

***TwinOxide***<sup>®</sup>

*Total Water Disinfection Concept*



**REDEFINING THE WORLD  
OF WATER DISINFECTION**

**TwinOxide®** is a unique, advanced delivery system of two powder components that generates a 0.3% (3,000 ppm) pure chlorine dioxide solution that is applied as a (drinking) water disinfectant. TwinOxide® 0.3% solution is not explosive and not corrosive, thus ensuring the most optimized delivery system for chlorine dioxide molecules to provide their oxidation and disinfection capacities in water with simple, standard dosing equipment. The long kinetic halftime of 30 days of TwinOxide® 0.3% solution ensures bacteriological control. The powder kit has a guaranteed shelf life of five years.

**TwinOxide®** is delivered as a transportable, non-explosive powder kit of two components that, once added to a specific volume of water, reacts into an almost pure chlorine dioxide solution with a concentration of 0.3%.

The **TwinOxide® 0.3% solution** does not contain free chlorine. The active biocidal substance is the chlorine dioxide ( $\text{ClO}_2$ ) molecule, at least 10 times more powerful than chlorine and chlorine-type disinfectants.

**TwinOxide® 0.3% solution** kills all waterborne micro-organisms (including bacteria, viruses, yeast, mold, biofilm, etc). It is easy to use, simple to apply and contributes positively to human health as TwinOxide® disinfects water without producing hazardous by-products created as known from traditional disinfectants. The use of TwinOxide® does not cause a load on the environment as the rest products are harmless and negligible.

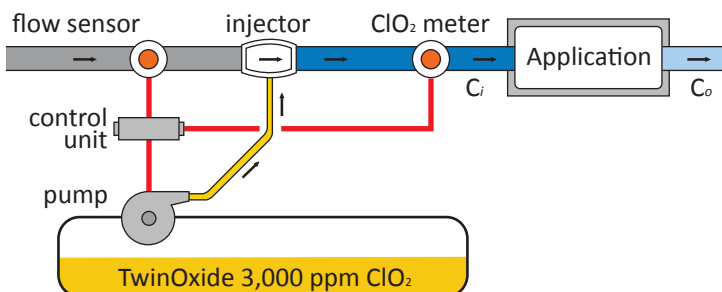
**TwinOxide®** provides safe water disinfection, with a superior yield and performance without the disadvantages of the traditional applications of chlorine or stabilized chlorine dioxide. Due to the purity of the TwinOxide® solution adverse substances to the  $\text{ClO}_2$  molecule are absent ensuring full spectrum disinfection power and oxidation power for microbiological control and biofilm stripping. TwinOxide® 0.3% solution is not corrosive and does not cause load on the environment.



**1 liter TwinOxide® disinfects 60,000 liters of drinking water at 0.05 ppm up to 1,000,000 liter at 3 ppb!**

**Equipment and Installation**

*Simple component requirements...*



**ONE SINGLE CONCEPT  
ADDRESSES MULTIPLE  
CHALLENGES IN  
WATER DISINFECTION!**

**Extensive Research**

Before TwinOxide® was offered to the global market place, extensive scientific research and certification were conducted, combined with extensive application tests.

Our company is backed by numerous scientists, engineers, physicians and universities in many countries to provide our customers with all the necessary data and support related to the product.

**Eco-Friendly**

TwinOxide® is environmentally friendly. The product is approved according to the worlds' most stringent national laws and regulations. Additionally, TwinOxide® meets the EU legislative framework for biocides and is NSF-60 certified in the USA.

Many other approvals of TwinOxide® were issued or are pending.

By providing a total process for water disinfection based on TwinOxide® we decrease the usage of chlorine and other traditional water disinfectants. This contributes to a better environment and to the general welfare of consumers by providing safer and healthier drinking water. When using TwinOxide®, less chemistry is required to achieve an optimized disinfection result!

## ...in a nutshell

### Microbiological and chemical advantages

- Powerful inorganic oxidizing agent and free radical with residual disinfection capacity;
- 99.9x% effective against all water-borne microorganisms (spore forming bacteria, viruses, protozoa, fungi and yeast);
- Very short contact time (2-10 minutes);
- Long residual disinfection capacity (up to 72 hours);
- High efficiency in the removal of iron and manganese compounds;
- Destroys algae-related taste and odor compounds;
- Higher yield (up to 260% more oxidation output compared to chlorine);
- Effectively removes prophylaxis on biofilms;
- Steady bactericidal efficacy within a broad pH bandwidth (pH 4 to pH 11);
- No build-up of resistance in microorganisms.

### Economic advantages

- More disinfection, less chemistry;
- No investment in a conventional ClO<sub>2</sub> generator;
- No ClO<sub>2</sub> generator maintenance and re-certification;
- Less security measures;
- Lower risk and liability insurance policy;
- Less training, certification and re-certification of qualified personnel;
- Environmental, health & safety factors;
- Lower hazardous material transportation costs;
- No additional chemicals (e.g. pH-level stabilizers) required;
- High material tolerance;
- No corrosion.

