



HTST Savings in the Dairy Plant

HTST (high temperature short time) systems use the HTST balance tank to make up a wash solution that is recirculated through the system. The HTST heat supply, pumps, lines, and controls are used to clean the system. These systems range in size from 100 gallons up to, and even greater than, 500 gallons.

Most HTST systems make up and discard both an alkaline and an acid wash solution every day. "One-step" cleaning products provide the following features resulting in saving water, time, energy, and chemical.

1. **Reclaiming the alkaline wash** from day to day for long periods of time. The duration of reclaim can be weeks to months depending on how well the equipment is rinsed before the wash, the type of products made, and the soil load of the wash solution. A daily make-up of 10-20% will keep the soil load low enough so the wash solution will stay strong enough and fresh enough to allow for effective cleaning.
2. **Reducing the post wash rinse step.** Remember, "one-step" cleaners **rinse free** of wash solution **faster** than traditional cleaners.
3. **Elimination of the acid wash.**
4. **Elimination of the rinse following the acid wash.**

The following is an example of savings generated by implementing a "one step" cleaning program on a 200 gallon HTST system that has a daily make up of 10% and discards 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 CIP systems four decades and with "one step" cleaning programs for seven years. I must admit I was skeptical at first but, I was quickly convinced of the ability these products to have exceptional cleaning capability while providing significant savings of water, time, energy, and chemical.

Total savings:

1. Water: 940 gal/day, 20,680 gal/month, and 124,080 gal/six months.
2. Time: 27 min/day, 10 hr/month, and 60 hr/six months.
3. Energy:
 - a. 27 min/day, 10 hr/month, and 60 hr/six months that a pump is not running.
 - b. 20 min/day, 7 hr/month, and 42 hr/six months you are not heating a solution.
4. Chemical: \$58/day, \$1,276/month, and \$7,656/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

1. Reclaiming the alkaline wash:

- a. Water savings:
 - a.i. The first day use 200 gallons of water for the initial charge and reclaim the solution.
 - a.ii. Every day thereafter make-up 10% of the initial solution. This saves 180 gallons of water every day until the solution is discarded. A 22 day production month saves 3,960 gallons of water per month.
- b. Time savings: no significant time saved.
- c. Energy savings: no significant energy saved.
- d. Chemical savings: 180 gallons is reclaimed per day. The cost of charging 180 gallons of water with alkaline is about \$40.00 per day.

2. Reducing the post wash rinse step time by 20% after the "one-step" wash saves water, time, and energy. Remember, "one-step" cleaners **rinse free** of wash solution **faster** than traditional cleaners.

- a. Water saved: reducing a 10 minute rinse by 20% saves 120 seconds. 120 seconds translates to 160 gallons of water saved per day.
- b. Time saved: 120 seconds saved each day.
- c. Energy saved: energy saved not running a pump for 2 minutes a day.
- d. Note: the exact amount of reduction in a rinse can be determined by measuring the pH at the drain during the rinse step. When the rinse water reaches 7.0 pH the rinse is done.

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

- a. Water saved: 200 gallons per day.
- b. Time saved: 20 minutes per day.
- c. Energy saved:
 - c.i. The amount of energy to heat 200 gallons of water from 50F to 175F (delta T 125F) and hold 175F for 20 minutes per day.
 - c.ii. The amount of energy saved not running a pump for 20 minutes.
- d. Chemical saved: The cost of charging 200 gallons of water with acid is about \$18.00 per day.

4. Elimination of the rinse following the acid wash saves water, time, and energy.

- a. Water saved: a 5 minute rinse saves 400 gallons of water per day.
- b. Time saved: 5 minutes per day.
- c. **Energy saved: energy saved not running a pump for 5 minutes per day.**