Donors (Misc)

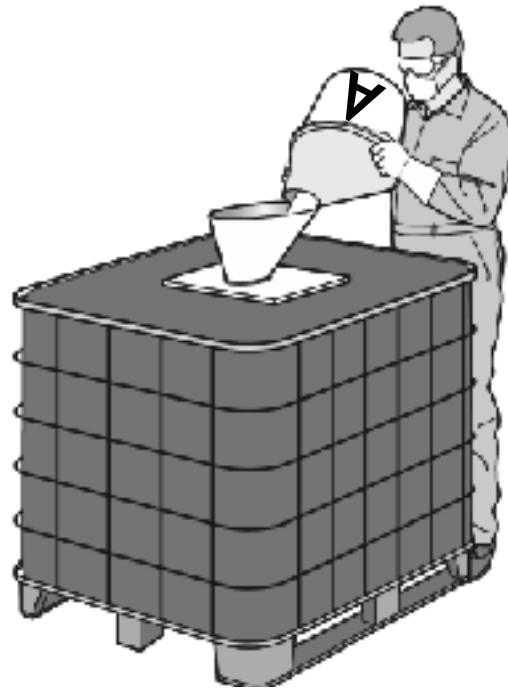
Chloramines ( $\text{CH}_2\text{Cl}$ )

Hydrogen peroxide ( $\text{H}_2\text{O}_2$ )

Per Acetic acid ( $\text{CH}_3\text{COOOH}$ )

Formaldehyde ( $\text{CHCOH}$ )

# How to make TwinOxide?



Add powder B into the dosing tank  
Add powder A into the dosing tank  
Wait 3 hours  
3000 PPM ClO<sub>2</sub> Ready to use anywhere

# Benefits of TwinOxide

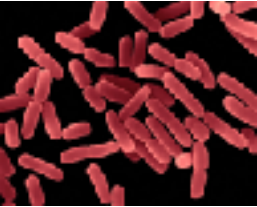
## Compared to Chlorine and Other Halogens

- No harmful Halogenated Organic By-Products  
**THM**      **HAA**      **Mutagen X**
- Lower residual disinfection concentration
  - Does not react with Ammonia
  - Much lower reaction with Hydrocarbons
  - Not corrosive to metals, plastics, elastomers
- Effective against **all** types of microorganisms  
**Bacteria, Fungi, Yeast, Algae, Viruses, Pathogens, Protozoa, Parasites, Biofilm, and spores.**
- Effective over a wide pH range 4 to 11
- 2.6 times more Oxidation Capacity

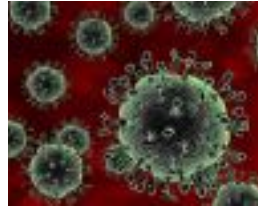
# Efficiency of Chlorine Dioxide

$Ct_{99\%}$  value = Concentration (ppm) and time (minutes)  
required to obtain a 99.9% kill

The lower the  $Ct_{99\%}$  the more efficient the biocide



**Bacteria**  
 $ClO_2$  0.19 ppm min  
 $Cl_2$  3.3 ppm min



**Viruses**  
 $ClO_2$  2.8 ppm min  
 $Cl_2$  8.0 ppm min

## Protozoan Parasites



**Giardia**  
 $ClO_2$  7.3 ppm min  
 $Cl_2$  41 ppm min



**Cryptosporidium**  
 $ClO_2$  40 ppm min  
 $Cl_2$  NOT KILLED

***Guidelines for  
Drinking Water  
Quality***

***World Health  
Organization  
2008***

Chlorine Dioxide is a rapid, concentration disinfectant  
with low disinfectant residual



# Performance

## Testing by Independent Laboratory

10 ppm for 10 minute contact time

>5 log reduction in *E. coli* (>99.999% kill)

>5 log reduction in *Salmonella* (>99.999% kill)

3 log reduction in *Listeria* (99.9% kill)

5 to 10 ppm  $\text{ClO}_2$  may be used for carcass sterilization and disinfection operations

# Approvals for TwinOxide

Approved for use in the Food Industry and Drinking Water Treatment

- Food Standards Australia New Zealand (FSANZ) approval for washing, peeling and disinfection.
- NSF International (NSF) and American National Standards Institute (ANSI) approval for treatment of drinking water.
- Hygiene-Institut des Ruhrgebiets, Gelsenkirchen, Germany, for contact with food and drinking water.
- United States Environmental Protection Agency (EPA)
- ClO<sub>2</sub> approval by FDA, USDA.
- Kosher and Halal Certified.

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# TwinOxide Applications

Healthy Total  
Disinfection  
“From Egg to Table”



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# Poultry House

## Drink Line Disinfection

Dosage typically  $<0.5$  ppm  $\text{ClO}_2$



Clean  
Water

Healthy  
Birds

## Increased Productivity



+56,600 kg  
US\$ 76,500

+



US\$ 67,500

=



US\$ +144,000/y

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**Data from TwinOxide Application (Baida AUS.)**  
Annualized and based on a sample of 3.1 million birds

# Poultry House

Disinfection of water used for Fogging to decrease air temperature.



TwinOxide will help control  
Viruses & Parasites in the air.

# Egg Handling

## Egg Handling and Hatching Egg Fumigation

- \* Fogging
- \* Hatchery Area
- \* Egg Storage Room

Food Egg Sterilization

Dosage typically  $<0.3$  ppm  $\text{ClO}_2$

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# Food Processing Plant

- Disinfection of Evisceration area spray systems and machinery
- Carcass washing prior to Boning Room entry
- Disinfection in Dip and spin chillers (NO THM Forming)
- Disinfection of Boning Room Spray equipment and machinery. (NO Cross Contamination)
- Air Conditioning, Chiller, Refrigeration System Cooling Water

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# Environmental Treatment

- Walls
- Floor
- Ceiling
- Equipment
- Truck Cleaning for Live Stock between Farms

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