



Danish Clean Water



The Installation: A Dairy processing milk based products and packaging them for distribution through retail outlets.



The Problem: The production process requires the product to be cooled quickly after the pasteurization and filling process. This is achieved by use of an ice slurry tank as a heat sink which ensures good heat conductivity away from the product and fast cooling to maintain the quality of the product and increase shelf life.

The cooling water/ice slurry mix is continuously recirculated and over a period of time biofilms developed.

This can create an ideal breeding environment for bacteria as a result of the product providing a nutrient source and ideal temperatures as a result of the product being warm. Whilst there is no danger of contamination of the product itself as the system is sealed in any food plant efforts are always made to reduce the bacterial load in the environment as a whole.

The presence of this bacteria even at low levels whilst not posing a pathogenic threat may detract from the quality of the product and so it was thought necessary to eradicate the problem. The existing technology that was used was based on the use of sound waves to physically disrupt the bacteria whilst this is a viable technology for killing the bacteria that pass through the equipment it has no effect on the biofilms.

The Solution: A T25 100 liter per hour low chloride disinfectant generator was installed producing into a buffer tank.



An ORP sensor was installed in the system and connected to a dosing pump. The set point for the ORP (Oxygen reduction potential) sensor was 550mv. At this level there should be no significant bacteria levels present. The pump starts and doses into the system when the ORP starts to drop below this level maintaining a continuous hygienic environment for the product.

A low chloride unit was selected to ensure that the system would not be subject to corrosion risk.

The disinfectant generator is equipped with an ethernet module which will send status warnings to the plant technicians should there be a failure or the salt levels in the brine tank become too low. This minimizes the risk of a production failure.

At the same plant it was also identified that there was a significant biofilm load in the cooling tower and it was decided to service both these installations with one disinfectant generator.

Operating costs: The generator consumes approximately 400g of salt per hour and uses about 1200w per hour. The generator runs for about 10 hours per day dependant on production levels. This equates to running costs of under €3 per day to service the ice slurry. The demand from the cooling tower/evaporator is similar resulting in total running costs of around €6 per day.

The Benefits:

- **Safety**
 - no need to mix or dilute hazardous chemicals
 - environmental friendly solution
- **Efficiency**
 - elimination of biofilms and inactivation of pathogenic microorganisms including Legionella species, and nil or low bacteria counts
 - creates a longer-lasting residual than traditional chlorination, often at a lower dosage
 - right dosage, no more no less – corrosion is reduced
- **Cost reducing**
 - the system is fully automatic and only requires minimal operator attention
 - no need for transport, handling or storage of chlorine gas or hypochlorite

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