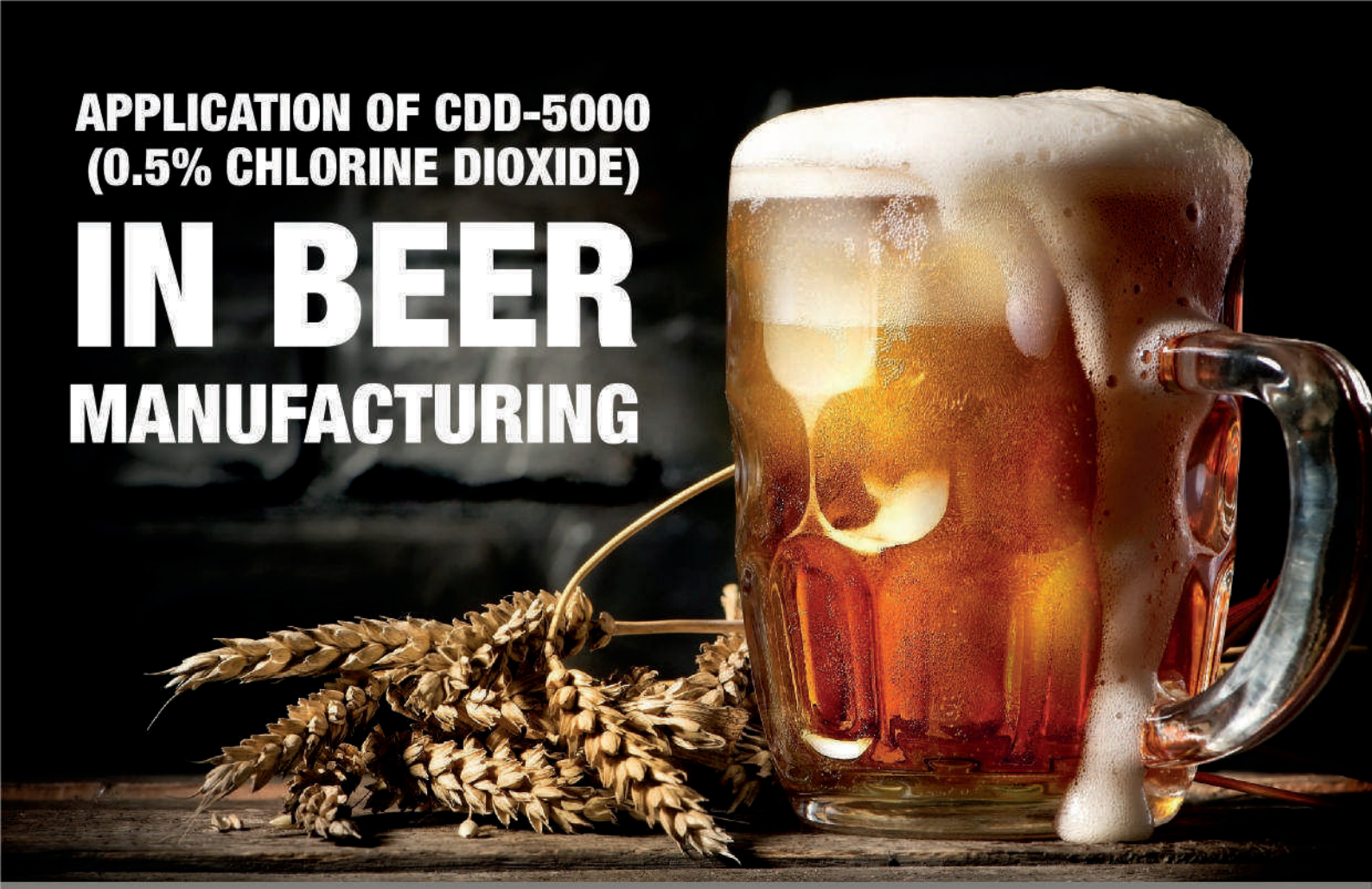
APPLICATION OF CDD-5000 (0.5% CHLORINE DIOXIDE) IN BEER MANUFACTURING



A brewery process presents one of the biggest challenges possible to a microbiological control program. Microorganisms are responsible for both the production and the degradation of the product. Microbial control is also critical for production and filling equipment.
A brewing environment offers the following applications where chlorine dioxide may be employed.

Cleaning in Place (CIP):

The most obvious application is that of the principle terminal sanitizing rinse in the CIP systems of the brewery. This is where the power of the chlorine dioxide molecule comes into play, demonstrating its broad spectrum, fast killing antimicrobial activity. It should be noted that chlorine dioxide fails to leave toxic residues which may inhibit fermentations. Due to its unique chemistry, chlorine dioxide does not chlorinate and therefore produces no chloro-organic, toxic by products. Chlorine dioxide has been shown to possess virucidal properties as well as bactericidal, helping to avoid dead vats. Chlorine dioxide may be used as a final sanitizing rinse till 100 ppm in breweries. A chlorine dioxide solution is dosed into the CIP system at the common sanitizer injector point as with any conventional sanitizer.

