



COP Savings in the Dairy Plant

COP (clean out of place) systems use a dedicated tank for storing and recirculating a wash solution to clean production equipment that is disassembled and placed in that tank. These tanks typically have a heat supply, a pump, and associated lines for recirculation which enhance the cleaning process. These tanks can range in size from 20 gallons up to, and even greater than, 2000 gallons. Some COP tanks are insulated, saving heat energy when storing and reusing the wash solution from day to day.

Traditionally, a COP wash solution is made up daily and discarded daily. Some plants will do an alkaline wash and an acid wash daily while others may do an acid wash only when needed (when there is scale on equipment). "One-step" cleaning products provide the following features resulting in saving water, time, energy, and chemical.

1. **Single use of an alkaline wash or an acid wash** but not both.
2. **Wash solution can reclaimed from day to day.** The duration of reclaim can be weeks to months depending on how well the equipment is rinsed, the type of products made, and the soil load of the wash solution. A daily make-up of 10-20% will help keep the soil load low enough so the wash solution will stay strong enough and fresh enough to maintain effective cleaning.
3. **Elimination of the acid wash and post wash rinse.**

The following is an example of savings generated by implementing a "one step" cleaning program on a 100 gallon COP tank with a daily make up of 10% and discarding the wash solution every six months. These are not theoretical numbers but, in fact, actual real case representations of systems in the field. I have worked with COP systems for four decades and with "one step" cleaning programs for over seven years. I must admit I was skeptical at first but, I was quickly convinced that these "one step" products have exceptional cleaning capability while providing significant savings of water, time, energy, and chemical.

Total savings:

1. Water: 290 gal/day, 6380 gal/month, and 38,400 gal/six months.
2. Time: 35 min/day, 13 hr/month, and 78 hr/six months.
3. Energy: 20 min/day, 7 hr/month, and 42 hr/six months that a pump is not running.
4. 15 min/day, 6 hr/month, and 36 hr/six months you are not heating a solution.
5. Chemical: \$15/day, \$330/month, and \$2000/six months.

It is important to note, saving time may be the most significant item in this group. Creating more time for an employee or for a production shift can have an enormous impact on productivity. For the employee it opens up opportunities to focus on and accomplish other tasks. For the production shift it may mean the addition of more production time.

Remember, "*New technology is new technology because of the science behind it.*" If you follow the instructions and parameters for using these "one-step" cleaning products they work perfectly.

Details of Calculating Savings



Reclaiming the alkaline wash:

1. Water savings:
 - a. The first day use 100 gallons of water for the initial charge and reclaim the solution.
 - b. Every day thereafter make-up 10% of the initial solution. This saves 90 gallons of water every day until the solution is discarded. A 22 day production month saves 1980 gallons of water per month.
2. Time savings: Let's estimate 15 minutes, the amount of time to fill the tank, heat the tank, and add chemical to the tank each day.
3. Energy savings: This savings would be the amount of heat energy it takes to heat 100 gallons of water from 50F to the reclaimed solution temperature in the insulated COP every day.
4. Chemical savings: 90 gallons of wash solution is reclaimed every day. The cost of charging 90 gallons of water with alkaline is about \$9.00 per day.

As mentioned above, traditional COP cleaning would have an alkaline wash followed by an acid wash. With the use of a "one step" cleaning product elimination of the acid wash would generate the following savings:

Elimination of the acid wash and post wash rinse saves water, time, energy, and chemical.

1. Water saved:
 - a. Wash solution: 100 gallons per day, 2,200 gallons per month, 13,200 gallons in six months.
 - b. Post wash rinse: 100 gallons per day, 2,200 gallons per month, 13,200 gallons in six months.
2. Time saved:
 - a. 15 minutes wash time per day.
 - b. 5 minutes rinse time per day.
3. Energy saved:
 - a. This savings would be the amount of heat energy it takes to heat 100 gallons of water from 50F to 150F (delta T of 100F) every day.
 - b. This savings would be 20 minutes of not running a pump.
4. Chemical saved: The cost of charging 100 gallons of water with acid is about \$6.00 per day.