

# PureClO<sub>2</sub><sup>™</sup> Generator Reduces Legionella and Other Waterborne Pathogens Threatening Patients at Midwest Hospital



Midwestern United States

## GOAL

- » Reduce Legionella counts in the hospital's domestic hot and cold water system.
- » Minimize the risk of a Legionella outbreak among hospital patients.
- » Deliver a continuous, low residual dose of pure chlorine dioxide (ClO<sub>2</sub>) into the hospital's water system to kill contaminants.

## SITE

A large hospital in the Midwest.

## HISTORY

Legionella, a life-threatening microbial contaminant, was detected in the hospital's domestic hot and cold water systems. Because the contaminated water system was a source for dangerous waterborne pathogens, it posed a serious risk for a Legionella outbreak among hospital patients who already suffered from compromised immune systems. Not only was the safety of its patients in jeopardy, liability issues surrounding a potential Legionella outbreak meant the hospital faced the threat of expensive litigation and substantial monetary awards.

## The Problem

To remedy the problem, the hospital decided to use chlorine dioxide to disinfect its water supplies. Chlorine dioxide is well-known for its ability to penetrate bio-film and eradicate dangerous contaminants including Legionella. The hospital originally contracted one of PureLine's well-known competitors to install a chlorine dioxide generator. However, the competitor's unit proved unreliable and experienced repeated technical failures. With their unit constantly down, the hospital's hot and cold water systems remained plagued by the threat of Legionella and the threat of an outbreak among patients and hospital staff members. In addition, the operating costs associated with the competitor's unit far exceeded the capital cost of the equipment. Unsatisfactory service, coupled with the unit's unreliable performance and unacceptable operation and maintenance costs, forced the hospital to look for a better solution.

## The Challenge

The hospital turned to PureLine Treatment Systems to help it reduce Legionella in its hot and cold water systems. PureLine's patented electrochemical ClO<sub>2</sub> generation technologies produce 99.5% pure, chlorine-free ClO<sub>2</sub> on demand without producing any by-products. After assessing the hospital's needs, the PureLine team installed a PureClO<sub>2</sub><sup>™</sup> Generator. Using PureCide<sup>™</sup> 25 solution as a single precursor, the PureClO<sub>2</sub><sup>™</sup> Generator delivers pure ClO<sub>2</sub> into the hospital's water system. In addition to an anolyte loop and catholyte loop, the PureClO<sub>2</sub><sup>™</sup> Generator incorporates a third loop into the generation system, a gas absorption loop. In the gas absorption loop, gaseous ClO<sub>2</sub> is stripped from the stripper column by a gas transfer pump. The vacuum pump delivers the gas into a small self-contained ClO<sub>2</sub> absorber column where the ClO<sub>2</sub> gas dissolves into water. A metering pump then feeds the resulting pure ClO<sub>2</sub> solution from this column directly into a level-controlled storage tank. A return line from the top of the absorber column to the bottom of the stripper column allows any undissolved ClO<sub>2</sub> gas to recirculate around for another pass into the absorber column. A level controller maintains the ClO<sub>2</sub> concentration within the absorber column.

## Pure Results

Installation of a PureClO<sub>2</sub><sup>TM</sup> Generator was completed in September 2004. Producing thirty pounds of pure chlorine dioxide per day, the PureClO<sub>2</sub><sup>TM</sup> Generator has been extremely reliable with no down time since its installation. Pure chlorine dioxide solution is now being dosed into the water system based on a signal from a flow meter placed in-line in the domestic water supply line. This automated dosing system has proven to be simple, safe and completely reliable. Expensive repair fees and dangerous downtime have been eliminated with the PureClO<sub>2</sub><sup>TM</sup> Generator. Most importantly, the new generator ensures that the appropriate chemical balance is maintained at all times in the hospital's water supply to eliminate Legionella. Hospital administrators and technicians have greater peace of mind now that the threat of a Legionella outbreak has been eradicated.

The hospital has also realized substantial savings with the PureClO<sub>2</sub><sup>TM</sup> Generator. Since the PureClO<sub>2</sub><sup>TM</sup> Generator eliminates the need to replace expensive cartridges, operating costs for the PureLine generator are significantly less than those associated with the competitor's unit. Annual replacement of electrolytic cells and RO membrane are included in the cost of the chemicals and service provided by PureLine. As a result, the hospital estimates PureLine's PureClO<sub>2</sub><sup>TM</sup> Generator will save it \$10,000 to \$12,000 per year.



## CONCLUSION

Producing thirty pounds per day of pure chlorine dioxide, PureLine's PureClO<sub>2</sub><sup>TM</sup> Generator has effectively reduced Legionella levels and the threat of a potential Legionella outbreak at the hospital. The PureClO<sub>2</sub><sup>TM</sup> Generator provides safe, simple and continuous delivery of pure ClO<sub>2</sub> solution directly into a pressurized domestic water system without the need for an external storage tank. The consistent dosage of ClO<sub>2</sub> has reduced Legionella readings to undetectable levels in all of the hospital's domestic hot water outlets.

PureLine's electrochemical PureClO<sub>2</sub><sup>TM</sup> Generators are available in 3, 10, 20 and 40 lbs/day capacities, making them an ideal disinfection system for hospital applications.



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