



# BIOXIDE® Solution for Odor Control

Water Technologies

**SIEMENS**



## BIOXIDE® solution is a safe, easy to handle method of odor control

To meet the needs of the industry, Siemens Water Technologies offers our BIOXIDE® solution for the elimination of odor, corrosion and safety problems associated with hydrogen sulfide in wastewater collection systems and treatment plants. BIOXIDE® solution is a unique, proven product because it achieves sewage odor control naturally, rather than chemically. This process eliminates the odor, prevents corrosion and overcomes safety concerns associated with atmospheric hydrogen sulfide.

### How BIOXIDE® solution works

BIOXIDE® solution is a process which controls hydrogen sulfide odors and corrosion biologically. Introduction of nitrate oxygen via addition of BIOXIDE® solution into a waste stream creates an environment in which certain naturally occurring bacteria thrive. These bacteria utilize the dissolved hydrogen sulfide which is present as a part of their metabolism, thereby cost effectively removing any dissolved hydrogen sulfide from the wastewater. As a result, BIOXIDE® solution both removes dissolved hydrogen sulfide and prevents its formation.

In addition to hydrogen sulfide, BIOXIDE® also combats most other odors commonly found in wastewater treatment systems.

BIOXIDE® solution has a proven track record for controlling hydrogen sulfide in a variety of collection system applications, with hundreds of installations throughout the U.S. Dissolved hydrogen sulfide concentrations of over 50 ppm are reduced to <0.1 ppm in the most severe applications.

### Why treat hydrogen sulfide?

The human nose is extremely sensitive to the presence of hydrogen sulfide (H<sub>2</sub>S) and detects it "as the smell of rotten eggs" in concentrations as low as 0.0001 parts per million (ppm). Hydrogen sulfide is often an indicator of the presence of other odors as well as a potential corrosion problem. Corrosion is caused due to the acidic nature of hydrogen sulfide.

In underground sewers or other wastewater collection systems where visual inspection is not easily accessible, the development and concentration of hydrogen sulfide causes offensive odors and corrosion can often go undetected until significant damage or failure occurs.

### Benefits of partnering with Siemens include:

- Wide range of odor control technologies; Siemens can provide a single product or combinations of products and treatment methods to provide the most cost effective solution available.
- Unmatched level of experience developed through decades of service, successfully solving thousands of odor problems.
- Regional service branch locations offer rapid response to your needs.
- Advanced technologies for controlling dose-to-demand at previously unattainable efficiencies.



## Advantages of choosing BIOXIDE® solution

### Contains no hazardous substances

One of the primary factors which should be taken into consideration when selecting any process for use in wastewater treatment systems, is the safety of those who will be handling the materials. Many options to control or eliminate odor compromise safety by reaction and flammability. Their storage and handling is often hazardous and costs are high, making them economically impracticable. BIOXIDE® solution is the only leading method of treatment for dissolved hydrogen sulfide which is not on the EPA CERCLA list of hazardous substances. This means that BIOXIDE® solution is safe for underground storage and is well suited to provide effective and affordable odor control throughout the entire collection system.

The use of BIOXIDE® solution releases no hazardous substances to the environment, nor does it expose workers or the public to potentially dangerous situations.

### Reduces Biological Oxygen Demand (BOD)

BIOXIDE® solution achieves odor control biologically and therefore, an additional benefit of its use is sewage BOD reduction. Benefits of reduced BOD include increased treatment capacity in plants otherwise limited by BOD loading.

### Treats other common sewage odors

Hydrogen sulfide is normally the predominant sewage odor problem. However, other odorous sulfur compounds such as mercaptans and organic sulfides can also contribute to odor problems. The biological environment created by BIOXIDE® solution will effectively remove these problem compounds as well.

### Arrests corrosion

Collection system and treatment plant equipment and structures of concrete or metal are severely corroded by atmospheric hydrogen sulfide. While no product can reverse the damage already caused by existing corrosion, BIOXIDE® solution reduces further corrosion by effectively eliminating dissolved hydrogen sulfide, the source of atmospheric hydrogen sulfide.

### Family of BIOXIDE® solutions

#### BIOXIDE® AE solution

BIOXIDE® AE solution is a patented product developed to take advantage of the benefits of our BIOXIDE® solution along with the addition of extra alkalinity into the process to increase the benefits of using one or the other chemical solution alone.

