



Aveda Corporation



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Company Background

Aveda Corporation is a division of Estée Lauder Companies with their production facility located in Blaine, MN, employing 750 people. The Blaine location produces a variety of cosmetics, beauty, and personal care products for Aveda, as well as other brands owned by Estée Lauder Companies. This includes hair color, lotions, shampoos, and many other products. Aveda has been a part of the Estée Lauder Companies since 1997.



“This internship gave me the opportunity to learn practical skills and gain industry experience outside of the classroom. Working for Aveda gave me an opportunity to work with a large process manufacturing plant, which is beneficial in starting my career as a chemical engineer. I also gained unique problem-solving skills and had the chance to work with several teams of varying disciplines, giving me insight into the many different aspects of engineering as well as environmental health and safety.” ~ BE

Project Background

The goals of reducing off-grade waste generation and energy consumption of the compressed air and chilled water processes align with Aveda’s mission of minimizing the environmental impact of their processes. Compressed air accounts for around 14% of the total electrical energy consumed by the Blaine Aveda facility annually, and compressed air use is estimated to include around 15 - 20% leaks. Reducing compressed air leaks and compressed air use can significantly reduce the cost of energy for Aveda. The chiller system accounts for around 18% of the total energy consumed by the Aveda facility annually and has not been updated in around 20 years. A new chiller system with improved efficiency can reduce energy costs and environmental impact, as well as improve the production process by supplying more consistent and lower chilled water temperature.

Incentives to Change

Aveda is an environmentally conscious company that produces personal care products and is always looking for ways to improve their processes while reducing environmental impact. Aveda participates in waste reduction programs such as a zero waste to landfill policy

and uses a Waste to Energy waste management system. Aveda products are also cruelty free.

Aveda is always looking for ways to continually improve their processes while also reducing their impact on the environment. Aveda is working to reduce its industrial waste generation and additionally will identify opportunities for water and energy efficiencies through various means including our chilled water and compressed air systems.

“Our MnTAP interns over the past two years have done a fantastic job of identifying energy and water opportunities. These individuals have been part of the team and worked to exhibit how these projects could help us to improve. We see MnTAP as a valuable resource and look to partner with them in the future.”

~ Jeff Eidenschink
HVAC Mechanic, Aveda Corporation

Solutions

Improve Air Compressor Energy Efficiency

The current compressed air system uses both constant and variable speed drive compressors. Variable frequency drive compressors are more energy efficient than constant speed compressors, as they have the ability to consume less power when demand is lower. By replacing the constant speed compressors with a single, variable speed drive compressor, energy efficiency can be optimized, saving energy and reducing energy costs. This energy reduction is estimated to save 55,000 kWh of energy and \$5,500 of associated energy costs annually.

Reduce Compressed Air Use

Leaks in the compressed air system account for 15-20% of all use. Implementing a maintenance program to check, report and repair leaks, and standardizing pressure regulators and fittings will eliminate wasted energy.

Other opportunities to reduce compressed air use include: replacing compressed air motors with electric, replacing end uses with electric blowers, and turning off air to production lines that are not in use. All together there is an opportunity to reduce 95,000 kWh and \$13,000 annually.

Improve Chiller Energy Efficiency

Heat recovery chillers remove heat from chilled water and use the rejected heat energy to heat water for the

plant's hot water processes. A new chiller system will have a larger total capacity to reflect the increased chilled water demand from production. This increase in chiller capacity will supply more consistently low chilled water temperatures, increasing production efficiency in jacketed cooling tanks. By replacing the current chiller system with a heat recovery chiller, the improved energy efficiency of the new chiller is estimated to save 130,000 kWh of energy and \$14,000 in energy cost savings annually, as well as increase production efficiency



Filter Liquid Waste Stream

Currently, off-grade waste is rinsed down the drain with hot water. Adding a rotating vacuum drum filter to the waste stream process will remove suspended solids in the liquid waste, separate and dry the solids. The separated solids can then be disposed of through the “waste to energy” program, in which

solid waste is converted to electrical energy instead of being sent to a landfill. This filter can reduce SAC and strength charges, as well as environmental impacts. This reduction option is estimated to save 18,000 gallons of water and 180 kWh per year, as well as save up to \$31,000 in energy costs and waste disposal fees.

Recommendation	Annual Reduction	Annual Savings	Status
Improve Air Compressor Energy Efficiency	95,000 kWh	\$13,000	Implementing
Replace Current Air Compressors with a Single Variable Speed Compressor	55,000 kWh	\$5,500	Planned
Replace Chiller with Carrier Heat Recovery Chiller System	130,000 kWh	\$14,000 + increased capacity	Planned
Procedure Changes to Off-Grade Waste Management System	18,000 gallons water 180 kWh 188,000 lbs water pollution	\$31,000 + \$170,000 product saved	Recommended
Nitrogen Generation In-house	--	\$19,000	Recommended

MnTAP Advisor: Michelle Gage, Engineer