

TwinOxide in the Poultry 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.



How is Chlorine Dioxide made?

- The “Chlorine Dioxide” molecule (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 ClO_2)
- Generated Chlorine Dioxide is not producing a pure ClO_2 and will still contain Cl_2 in the solution. Therefore generated ClO_2 is not a safe option in the meat industry.

What is 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 (Cl_2)

Bromine (Br_2)

Halogen Donors (Misc)

Chloramines (CH_2Cl)

Hydrogen peroxide (H_2O_2)

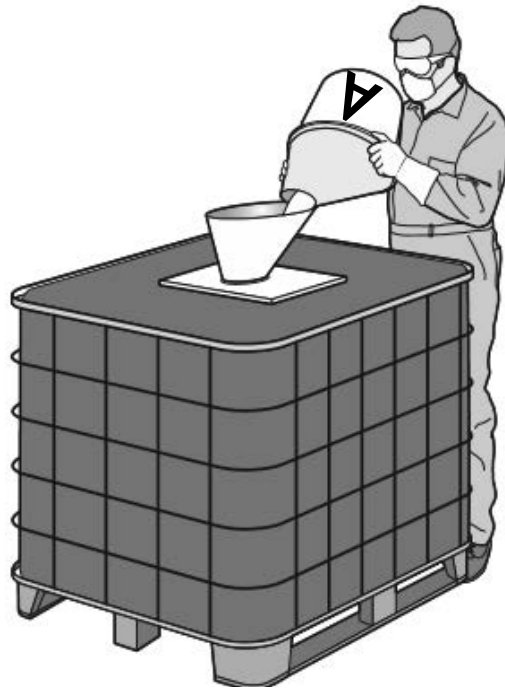
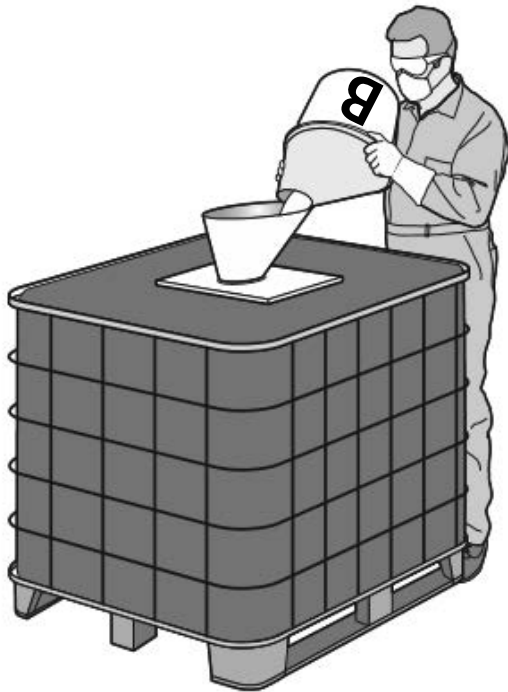
Peracetic acid (CH_3COOOH)

Formaldehyde (CHCOH)

How is TwinOxide Different?

- TwinOxide as a disinfectant and oxidizer is more powerful than chlorine gas, PAA or hydrogen peroxide :
 - 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.

How to make TwinOxide?



Add powder B into the dosing tank
Add powder A into the dosing tank
Wait 3 hours
3000 PPM ClO₂ 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 10
- 2.6 times more Oxidation Capacity

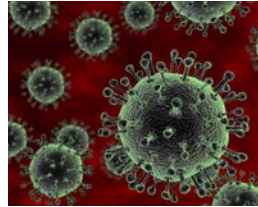
Efficiency of Chlorine Dioxide

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

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

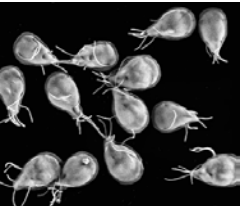


Bacteria
 ClO_2 0.19 ppm min
 Cl_2 3.3 ppm min

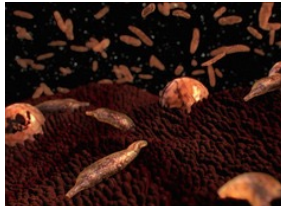


Viruses
 ClO_2 2.8 ppm min
 Cl_2 8.0 ppm min

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 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)
- ClO₂ approval by FDA, USDA.
- Kosher and Halal Certified.

Biosecurity

TwinOxide Applications

Healthy Total
Disinfection
“From Egg to Table”



Poultry House

Drink Line Disinfection

Dosage typically <0.5 ppm ClO_2



Clean
Water

Healthy
Birds

Increased Productivity



+56,600 kg
US\$ 76,500

+



US\$ 67,500

=



PROF



T

US\$ +144,000/y

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 ClO_2

Biosecurity

Food Processing Plant

- Disinfection of Evisceration area spray systems and machinery
- Carcass washing prior to Boning Room entry
- Disinfection of Boning Room Spray equipment and machinery
- Air Conditioning, Chiller, Refrigeration System Cooling Water

Biosecurity

Environmental Treatment

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

Biosecurity



Hatching
questions?

 **TwinOxide**®



 **TwinOxide**®
Total Water Disinfection