

CLO2-3000®

**SURGITech**

Leave No Drop Behind



## Skin Damage Removal Using CLO2-3000®

CLO2-3000® is a powerful yet safe oxidizer & biocide which has multiple benefits in oil & gas applications.

### Features & Benefits

- Destroys downhole bacteria colonies
- Removal of biofilms in produced water, surface pipelines and SWD injection wells
- Sterilization of frac water prior to injection
- Acts as an H2S scavenger
- Bio-degradable and breaks down into simple salt water
- Reduces oilfield corrosion issues
- Bacteria will not develop a resistance to CLO2-3000® as can happen with other chlorine based biocides
- Because of its selectivity, CLO2-3000 can disinfect at concentrations that are up to 100 times lower than commonly used oilfield biocides.

### What is CLO2-3000®

- CLO2-3000® consists of a 3000ppm concentration of chlorine dioxide gas suspended in water
- CLO2-3000® can be safely generated on-site or manufactured at one of SurgiTech's regional offices and shipped to location
- The product can be added to water for topside applications or injected into the reservoir to address downhole issues
- Approved by the US EPA, FDA and World Health Organization for drinking water disinfection
- The active ingredient in CLO2-3000® is an EPA registered biocide used in drinking water preparation.

### Uses

**Increase Well Performance:** CLO2-3000® is highly effective at removing plugging material such as bacteria, bio-films, polymers and iron sulfide scale which may be inhibiting oil & gas flow to the wellbore.

**Black Water:** CLO2-3000® is a powerful oxidizer that destroys sulfate reducing bacteria (SRB) in produced water.

**SWD Well Treatments:** CLO2-3000® can either be applied to produced brine at the surface prior to injection or applied in batch to a salt water disposal well to eliminate existing subsurface issues.

**Iron Sulfide Removal:** The traditional treatment for iron sulfide scale is basic hydrochloric acid (HCL). The problem is that after the HCL is spent, PH rises above 2 which may cause components to recombine and precipitate scale in the pore space. By adding CLO2-3000® to an iron sulfide scale treatment, a water soluble sulfate compound is created which can be safely flushed out of the formation.

**Frac Water Disinfection:** Because CLO2-3000® does not react with a majority of the organic contaminants found in water, the product focuses on spore and bacteria destruction while being used in concentrations that are up to 100 times lower than traditional biocides. As CLO2-3000® degrades, it turns into salt water so there are no long term residual products to be seen as harmful contaminants.

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## Product Specifications

CLO2-3000® is a 3000ppm solution of pure chlorine dioxide and water. The product can use filtered, produced water onsite as the feedstock or fresh water can be used when preparing the product. Potassium chloride (KCL) can be added for resistance to clay swelling. Surfactants can be specified as per customer's requirements. CLO2-3000® can also be blended with SurgiTech's EcoSyn-174® synthetic acid and be used as a powerful iron sulfide scale remover.

The base product has the same freezing and boiling points as fresh water and is slightly corrosive to bare steel. The chlorine dioxide that is the active ingredient in CLO2-3000® is a yellow-green gas which is toxic if inhaled in high concentrations.



## High-Efficiency Delivery Method

CLO2-3000® can be used in the field with traditional delivery methods like backside liquid squeezes, as part of a frac fluid or through straddle packer injections but it is also tailored for skin damage removal and bio-remediation using SurgiTech's *NitroDyne*® gas delivery process. Using the **Nitro-Dyne**® process, CLO2-3000® is converted from a liquid to a fog of 30 micron droplets which are then carried down-hole using our high velocity, hot, inert gas treatment. The treatment gas is injected at 2-3 times the velocity of typical frac rates and carries CLO2-3000® to the rock face where the resulting low-viscosity gas/fog mixture can more easily penetrate the pore space.

In traditional biocide treatments, a large enough volume of biocide needs to be used to cover the entire perforated interval. On long laterals, this can make treatments cost prohibitive and all of that fluid needs to be pumped back out of the well. With the **Nitro-Dyne**® process, the wellbore and near wellbore pore space is first purged of fluids and then the CLO2-3000® fog is introduced to the formation with minimal dilution. The combination of a high injection rate and a low viscosity fluid, results in deeper reservoir penetration than traditional squeeze delivery processes. This ultra-deep delivery process should yield better overall results with minimal flowback of unspent product.

Recommendations given in this data sheet are based on tests believed to be reliable. However, the use of the information is beyond the control of Surgitech, Inc., and no guarantee, expressed or implied is made to the results obtained if not used in accordance with directions or established safe practice. The buyer must assume all responsibility, including injury or damage from the misuse of the product as such, or in combination with other materials. This bulletin is not to be taken as a license to operate under or recommendation to infringe any patent.

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