

Frequently Asked Questions for Beer Applications Selective Micro Clean from Selective Micro Technologies

What is Selective Micro Clean?

- Selective Micro Clean is greater than 99% pure solution of chlorine dioxide in water. Selective Micro Clean is produced by a patented micro-reactor sachet, which is designed to generate a specific amount of chlorine dioxide when water is added. Selective Micro[®] incorporates the micro-reactor into simple-to-use end products.

How do I use Selective Micro's products?

- Introduce Selective Micro's chlorine dioxide solution into the tanks, lines, kegs, and other equipment used in beer preparation, storage, transfer and dispensing operations. Then, soak and flush. It all comes down to concentration and contact time. With typical use concentrations of 5 to 50 ppm and contact time of one to 20 minutes, chlorine dioxide will decontaminate the equipment to be back online in less than one hour. Selective Micro products come in the form of a self-contained pouch or a sachet. Simply add water to the pouch to generate a specific volume and concentration or add a sachet directly to your volume of water.

Why use Selective Micro's products over alternative treatments?

- The products are an effective, non-corrosive and quick rinsing alternative to other decontamination agents on the market today. Chlorine dioxide has less than ½ the oxidation potential of ozone, and is 36% lower than bleach. But, because chlorine dioxide can gain 5 electrons, it has a higher oxidation capacity than bleach, ozone, or peroxide.

In other words, chlorine dioxide has more capacity to remove organic matter. In addition, because it is more selective to key organics, it is less corrosive to system components prone to oxidation. Finally, because the chlorine dioxide is actually a pure gas in water, it will rapidly rinse from the system leaving no residue, typically with less than one volume of rinse water.

Has chlorine dioxide been used before?

- Chlorine dioxide has been recognized as an effective biocide for decades, and is used in a range of hygiene related applications worldwide. Municipal water systems have used chlorine dioxide to treat drinking water for over 50 years.

Why couldn't I use chlorine dioxide before?

- Introduced in 1999, Selective Micro Clean is produced from patented technology that generates on-site greater than 99% pure chlorine dioxide. Prior to Selective Micro Clean, complicated, expensive mechanical generators or relatively impure “stabilized” solutions were the only ways to make chlorine dioxide. The expense of complex capital equipment and the corrosiveness of the lower quality “stabilized” solutions prohibited the development of many professional and consumer point-of-use applications.

I thought I used chlorine dioxide before, but it was “stabilized” chlorine dioxide, not “generated” chlorine dioxide. What is the difference?

- The term “stabilized” chlorine dioxide is a misnomer. Products labeled as such are proprietary formulations incorporating sodium chlorite and “activators” that are acids. Conversion rates for chlorine dioxide run from 1 to 10%, and are typically proportional to the amount and strength of the acid added to the sodium chlorite solution. For instance, adding citric acid would make the solution more acidic than adding lactic acid. These solutions are commonly referred to as acidified-sodium chlorite solutions. This name is more accurate and appropriate as chlorine dioxide only accounts for a small portion of the solution. Acidified-sodium chlorite solutions do not separate out reaction byproducts, so the majority of constituents in the solution are contaminants, not chlorine dioxide. For instance, a typical “stabilized”-chlorine dioxide solution contains 3.2 ppm chlorine dioxide, 3 ppm chlorate, and 134 ppm chlorite, at pH 3.04.
- Generated-chlorine dioxide solutions go through two steps - the generation of the chlorine dioxide and the separation of it from the reaction byproducts. As of now, this type of chlorine dioxide solution can only be made using mechanical generators or Selective Micro Technologies’ proprietary micro-reactor, found in all Selective Micro products. Chlorine dioxide solutions made these ways are exceedingly pure and conversion rates are easily above 80%. A 500 ppm generated-chlorine dioxide solution may contain only 0.60 ppm chlorite and 0.20 ppm chlorate (the detection limits for these two ions), at neutral pH.

How often do I need to use Selective Micro's product?

- Regular treatment is important because fouling of lines and equipment occurs naturally after any decontamination procedure. A regular maintenance schedule will help prevent unscheduled downtime due to contamination. Experience has shown that companies using Selective Micro's products have seen a significant reduction in the frequency of unscheduled downtime due to contamination, and some companies have increased the time between scheduled decontamination.

What is the shelf life of Selective Micro Clean?

- In the unopened package, Selective Micro' products have a shelf life of two years. Once the product is activated, use Selective Micro's solution within 15 days. Store activated solution according to instructions on label (cool place, out of direct sunlight, apart from food).

Will Selective Micro damage my equipment?

- Compatibility testing at 5 ppm and 100 ppm has demonstrated that Selective Micro's products are compatible with most metals and plastics and should not damage operative equipment reservoirs or water lines. At typical use concentrations, Selective Micro does not have detrimental effects on most materials, excluding some elastomers. Compatibility of specific materials should be tested prior to extended contact. More information regarding compatibility can be found at selectivemicro.com.

Will Selective Micro corrode my stainless steel kegs?

- Corrosion concerns can arise from several characteristics of a potential sanitizer, such as solution pH, reaction-byproduct contamination, and compatibility issues with the active ingredient. Selective Micro' solutions, like all generated-chlorine dioxide solutions, are at a neutral pH and so do not cause corrosion by being acidic. Selective Micro's products are a generated-chlorine dioxide solution, so as a result of the separation of reaction by-products (such as chlorates, chlorites and chlorides), the solution has extremely low contaminant concentrations. Chlorine dioxide has no compatibility issues with stainless steel.
- In order to produce any useful amounts of chlorine dioxide, acidified-sodium chlorite solutions ("stabilized"-chlorine dioxide solutions) are activated with an acid, which shifts the pH below neutral to acidic. The resulting acidic solution can cause corrosion. Also, high levels of reaction byproducts, such as chlorites, chlorates and chlorides are included in the solution. Such levels of chloride ions (which form salts in solutions) contribute to setting up electrochemical potentials, which advance corrosion.

Can I sanitize my bottle caps with Selective Micro?

- Chlorine dioxide is a food-contact hard surface sanitizer at 5 ppm for 1 minute. At this low concentration and contact time chlorine dioxide expresses compatibility issues with very few materials. Compatibility of specific materials should be tested prior to use.

Is there a test for concentration and rinse out of Selective Micro?

- Chlorine dioxide is easily detectable. For quick on-site verification, Selective Micro offers test strips that quickly and accurately detect concentration and rinse out.

Are Selective Micro's products toxic?

Selective Micro Technologies has done toxicity testing with the solution its micro-reactors produce. Some of these tests and their results include:

- Dermal Sensitivity: Protocol No. P328 EPA (FIFRA) and FDA. The activated solution is not considered to be a contact sensitizer at 700ppm.
- Acute Oral Toxicity: Protocol No. P320 EPA (FIFRA) and FDA. The single dose acute oral LD₅₀ of the activated solution is greater than 5,000mg/kg of bodyweight in male and female rats. The product is considered Category IV, the least toxic of the four categories.
- Acute Inhalation Toxicity: Protocol No. P330 EPA (FIFRA). The LC₅₀ of the activated solution is greater than 2.07mg/L in male and female rats.

These studies were done by Product Safety Laboratories, Dayton, New Jersey, as per arrangement with the EPA. More information can be found at selectivemicro.com.

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