

Water Treatment Case Study: ECA vs. Chlorine Dioxide

Case Study-

Summary

An international beer bottling plant experiencing microbial problems in product and process water undertook an independent assessment of two different disinfection methods. The two methods compared were Trustwater ECA (Electro-Chemical Activation) and Chlorine Dioxide. From previous well-documented experience, the costs and associated risks with Chlorine Dioxide were pitted against the costs and associated risks with installing a Trustwater ECA system. The Trustwater system is installed for over 12 months and has proved highly effective at removing and preventing biofilm growth for the plant and eliminating micro-counts following installation. When the total cost of ownership is taken into account it can be seen that the Trustwater system halves the cost of water treatment.

Installation Evaluation:

	E.C.A	Remark	Chlorine Diox.	Remark
Complexity:				
Complexity of the technology	2	More complex due to	4	Complex hazardous equipment
Complexity of the installation:	5		4	Handling of the chemicals
Complexity of the operation	5	Fully automated	3	Fully automated, bubble formation
Efectiveness dosing	5		5	
Risks	2	Low	4	Training & PPE required
Hygenic design	5		5	
HSE- issues:				
Product	5	Just salt	2	Dangerous chemicals
People	5	Just salt	2	Hazardous to people
Environment	5	Just salt	2	Dangerous/explosive and corrosive
Sustainability:				
Water footprint	5	Just salt	3	The production, storage and transport has a much higher environmental impact
Carbon footprint	5	Just salt	3	
Total Score	49		37	

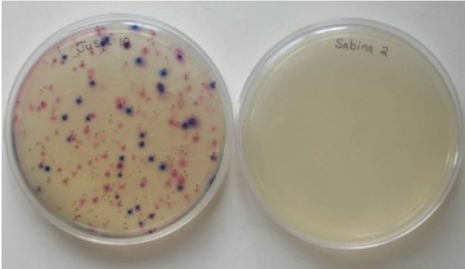
Evaluation Rating: 5 is the best score. 1 is the worst score.

Background

Prior to installing the Trustwater system, the plant quality assurance team found recurring micro-counts in the incoming water. The site previously had a sodium hypochlorite water treatment system however, this was not sufficient to control the bacteria. Biofilm build up was discovered in the tanks and distribution system. Despite increasing dosing levels of sodium hypochlorite and periodic shock-dosing, the biofilm was not removed and so micro-counts remained high with periodic spikes recorded. The plant contacted Trustwater and it was decided to install an ECA water treatment system and use the opportunity to undertake a detailed comparable study of ECA and Chlorine Dioxide.

Approach

A Trustwater AQ50 generator was installed with a dosing system. The system was found to be very easily integrated as a direct replacement for the existing system. Training was provided to staff on the weekly checks to be performed and the micro-count was recorded. It was initially recommended that because of biofilm build-up over time, a shock-dose of the entire system would be beneficial however, the decision was taken to by-pass the shock-dose and proceed with proportional dosing due to production requirements. Immediately following the Trustwater installation there was a step reduction of micro-counts in the water tanks and a gradual but steady decrease in the distribution network (a system shock-dose to remove the biofilm would have resulted in the same step reduction in all areas).

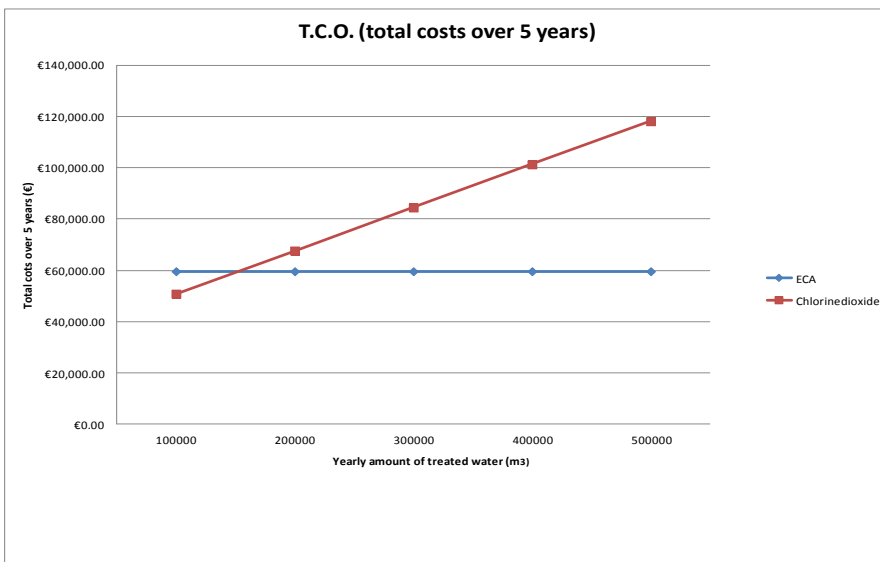


Step reduction in tank micro-counts

Result

The installation of the Trustwater ECA generator has proven highly successful in biofilm removal and water disinfection. In addition to this, the non-toxic nature of Ecasol improved staff safety with no dangerous chemical handling required. The Trustwater systems main advantage over chlorine dioxide is the removal of dangerous chemicals and the associated health and safety concerns and also the elimination of corrosion concerns on seals and gaskets through out the plant.

The financial cost of the two disinfection methods was also compared and when the moderate up-front equipment cost of a Trustwater ECA generator with it's very low on-going running and maintenance costs are compared to the chlorine dioxide system of low up-front equipment cost but high on-going running and maintenance costs the results are clearly evident on the cost of ownership model shown below.



- Trustwater Benefits:**
- Microbe-free water
 - Cost savings
 - Improved staff safety
 - Chemical elimination
 - Environmentally friendly

The graph shows that the cost of a Trustwater ECA system (at only €12,000 per annum) is less expensive than Chlorine Dioxide for all yearly volumes treated above 150,000m3 per year . For higher volumes the cost of running the Chlorine Dioxide system is more than twice the cost of the Trustwater ECA system.