

Case Study –

Comparison of 3-Step Cold CIP (Using traditional Chemicals) to Trustwater™ 3- Step ECA CIP

Summary:

It is generally accepted that a 3-step ECA cold CIP outperforms a 5-step hot chemical CIP in all areas resulting in savings in time, chemical costs, energy costs and water usage.

With the widespread implementation of 3-step cold chemical CIP models however, it is important that we assess the differences and compare the costs. For this reason a trial was undertaken to compare in detail the merits/demerits of both 3-step CIP processes – traditional chemical and Trustwater™ ECA. For the purpose of this trial, PAA (Peracetic Acid) was the chemical used in comparison with Trustwater™ ECA.

Background:

A leading beverage manufacturer in North America performing 72 CIPs/week agreed to the trial on their 3 line CSD plant. All figures featured in the following data are based on information supplied by the beverage manufacturer.

Both solutions were compared and analyzed in relation to CIP duration, cost, health and safety, environmental impact and return on investment (ROI).

Approach:

A Trustwater™ generator and skid platform was installed with the necessary ancillary dosing and measurement control equipment. Evaluations of the trial's success were based on effectiveness of production line changeover times and in relation to taste, odor and appearance of final product with all findings being tested and documented according to their rigid validation measures for trial protocols.

CIP DURATION:

Protocol for the two CIP processes:

- **3-Step ECA Protocol:**

		Duration
Step 1	Potable water rinse	180s
Step 2	Ecasol™ at 30ppm FAC	300s
Step 3	Potable water rinse*	300s

*rinse for 300s or until FAC is 0ppm and TOA analysis passes

TOTAL TIME: 3-step ECA Trustwater™ changeover: **20** minutes

- **3-Step PAA Protocol:**

		Duration
Step 1	Potable water rinse	300s
Step 2	PAA	900s
Step 3	Potable water rinse*	300s
	*rinse for 300s or until rinse is chemical free and TOA analysis passes	

TOTAL TIME: 3-step PAA changeover: **30-35** minutes

The table below reflects the actual number & types of CIP performed by this manufacturer and highlights acutely the time savings of the Trustwater™ 3-step ECA.

CIP Type	PAA	Trustwater™ ECA	Number of CIP/ week	Trustwater™ Time savings/ week
Quick Changeover	30min	20min	40	400min
Pungent changeover	30min	20min	14	140min
5 Step CIP	30min	25min	18	90min
TRUSTWATER™ ECA TIME SAVINGS/WEEK				630min

CIP Costs:

- **PAA**

Cost/gal/USD	Gal/CIP	Cost/CIP/USD	#CIP/week	Cost/week USD	Cost/yr /USD
20	5	100	72	7,200	374,400

- **Trustwater™ ECA** - As the Trustwater™ equipment is a capital purchase we have amortized the costs over a five year period. (Many customers amortize these costs over 8-10yrs giving even greater savings.)

	USD
Total Installation/Capital Cost	200,000
Amortization over 5 years	40,000/pa
Maintenance contract	12,000
Electrical and salt consumables	5,400
Total Cost per year	57,400
Total cost per week	1,103.80
Total Cost per CIP*	15.30

* Calculation based on 72 CIPs/week

Costs In summary:

PAA USD/yr	Trustwater™ ECA USD/yr
374,400	57,400

Health and Safety:

Trustwater™ ECA –

Trustwater™ Ecasol™ poses no health and safety concerns – Safety Data Sheet available.

PAA –

- It is a strict requirement that (PPE) Personal Protective Equipment and training is provided for all personnel coming in contact with PAA
- PAA poses a severe burn risk
- The filler room has to be evacuated during every CIP because of the gaseous nature of PAA

Environment:

Trustwater™ ECA –

Trustwater™ Ecasol™ is produced at pH neutral and is diluted to a concentration that has no adverse affect on drains or the waste water treatment plant.

PAA –

The low pH of PAA can adversely affect the drains and the waste water treatment plant often leading to the requirement of further chemical treatment to balance pH at additional cost.

Return on Investment:

Calculating the ROI based on replacement chemical cost alone sees the customer with a payback period for the implementation of Trustwater™ ECA in the 3-step CIP of less than 2 months.