### Health and environmental advantages

- Does not react to water to form hypochlorous acid (no 'free chlorine');
- Unlike chlorine, TwinOxide<sup>®</sup> does not react with ammonia, ammonium or most organic compounds;
- Chlorite and chlorate building heavily suppressed;
- Eco-friendly, no undesirable residues;
- Single-product water cleaner and conditioner;
- Effective against airborne pathogens when 'misted';
- TwinOxide<sup>®</sup> does not chlorinate organic materials;
- Decreases THM's, HAA's, MX and other organic compounds with toxic or carcinogenic properties.

### Delivery mechanism

- 5 years guaranteed shelf life powder form;
- Extensive kinetic half time (>30 days) of the stock solution;
- Easy to apply (standard industrial dosage equipment);
- High solubility in water, can be applied in a very short time;
- Up to 72 hour biocidal life when added to water;
- Produces pure ClO<sub>2</sub>;
- High yield.



### Difference between TwinOxide<sup>®</sup> and chlorine & chlorine-type disinfectants

There is a significant chemical difference between TwinOxide<sup>®</sup> and chlorine and chlorine-type disinfectants (i.e. sodium hypochlorite). These products generate "free chlorine", also known as hypochlorous acid. This is the biocidal component that kills bacteria.

Free chlorine is released by chlorine and chlorine-type disinfectants when added to water. TwinOxide<sup>®</sup> does NOT contain free chlorine and works on the active molecule of chlorine dioxide. Although chlorine can be found in the name, the product is not a chlorine-type disinfectant. TwinOxide<sup>®</sup> does not release free chlorine to provide disinfection. When TwinOxide<sup>®</sup> 0.3% solution is applied, the chlorine dioxide molecule kills the full spectrum of bacteria, algae, fungi, spores, protozoan, yeast, methanogens, viruses, etc.

TwinOxide<sup>®</sup> does not generate by-products and does not need other chemicals to do the job! Chlorine and chlorine-type disinfectants generate Disinfection By-Products (DBP). DBP's include carcinogenic compounds that are biologically harmful in minute quantities, e.g. TriHaloMethanes, Haloacetic Acids and Mutagen X. The precursors to generate TwinOxide<sup>®</sup> ClO<sub>2</sub> solution are fully compliant with the European Standard DIN EN 12671 which designates the stringent rules for purity and quality of chemicals used for drinking water disinfection.

## TwinOxide® Applications

With TwinOxide®, all your challenges in water disinfection can be addressed by one single product as TwinOxide® combines multiple functions such as biocide, slimicide, algacide, sporicide, fungicide and corrosion inhibitor.



Municipal drinking and waste water disinfection



Industrial waste water disinfection



Paper Industry



Maritime Industry



Fruit and vegetables



Microbiological control of oil wells and bores



Environment



Process water and CIP in food and beverage industry



Hospitals



Disinfection of fishing ponds, floors, equipment and instruments



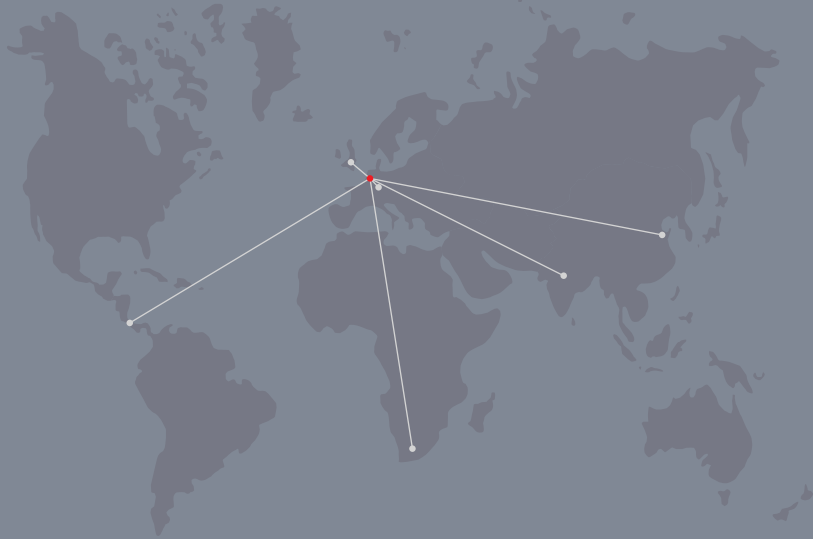
Horticulture



Livestock Industry

And also: Microbiological control of cooling and process water, THM control in pools and spas, sulphide destruction, pipeline and tank cleaning, removal of H<sub>2</sub>S, controls and reduces the biological load of effluent water, phenol oxidation and cyanide destruction, RO filter anti-fouling, carcass spraying, chilling water disinfection, etc.

TwinOxide® research and service desks:



Your local TwinOxide® distributor:



For more information about TwinOxide® and its global points of sale, you can contact your local TwinOxide® distributor or the headquarters in The Netherlands.



TwinOxide International B.V.  
De Maas 28, NL-5684 PL Best, The Netherlands  
Tel: +31-(0)499-329242, Fax: +31-(0)499-329620  
Email: [info@twinoxide.com](mailto:info@twinoxide.com)  
Website: [www.twinoxide.com](http://www.twinoxide.com)

 **TwinOxide®**  
*Total Water Disinfection Concept*

**TwinOxide® is the premier standard in ClO<sub>2</sub>!**