



Aveda Corporation



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Company Background

Aveda is a division of Estee Lauder Companies with a production facility in Blaine, MN. The location produces a variety of cosmetics, beauty, and personal care products for Aveda as well as other company brands, including hair color, lotions, shampoos, make-up, and many other products. The products are then sent to the Midwest Distribution Center, also in Blaine, for distribution to retailers across the country and around the world.



“Working with MnTAP has been an amazing experience. I’ve learned so much about working in industry, and I’ve broadened my skills to cover multiple types of engineering. I feel like I’ve been able to truly make an impact at Aveda, which could have a lasting impact on the community and environment as well.” ~ MP

Project Background

The project goal was to reduce water consumption and waste, with focus on clean-in-place operations (CIP), and the use and generation of purified water.

Incentives to Change

Aveda uses 22 million gallons of water annually at a total cost of \$283,000 per year, with 20% of the volume and 55% of the cost associated with the production of purified water for use in products and some cleaning steps. In addition, Aveda has important corporate goals to reduce environmental impacts of their operations.

“The MnTAP program has helped Aveda with a focused effort to find opportunities for water, energy, and material reductions throughout the facility. Aveda’s mission to ‘care for the world we live in’ is closely aligned with MnTAP’s values, which has made it possible for us to realize our opportunities and achieve our goals.”

*~ Dan Berry, Director of Facilities
Aveda Corporation*

SOLUTIONS

Sanitation Room Cleaning

The North Sanitation Room consumed 15% of facility water with just under half of that consumed by the ingredient bucket pre-rinse operation. Using more efficient nozzles for the pre-rinse will reduce water use by 640,000 gallons per year (40%), energy for heating water and speed up the process.

An improved spray ball installed to clean portable tanks, will reduce water use by 756,000 gallons per year (75%) as well as reducing energy for hot water.

Purified Water System Upgrades

Adding a variable speed reverse osmosis (RO) pump to the existing USP water purification system will lower the operating pressure until the whole system is replaced. This change will save 24,000 kWh per year and pay for itself in less than 2 years.

Aveda plans to replace the 18-year-old USP system because it is nearing its useful life from an equipment and technology standpoint. New system proposals were identified and evaluated that: double system capacity; adjust to demand to save energy; eliminate pH adjustment; and provide redundancy. The new system will reduce water consumption by nearly 1.5 million gpy and save

Solutions

32,000 kWh doing it. These savings would pay for the system in 18 years, not including productivity gains that are the main driver for replacement.

CIP Improvements

16 tanks have CIP water volumes determined by the location of the temperature probe that controls both CIP and batch temperatures. Adding a temperature probe to the recycle line on eleven tanks would reduce water use by 284,000 gpy and detergent use by 35,000 lbs, paying off the cost of change in 1.6 years. Payback is slower for the remaining 5 tanks.

Implementing new Gamajet nozzles on eleven tanks with manual CIP procedures should save 600,000 gpy, 35,000 lbs of detergent, and 4,900 hours of cleaning time that would then become available for production. This change would require installation of a



high-pressure USP water distribution loop, estimated at \$510,000. Water and detergent savings should be close to \$43,000 resulting in a payback of 12 years. The value of production time gained is expected to drive this change, but this was not quantified.

Water Softening

Replacing the current water softening system with a more efficient counter-current system should reduce water used for regeneration by 692,000 gpy and salt by 78,000 lbs per year. This would reduce costs by \$11,700 per year and payback the system cost in 7.3 years. The reduction in salt use would also reduce chloride releases to the environment – an emerging water quality issue.

Recommendation	Annual Reduction	Annual Savings	Status
New nozzle on sanitation room bucket washer	640,000 gallons 3,400 therms 31,000 kWh	\$6,900	Implemented
New tank washing nozzle in sanitation room	756,000 gallons 3,900 therms 25,000 kWh	\$13,000	Implementing
Add VFD pump to USP RO	24,000 kWh	\$2,500	Implementing
USP system upgrade	1.5 million gallons 32,000 kWh 11,000 lbs NaOH	\$37,000 + capacity	Planned
USP waste stream reuse	1.25 million gallons	\$6,600	Planned
Temperature probes in CIP recycle line (Part A)	284,000 gallons 26,000 lbs detergent	\$27,400	Recommended
New CIP cleaning recipe with Gamajet (Part B)	600,000 gallons 9,000 lbs detergent 4,900 hours	\$43,000 + capacity	Further investigation needed
Countercurrent water softener	692,000 gallons 78,000 lbs salt	\$11,700	Recommended

MnTAP Advisor: Karl DeWahl, Senior Engineer