

Case Study –

3-Step Pungent Flavor Changeover

Summary

A 5-line Carbonated Soft Drink bottling plant consists of 16 syrup tanks, 2 can lines, 3 PET lines and 1 Bag-In-Box line. The plant operates 24/7.

Background

This facility runs 832 pungent/sensitive changeovers per year. Each pungent flavor changeover is required for flavor and color removal, and usually required a 5-step CIP. The duration of each is between 150 and 180 minutes. Trustwater™ was challenged to test and validate a new rapid changeover protocol with the aim of reducing the lengthy changeover times in order to increase production time and afford the plant the opportunity to shift towards a 'Just-In-Time', lean manufacturing model.

Approach

A Trustwater™ generator and skid platform was installed with the necessary ancillary dosing and measurement control equipment. It was decided to replace the former 5-step CIP protocol with a shorter 3-step ECA protocol. The protocol involves sending Ecasol™ directly to the filler. Filler caps are not used and Ecasol™ is not returned, instead going to the floor drains in the filler room.

Step 1: Potable water rinse for 180s

Step 2: Ecasol™ at 30ppm FAC for 300s

Step 3: Potable water rinse for 300s or until FAC is 0ppm and TOA analysis passes.

The total duration of the 3-step Trustwater™ pungent flavor changeover is 20 minutes.

In order for the company to approve use of the 3-step changeover, it was necessary to validate as per the protocol below:

Validation Protocol for Changeovers with Trustwater™ Ecasol™

1. Clean a production line using the Ecasol™ process, documenting prior flavor, time, and chlorine concentration.
2. To evaluate production line changeover effectiveness, test and document the following parameters :

Ecasol™ Concentration	Test Ecasol™ solution at the filler during wash to ensure concentration level is achieved.
Ecasol™ Removal	Test final rinse for 0.0 ppm FAC
Taste, Odor, and Appearance of final rinse water	Perform a taste panel on the final rinse water to assure no off flavors, odors or colors
Taste, Odor, and Appearance of finished beverage	Perform a taste panel on the containers from the first commercial turn of the filler to assure no off flavors, odors or colors prior to production.
Taste analysis	For the first two changeovers from a pungent to a non-pungent, submit: <ul style="list-style-type: none">• two (2) finished product containers from the first commercial

	turn of the filler, and two (2) finished product samples from the end of the run to be used as a control.
Odor analysis of Rinse Water	<p>For the first two ECA sanitations per line:</p> <ul style="list-style-type: none"> • Submit four (4) samples of final rinse water from the filler for odor analysis. • Send four (4) samples of the final rinse water from a non-ECA sanitation to be used as a control.

3. Repeat step 1 and 2 (excluding taste and odor) a total of 10 times to collect the required Ecasol™ changeover data
4. Submit data for Ecasol™ changeover sanitation approval

Result:

The plant is now able to implement a pungent flavor changeover in 20mins. This has resulted in reducing downtime for the plant by 137,180 minutes per annum.

In terms of labor cost savings alone this has resulted in savings for the plant of \$242,985.60 per annum.

Changeover duration is so short that on occasion, production start-up has been delayed due to the previous product not yet being cleared from the line. The cost and requirement for PPE have all been reduced with no negative impact upon drains or waste water treatment.