

## HORTICULTURE

**Reduced contamination level and improved production performance and profitability**

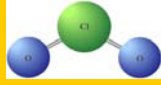

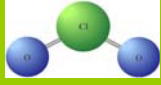

The only way to address and eliminate biofilm risks is to strip the biofilm, prevent its re-growth and kill the microbial contamination



### **Benefits *dutrion*<sup>®</sup> "golden" Chlorine Dioxide:**

- Very fast and long active in waterlines compare to other disinfectants being used for cleaning water systems
- Does not have pH limitation and is not corrosive on equipment
- Final elimination of (waterborne) pathogens in water systems
- Effective & fast sanitation program with spraying & fogging
- Bacteria, algae and fungi control on rooted or un-rooted cuttings and cut flowers, seedbed soil and planting cubes
- Treats, controls, inhibits algae and fungi in greenhouses and irrigation lines, filter systems, walls, ceilings and floors
- Easy to apply, easy to monitor and very safe
- Very cost effective compare to all other disinfectants
- **LOW INVESTMENT COSTS TO START**; use existing dosing pump
- Does not react with ammonia to form chloramines

### **Advantages *dutrion*<sup>®</sup> for Horticultural applications:**

<u>GREENHOUSES</u>	<u>OPEN FIELD PRODUCTION</u>
 	 
<p>Prevents clogged dripping systems                      Prevents cross contamination in recycled water                      Effective with higher organic loads                      Low concentrations do not harm fertilizers                      Controls algae growth in cooling systems                      Long active in water distribution systems                      Not corrosive on equipment                      Treatment of specific diseases with clo2                      Disinfection of floor, wall, pipe line, machinery                      Not phytotoxic to plants</p>	<p>Prevents clogged dripping systems                      Lower water evaporation from surfaces                      No pH limitations from 4-10 pH                      Penetrates deep in surfaces to eliminate pathogens                      Longer shelf life of treated fruits and vegetables                      Extra water flow into plants                      Clean lines for adding water soluble additives                      Always pure water till the far end                      Storage disinfection with clo2 spray                      Not phytotoxic to plants</p>
<p><u>EASY TO APPLY PER LINE OR WHOLE OPERATION</u></p>	<p><u>NO GENERATOR (risk, costs, insurance, extra labor)</u></p>
<p><u>UNIQUE WATER DOSING PROGRAM</u></p>	<p><u>LOWER DOSAGE REQUIREMENT WITH DUTRION<sup>®</sup></u></p>

**dutrion<sup>®</sup> powder**  
 most affordable and friendly  
**chlorine dioxide** solution for horticultural applications



## HORTI & PATHOGEN REDUCTION

### Benefits Chlorine Dioxide!

#### CLO2 Germicidal Spectrum

##### Bacteria

Pseudomonas Aeruginosa  
 Campylobacter Jejuni  
 Pseudomona Specie  
 Flavobacterium Species  
 Enterobarcer Cloaceae  
 Yersinia Enterolitica  
 Enterobarcter Hafnia  
 Clostridium Sporogenus  
 Proteus Vulgaris  
 Clostridium Dificile  
 Klebsiella Pneumoniae  
 Clostridium Perfingens  
 Salmonella Typhi  
 Fusobacterium Nucleatum  
 Salmonella Enteritidis  
 Bacilus Subtilis  
 Salmonella Gallinarum  
 Bacilus Circulans  
 Salmonella Typhimorium  
 Bacilus Megatarium  
 Salmonella Choleraesuis  
 Bacilus Cereus  
 Salmonella Typhosa  
 Bifedibacter Liberium  
 Corynebacterium Nucleatum  
 Staphylococcus Aureus  
 Sarcinae Lutae  
 Staphylococcus epidermia  
 Streptococcus Pyrogenes  
 Streptococcus Faecalis  
 Strep 1, 2, 3.  
 Mycobacteroi Bovis  
 Mycobacterium Smegmatis  
 Mycobacterium kansaaii

- Removal of biofilm which hinders efficiency of equipment
- Longer life of equipment, less down time
- Consumer confidence and acceptability
- Disinfection (sterilization) capabilities are not diminished at all in the presence of fats, oils, proteins, body fluids etc. because it has very selective and very few chemical reactions
- Strongly soluble in water, therefore, it has a long-lasting residual which reduces the potential for cross infection or re-contamination
- Broad spectrum, fast acting disinfectant, effective against a wide range of bacteria, spores, fungi, and viruses at relatively low concentration and short contact periods
- It is colorless, has a mild medicinal odor and removes if any odor, low corrosively to metals and the lowest acute toxicity rating from EPA
- High efficacy against E.coli, Salmonella, Listeria, Aspergillus, Penicillium, Staphylococcus etc. etc. etc. (see spectrum)
- High efficacy is obtained irrespective of pH
- Non-corrosive and non-staining of equipment
- Easy to apply and to monitor
- Meets HACCP (food safety) management requirements
- Cost Effective in many applications

#### CLO2 Germicidal Spectrum

##### Fungi

Candida Albicans  
 Trichophyton Rubrum  
 Scopulariosis Species  
 Aspergillus Niger  
 Trichophyton Mentagrophytes  
 Aspergillus Flavus  
 Mucor Species  
 Fusarium Specie  
 Saahromyces Cerevisiae  
 Fonsecaea Pedrosoi

##### Virus

Herpes Virus I  
 Poliovirus  
 Herpes Virus II  
 Encephalomyocerditis (EMS)  
 Adenovirus Echovirus  
 Vaccina Virus  
 Coxsakievirus  
 Vesicular Stomatitis Virus (VSV)  
 Influenza  
 Para Influenza  
 Feline Parvovirus  
 Bluetongue Virus  
 Mouse Flu  
 Mouse Hepatitis Virus (MHV)  
 Minute Virus of Mice (MVM)  
 Mouse Encephalomyelitis Virus  
 New Castle Disease Virus  
 Mouse Polio Virus (MEV)  
 Iridovirus  
 Pertiviries – Togaviridae

##### Others

Vidrio Cholerae  
 Culex Quinquifasiatus  
 Mycoplasm



The chlorine dioxide process is "extraordinarily" better than other methods to eliminate pathogens in water sytems.



Powerful Water Treatment