Pasteurizers, Bottle/Can Warmers, Coolers:

These waters are usually semi-closed loop systems, which are essentially open to the atmosphere and readily undergo contamination. Further, through the process of spills and broken bottles/ containers, they possess a significant organic load, thus creating a high potential for biological load. Slime and odor causing microorganisms cannot just survive, but flourish in these waters.

There are considerable economic, esthetic and health reasons for keeping these waters in a sanitary condition. Except for the “hot” section of the pasteurizer, the systems that hold these waters are susceptible to biofilm build up. This effect will produce a condition called heat transfer resistance in the heat exchanger elements of these systems, resulting in wasted energy and money. In addition, biofilms will cause clogging and restriction of lines, orifices and pumps, again causing inefficiencies and wasted money on down time and repairs. Among all biocides, chlorine dioxide has the best track record in effectively removing biofilm from systems. Another costly factor with these waters is their ultimate discharge to the drain. The longer these waters can be retained in a sanitary condition, the more money is saved in water costs, water discharge, and energy required to heat up the replacement water. The final and best reason for sanitary water is that the consumer expects their food containers to be processed in a sanitary environment, and will not tolerate otherwise. Typically halogen based (chlorine, bromine) compounds display a high degree of corrosiveness over time, in some cases relatively short times. Chlorine dioxide solutions from Applied Oxidation are no more corrosive than plain water and are completely compatible with phosphate based anti-corrosion water treatment products commonly in use with these systems. Depending on the configuration of the systems, chlorine dioxide can be periodically batch loaded into the water system at a final concentration of 5 ppm,or can be metered in on a timed basis during the process day.

Filler Head Assemblies:

One of the most challenging areas to permanently maintain a sanitary condition is found in the filler head assemblies. This is a critical point in the process because of its high potential for contamination of product. In the midst of this whirling equipment, changing pressures, product spills, slime build up, strong drafts and air currents, the liquid product has its most likely chance of exposure to contamination, particularly microbial contamination. The filler head assemblies are considered food contact surfaces, and often do contact food directly. Because this area is under almost constant threat of contamination, the standard cleaning and sanitizing of the heads during the normal sanitation process, while extremely important, may not be sufficientlyadequate to insure a sanitary condition throughout the processing day. Certainly a thorough cleaning, with close attention to product build up, debris accumulations and biofilms in andaround the filler heads, followed by an application of chlorine dioxide, will produce the optimum conditions at the start of the production day. However, the real challenge is in maintaining a fresh clean environment within the filler head assembly during production. Low dose applications of chlorine dioxide misted onto the filler assembly during short scheduled breaks in the production day, have proven to be of considerable benefit. Automatically applied via misting heads, levels as low as 5 ppm significantly improves the sanitary condition of the immediate area. For sanitation of filler head assemblies and surrounding housings, clean the area as normal with a good detergent and rinse thoroughly. Apply chlorine dioxide at 100 ppm, using a cold flood or cold spray application, whichever is most appropriate. Allow to air dry before bringing equipment back on line. To apply chlorine dioxide onto the filler head assembly during short breaks in the production day, it is recommended that the application be a fine mist of 5 ppm. Spray heads can be affixed onto the existing structure or framework surrounding the filler head assembly. A pressurized system or other appropriate device may be used to process and deliver the solution to themisting nozzles. A simple timer is used to control the misting burst to approximately 5 – 10 seconds. No potable rinse is required.

Mold and Odor Control of Environmental Spaces

There are many places within the brewery, which harbor mal odorous and musty smells, due in large part to mold growth. This is frequently the case in the storage cellars or Government Cellar, where temperatures and humidities are near ideal for growth of these organisms. Bacterial, mold and odor control is easily restored by an initial application of chlorine dioxide from 200 to 500 ppm, depending on the severity of the problem, sprayed onto the wall and floors. Follow this initial application with a periodical maintenance dosage of 100 ppm. When spraying solutions of chlorine dioxide into the environment, an approved chlorine dioxide face mask should be used. See our Occupational Health and Safety Data Sheet for more information.

Sanitation of Rail Tanker Cars

As with any food contact surface, the quality and shelf life of the contained beer is directly related to the cleanliness and sanitary condition of the vessel. Because tanker cars are large volume, confined vessels, they can be difficult to clean and sanitize. The problem again is biofilm build up, which can serve as a source of bio-contamination to the product. The cleaning step, which removes a high percent of biofilm, none-the-less must be followed by a sanitizer capable of penetrating and disrupting the remaining layers of the biofilm. A thorough sanitizing rinse of chlorine dioxide with close attention to overhead surfaces, at a concentration of 100- 200 ppm has proven to both improve the quality of product, and extend significantly its shelf life. The rinse solution should be allowed to drain and then air dried, before loading product. Do not rinse with potable water, since this may tend to re-contaminate the surfaces.