FOOD ENGINEERING

Bottling plant meets strict chlorine residual requirement in pasteurizer

Since its founding in 1869, Torbitt & Castleman in Buckner, KY, has become the largest packer of private label syrups in the country. It is also a major supplier of preserves, jams, jellies and barbecue, steak and dipping sauces. To win a major national account, Torbitt & Castleman had to prove it could meet a strict chlorine residual requirement in its pasteurization process.

Maintenance Technician Jake Jeffries examines the pasteurizer's HRR-based chlorine controller from Stranco, Inc., Bradley, IL. Maintaining an HRR setpoint of 722 mV ensures a 2-3 ppm chlorine residual.

A few years earlier, quality control personnel periodically detected a thin layer of algae growth on the outside of glass jars following pasteurization, caused by bacteria growth inside the pasteurizer resulting from bottle overfill.

Cleaning kept the problem under control, but was very labor intensive. Also, Torbitt & Castleman did not chlorinate process water because the plant incorporates a continuous flow process using the city's potable water, with no refrigeration or recirculation. However, the customer required a consistent 2-3 ppm chlorine residual in the pasteurizer process water to ensure proper disinfection of bottles and caps. Operators would need to take hourly chlorine residual tests to verify this requirement.

In order to better control the chlorination process, the plant installed a chlorine controller developed by Stranco, Inc. The technology is based on High Resolution Redox (HRR) to regulate the demand for chlorine by monitoring the effluent ORP and modulate chlorine feed rates to meet that demand.

When microorganisms are destroyed through an oxidation process (such as chlorination), an electromotive force is generated, measured in millivoltage. This millivoltage is called ORP, or Redox. The strength of this force is directly proportional to the oxidative strength of the chlorine solution. The higher the concentration of chlorine, the higher the voltage.The higher the concentration of organics, the lower the voltage.

HRR-based chlorination control has prevented the old problem of algae growth in the pasteurizer. Cleaning requirements have been reduced to only once a month at one and a half hours maximum per cleaning, down from two to three hours every other day.

There has also been a substantial savings in water consumption. The water savings combined with labor savings has resulted in a simple payback on the new chlorination control equipment in less than 8 months.

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