

Vegetable Canning and Freezing Plants Reduce Bacteria Counts and Dangerous Disinfection By-Products with PureClO₂ Generators



GOAL

- » Decrease bacteria counts
- » Reduce disinfection by-products
- » Eliminate on-site storage of Cl₂ gas and other hazardous chemicals
- » Maintain consistent levels of ClO₂ in processing/transport water

SITE

Fresh vegetable canning and freezing facilities in the midwest.

HISTORY

In recent years, these vegetable processing facilities had been burdened with issues regarding the poor disinfection of product processing waters (transport cooling water). For several seasons, these facilities had experienced inconsistent disinfection of these processing waters. While the plants relied on chlorine gas/chlorite ClO₂ systems to disinfect their critical processing waters, bacteria counts often exceeded management's targeted levels. In addition, the plant's existing generation systems may have contributed to the formation of disinfection by-products that not only adversely affected the taste of product, but jeopardized each facility's ability to comply with the Environmental Protection Agency's Disinfectants and Disinfection By-Products Rule.

The Problem

Although the processing facilities had relied on chlorine gas/chlorite ClO₂ generators to keep critical bacteria counts in check, plant personnel realized that the systems were not reliable when it came to generating a consistent quality and quantity of chlorine dioxide. The generators occasionally fed only chlorine gas—not chlorine dioxide—into the process stream if the supply feed rates were not closely monitored. Not only did the chlorine gas fail to adequately reduce bacteria counts to mandated levels, it may have adversely affected the taste of the company's products, and contributed to off-spec product not meeting mandatory specifications. In addition, there was concern regarding the prolonged use and storage of Cl₂ gas cylinders at each of its facilities.

As a result, it became imperative that the unreliable generation system be replaced. It was determined that a newer multiple-precursor system would not ensure the consistent generation of pure ClO₂. Peracetic Acid (PA) was also evaluated, but eliminated from consideration because it would be too costly considering the total volume of water to be treated, and it would require the bulk storage of hazardous materials.

The Solution

The vegetable processing facilities turned to PureLine Treatment Systems' innovative PureClO₂ Electrochemical Generators to safely and effectively disinfect their process waters. Using PureCide as a single precursor, PureLine's patented generation technology produces a 99.5% pure, chlorine-free ClO₂ solution on site and on demand. This high-purity ClO₂ is pumped into the process stream via a conventional pump to effectively kill a wide variety of microbial contaminants without producing disinfection by-products. In the food industry, PureClO₂ Generators are ideal for disinfecting incoming make-up water for vegetable flume wash treatments, disinfecting recycle water, and reducing membrane bio-film formation in cheese and whey protein concentrate applications.

Working with Chaska Chemical Company, Inc., PureLine Treatment Systems' innovative PureClO₂ Electrochemical Generators were successful in consistently reducing bacteria counts and disinfection by-products at three vegetable freezing plants located in the Midwest. The PureClO₂ HP-10 and HP-20 Generators were selected to meet the needs of these two facilities. The PureClO₂ HP-10 produces up to 10 pounds of pure chlorine dioxide per day while the PureClO₂ HP-20 produces 20 pounds of pure chlorine dioxide per day. Like all of the models in the PureClO₂ series, the HP-10 and HP-20 models have been engineered for safe, simple and reliable operation. A proportional integral derivative (PID) loop takes the guesswork out of dosing. With the PID control, the accurate dose of 99.5% pure chlorine dioxide is delivered when it's supposed to be. Its remote on-off capability offers process feedback control.



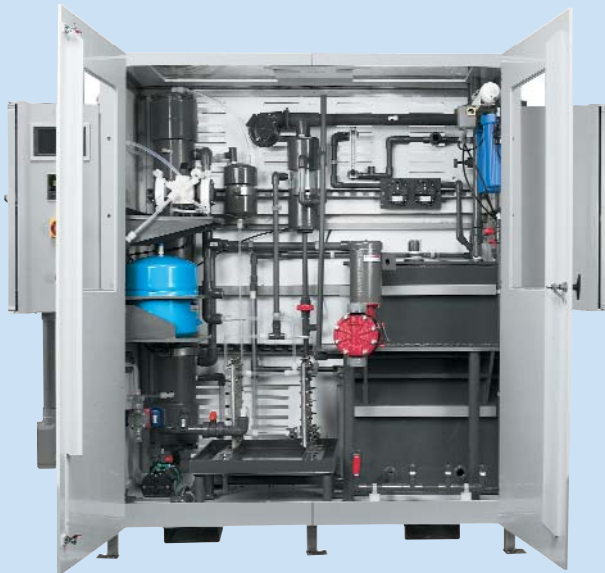
PureClO₂TM HP-20

Pure Results

Within days of each installation, the PureClO₂ Generators had successfully reduced each processing plant's bacteria counts to the mandated levels. Since the PureClO₂ Generator delivers pure chlorine dioxide rather than the mixture of ClO₂ and Cl₂ produced by the previous generation technology, the vegetable processing plants dramatically decreased the level of disinfection by-products. By generating 99.5% pure chlorine dioxide on site and on demand, the PureClO₂ HP-10 and HP-20 Generators freed plant management from serious safety concerns regarding the storage of Cl₂ gas at its facilities.

In addition, maintenance is no longer a headache for the plant personnel who once struggled with the unreliable performance of the plant's original chlorine gas/chlorite ClO₂ system. Every PureClO₂ Generator is fully supported by PureLine's exemplary customer service. Today, maintenance for the units consist of a regular start-up check at the beginning of the canning season and shut-down at the end of canning season, and freeze protection for winter lay-up.

PureClO₂ Generators are available in 3, 10, 20 and 40 lbs/day capacities, making them ideal for a variety of food industry applications.



CONCLUSION

PureLine's PureClO₂ HP-10 & HP-20 Generators have provided a safe, reliable and cost-effective solution to disinfection problems the vegetable processing facilities had struggled with due to an unreliable chlorine gas/chlorite ClO₂ system. Using a single precursor—PureCide—the generators consistently produce a steady stream of 99.5% pure, chlorine-free ClO₂ solution on site and on demand—completely eliminating the need for Cl₂ gas, and with it, eliminating plant personnel's safety concerns regarding the storage of the dangerous gas. Now the plants use high-purity chlorine dioxide to effectively kill a wide variety of microbial contaminants without producing disinfection by-products. As a result, PureLine's innovative electrochemical ClO₂ generators have effectively reduced high bacteria counts to desired levels without creating trihalomethane and halocetic acids that could have adversely affected the taste of the company's frozen vegetables and contributed to losses due to off-spec products.



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