#### Ideal applications for BIOXIDE® AE solution include:

- Treatment systems where additional alkalinity is beneficial
- Low-velocity collection lines
- Biosolids storage

#### BIOXIDE - AQ® solution

BIOXIDE - AQ® solution is a patented product which combines our BIOXIDE® solution with the addition of AQUIT® solution to form a powerful hydrogen sulfide removal and prevention system. BIOXIDE - AQ® solution partially blocks the ability of anaerobes to utilize sulfate as an oxygen source and slows biological generation.

#### Ideal applications for BIOXIDE - AQ® solution include:

- Collection systems with long detention times
- Low-velocity collection lines
- Biosolids storage



## When compared to alternative methods, BIOXIDE® solution excels in efficiency, safety and cost effectiveness

There are many different technologies that can be applied to control odors from wastewater collection and treatment systems. These technologies can be split into two main groups; vapor phase technologies, used to control odorous compounds in the air or gas and liquid phase technologies, used to control odorous compounds in the liquid wastewater itself.

### **BIOXIDE® solution vs. chemical oxidizers**

Chemical oxidizers such as chlorine, hydrogen peroxide and potassium Permanganate are commonly used to control hydrogen sulfide odor. When compared to BIOXIDE® solution, these chemicals pose high reactivity and flammability risks, thus requiring expensive storage and handling techniques and equipment to overcome safety hazards.

In addition, chemical oxidizers trigger a chemical, rather than a biological, reaction within the system. The oxidizing mechanism of these products is not specific to hydrogen sulfide and therefore, excess dosage (compared to theoretical) is typical. This contributes to the relatively higher cost.

### **BIOXIDE® solution vs. pH adjustment**

If using sodium hydroxide to adjust the pH level and the level becomes greatly elevated, this method may kill many helpful organisms present in the sewage and detriment plant operations.

Furthermore, caustic treatment used for pH adjustment cannot be sustained on a continuous basis. In contrast, BIOXIDE® solution is suited for continuous treatment making it a much more effective, and consistent method of odor control.

### **BIOXIDE® solution vs. metal salts**

Metal salts are typically an economical treatment method for dissolved hydrogen sulfide control, however, in being specific to the removal of hydrogen sulfide only, they commonly leave other odor compounds untreated. BIOXIDE® solution provides equivalent treatment and cost effectiveness, but does so in a natural manner which also affects additional odor causing compounds. BIOXIDE® solution also provides BOD reduction.

### **BIOXIDE® solution vs. vapor phase treatment**

Vapor phase technologies, such as adsorption systems or air scrubbers, control odors by ventilating and treating the atmosphere in one geographic area. BIOXIDE® solution controls odor compounds within the sewage, thereby preventing their release to the atmosphere. BIOXIDE® solution prevents the odor problem at its source, while vapor phase technologies treat the problem after it already exists. BIOXIDE® solution also eliminates the severe corrosion caused by atmospheric hydrogen sulfide, making it a significantly more effective means of reducing corrosion than vapor phase treatment.

### **BIOXIDE® solution vs. bacteria addition**

The addition of volumes of "new" bacteria is not effective in controlling hydrogen sulfide because the sewage is not conducive to their growth. The difficulty in achieving consistent dosage and lack of stability contribute to the ineffectiveness and high cost of bacteria addition. The BIOXIDE® solution process provides the nutrients via a stable, easily metered aqueous solution, which promotes the growth of naturally occurring bacteria within the sewage collection system.



### Full Service Odor Control

Siemens Water Technologies is a recognized leader in the development of innovative products for the control of odors in wastewater collection and treatment systems. We offer a full range of treatment options, including our proprietary BIOXIDE®, AQUIT® and ODOPHOS® solutions, as well as other proven technologies for addressing odor. Due to site variation, there is no single best solution, nor is there a “one size fits all” approach to solving every odor and corrosion control application. Siemens' treatment recommendations are based on data collected at your site and may include one or more odor control products to achieve the best results and in a cost effective manner. With a complete selection of odor control products, Siemens can customize the right solution for your specific odor control problem. And, should your odor control system require follow-up service, Siemens extensive field experience and operational expertise are available from one of our local service branch locations.

### Services available for Odor and Corrosion control

- Installation Assistance
- Preventative maintenance and service contracts
- Process evaluation and optimization services
- Rehab and retrofit services
- Analytical and laboratory testing
- Plant control and instrumentation upgrades
- System survey and sampling
- Remote monitoring
- Parts and expendables
- Temporary/emergency odor control systems

Siemens Water Technologies delivers cost-effective, reliable systems guaranteed for quality, safety, and compliance. Our trained service staff is available to make sure your system is running at peak performance and to your specification. For your water treatment system, choose the partner that is committed to taking care of the world's water...and yours.

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MS-BIOXIDEdr-BR-0309  
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