

# MERITO



*Commitment to a  
Cleaner Environment*



# merOxide

*Total Water Disinfection Concept*

# Chlorine Dioxide



Chlorine Dioxide has long been known as a disinfectant and a high-value biocide that has excellent biocidal properties. Many other disinfectants have several generally acknowledged hazards and disadvantages which chlorine dioxide does not have. The use of chlorine dioxide is increasing in the world of drinking water and sewage, as chlorine dioxide is very effective against bacteria including *Legionella pneumophila* and to prevent and remove biofilms. It is also finding use in more and more process applications due to its ease of use and environmentally-friendly nature.

Chlorine dioxide functions as a highly selective oxidant due to its unique, one-electron transfer mechanism where it is reduced to chlorite  $\text{ClO}_2^-$ . The end-products of chlorine dioxide reactions are chloride  $\text{Cl}^-$ , chlorite  $\text{ClO}^-$  and chlorate  $\text{ClO}_3^-$ . Chlorine dioxide removes substances that can form tri-halomethanes (THMs). The use of chlorine dioxide reduces the health risk of microbial pollutions in water and at the same time decreases the risk of chemical pollution and by-products. Chlorine dioxide is effective at a pH of between 4 and 10. The efficiency increases at high pH values, unlike chlorine whose efficacy reduces as pH increases.

By comparing the oxidation strength and oxidation capacity of different disinfectants, one can conclude that chlorine dioxide is effective at low concentrations. Disinfection with chlorine dioxide does not cause odour or taste concerns as it destroys phenols. Chlorine dioxide is more effective for the removal of iron and

manganese than chlorine. It has uses as diverse as oil industry sulphide treatment, bleaching of textiles and candles production. Chlorine dioxide is used most often to bleach paper.

As chlorine dioxide cannot be applied as a gas, several methods have been developed to generate chlorine dioxide and dilute it into an aqueous solution (water) so that the chlorine dioxide molecule could be applied as a disinfectant and oxidiser, however, production comes with many challenges. Chlorine dioxide is always generated on-site and with that production comes several challenges. The generators are not always affordable to smaller users, there is an explosion risk associated with generator pre-cursor chemicals if incorrectly mixed, and the efficiency of the reactors means much of the produced gas is wasted. Metito is able to offer an extensive range of chlorine dioxide options to meet all needs, large or small.

Chlorine Dioxide	Chlorine
Does not release free chlorine	Reacts with water and generates free chlorine (HOCl)
Very high disinfection against bacteria and viruses	Low disinfection against viruses
Rapid action - 1 to 10 minutes to act on microbes	Takes 1 hour to act on microbes
Minimal corrosion potential for system metallurgy	Highly corrosive in nature
High efficiency to oxidise iron and manganese	Very low efficiency to oxidize iron and manganese
Generates zero by products	Generates carcinogenic byproducts
2.5 times more powerful than chlorine	Less efficient oxidation
Does not react with ammonia, organics or phenolics	Forms THMs and gives potential taste and odour issues
Does not produce THMs	Activated carbon filters required to remove THMs
Does not spoil RO and ion exchange	Spoils RO and ion exchange membranes
Can be used to remove biofouling in membranes	Cannot be used to remove biofouling in membranes

# metOxide

As a leading water treatment solutions provider, Metito offers one of the most effective disinfectants (MetOxide) to all markets in the safest possible form.

From our application and formulation experience from around the globe, we have developed MetOxide which is a totally new technology to produce chlorine dioxide, eliminating all the problems associated with traditional generation. The product is 99.9+% pure chlorine dioxide in a liquid form with 0.3% concentration.

MetOxide does not react with ammonia, oxidizes iron, manganese and sulphides. MetOxide provides long lasting residuals and destroys the phenols, sulphide which can cause odour and taste problems. It can also be used in combination with other disinfectants. Neither temperature nor the alkalinity of water influence the efficiency of MetOxide.

MetOxide is suited to use in drinking water treatment in order to render legionella bacteria ineffective.

The quality and purity class of the ingredients and additives used in the MetOxide components are of extremely high standards. As water contamination levels vary, it is easy to vary the dosage rate of MetOxide to reflect oxidative demand. The ingredients and additives used in the components are fully compliant with the EN 12671 on quality of water disinfection and are fully approved according to the most stringent law on drinking



water in the world - the German TVO law (Trinkwasser VerOrdnung) on drinking water. There is no smell, no skin, eye or mucous tissue irritation (swimming pools/showers) and MetOxide is effective over a wide range of pH (4 to10) and does not react with bromides to form hypo-bromites.

MetOxide is easy to transport by road, sea and air. MetOxide is completely different from all known concepts to generate chlorine dioxide, as it is delivered in a two-component powder form (MetOxide A & MetOxide B).

## Benefits of MetOxide over other traditional Chlorine Dioxide generator systems:

- Zero explosion risk
- No generator required, spares or maintenance
- Non-corrosive generation
- Generates a 0.3% solution with 99.9% purity
- Kinematic half time of greater than 30 days
- No chlorites, chlorates, chloroforms generated
- No acid activator required
- Shelf life 5 years versus 2 years of other chemical approaches
- Easy transportation and handling of powder pre-cursors



# Applications For **meto**xiDe



## Municipal drinking and waste water disinfection

- Disinfection of drinking water
- Taste & odour control
- Avoid bromate formation in desalination seawater in potable water works



## Industrial waste water disinfection

- Destruction of microorganisms
- Taste and odour control
- Destruction of phenols



## Paper industry

- Disinfection of used water
- Iron control
- Effective against aerobic & anaerobic bacteria



## Fruit and vegetables

- Cleaning of fruit and vegetables
- Sanitizing of milking machines



## Oil and Gas industry

- Bacteriological control of drilling
- Disinfection of pipelines and tanks
- Disinfection of used water
- Used in cleaning bores



## Environment

- Odour control
- Bacteriological reduction



## Hospital

- Total disinfection
- Disinfection of surfaces & removal of Legionella



## Fishing industry

- Use in ice production
- Disinfection of surfaces & process water



## Reverse Osmosis

- Control biofilm formation
- Increased salt passage



## Livestock industry

- Cleaning of carcasses
- Disinfection of surfaces



## Maritime industry

- Disinfection of drinking water
- Removal of biofilm
- Water circuit treatment



## Food industry

- Disinfection of process Water
- THM control
- Disinfection of surfaces