Safer Sanitation, Better Solutions

Blog Series: Biofilm Part 3

FIGHTING BIOFILM WITH AWS GROUP

"AWS has a number of products formulated specifically to deal with Biofilm in the food processing industry. Foremost among them is ANK Neutral Anolyte. "

AWS Group's ANK Neutral Anolyte is classified as a neutral electrolysed water (NEW) as opposed to the acidic (AEW) and alkaline types. All three forms are types of electrolysed oxidising water (EOW) produced by passing an electric current through a saline solution of tap water. The most common salt used is sodium chloride but a mixture of potassium and magnesium chlorides is also used.
The three forms differ in pH, oxidation reduction potential (ORP) and available chlorine content (ACC) with the acidic and neutral versions being the most commonly used for pathogen control. They are produced at the anode while the alkaline version produced at the cathode is mainly used for cleaning.

ANK Neutral Anolyte is produced in a patented system where the anode and cathode are separated by reverse osmosis diaphragm and its main active ingredient the chlorine donating Hypochlorous Acid is produced at the anode and sodium hydroxide is produced at the cathode and siphoned off except for a tiny proportion required to keep the pH between 6.5 – 7.5.
The same reaction without the patented diaphragm produces acidic electrolysed water (AEW) which has the same active a but pH of 2-3.

The Hypochlorous Acid actives function with a similar action to that produced by Sodium Hypochlorite and Chlorine Dioxide but without the inherent safety and environmental issues associated with these other two.

Both neutral electrolysed water (NEW) and acidic electrolysed water (AEW) types have oxidation reduction potential ORP > 800(mV) and available chlorine content (ACC) of approximately 50mg/L but the more acidic AEW is less stable and far more corrosive in a food processing plant than the neutral electrolysed water (NEW) type like ANK Neutral Anolyte. This key difference is the main reason that the NEW technology is more prevalent in the food processing industry.

How does it work?

There are multiple theories on how electrolysed oxidising water (EOW) function on different types of pathogens and work is still continuing. The most common theory is that oxidation from the high ORP damages the biofilm cell wall allowing more than usual active chlorine from the hypochlorous acid to enter the pathogen. Once inside the cell the chlorine reacts with the nucleic acids and destroys key enzymes which de-stabilises the cells normal metabolic functions.

Neutral electrolysed water (NEW) types like ANK Neutral Anolyte are not only advantageous for problems around low pH and corrosivity but also their unchanged antimicrobial activity after storage. Recent research has indicated that although pH, ORP and ACC of both NEW and AEW types have changed under different storage conditions the antimicrobial properties of NEW remained unchanged whereas AEW decreased significantly.

Pictured above: Post harvest cleaning

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Other Food Industry Applications for ANK Neutral Anolyte:

As well as outstanding results as a hard surface sanitiser and disinfectant when used as supplied at 500 ppm neutral electrolysed water (NEW) is used extensively overseas on direct application to meat and vegetables as well as in processing water in the same industries. Research work is also being carried out for it's use in clean in place (CIP) for the milk and dairy industry.

- Surface Sanitiser: Used on stainless steel glass, ceramic tiles and some plastics the efficacy of neutral electrolysed water (NEW) is dependent on a clean surface and like all sanitisers dwell time. With sufficient dwell time enough colony forming units (CFU) will be destroyed so the sanitiser becomes a disinfectant.
- Vegetables & Fruit: Neutral electrolysed water (NEW) can be used pre & post-harvest without leaving significant residues of chlorine and affecting nutritional and sensory quality. A number of studies overseas are showing that the effects of using neutral electrolysed water (NEW) are having a positive outcome in wide variety of fruit and veg applications including wash water.
- Animal Products: Neutral electrolysed water (NEW) are used for washing eggshells and can also be used for washing chicken carcasses. Overseas research is being carried out on its use with fish and seafood to reduce bacterial contamination. This research extends to electrolysed water (EW) ice for storage of fish fillets in transportation and presentation in the retail sector.

To learn more about ANK Neutral Anolyte and our product range, visit our website at awsgroup.co.nz.

Pictured above: Envirolyte generator unit, generating ANK Neutral Anolyte onsite

Written by: Don MacDonald, AWS Group Technical Manger

Pictured above: Three of the five sizes available of AWS Group ANK Neutral Anolyte