



Faribault Woolen Mill Co.



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Organization Background

Founded in 1865, the Faribault Woolen Mill has been around for generations, producing quality fabrics such as blankets and scarves from start to finish. The longevity of this company has provided a consistent image in the community, especially due to the fact that it's now one of the few vertical mills in the United States. Much of the fabric-making process has stayed the same way for decades, which has allowed for both process technique and artistry to go into the making of products.



"My internship was an amazing experience. I was able to learn about an entirely new branch of production work as well as collaborate with knowledgeable staff on developing and implementing new projects. I was able to accomplish way more than I expected and am so grateful for this opportunity. ~ GMZ

Project Background

Vertical fabric mill textile manufacturing is a water intensive process. Faribault Woolen Mill consumes around 10 million GPY of water supplied by the City of Faribault. Mapping water use in the facility provides an opportunity to identify the major water consuming operations and prioritize the highest consuming areas for evaluation. This optimization will very likely allow both lower company costs and increased productivity.

With a production site that has been around over 150 years, much of the staff have been trained by knowledgeable members with years of experience. However, with production increasing the mill seeks an effective way to quickly and consistently train new employees. Additionally, the equipment used is often older but functional, so careful documentation of equipment operation and effective staff training on standard procedures will maximize productivity and help extend equipment life.

Incentives to Change

Investment in water efficiency will result in reductions of both municipal water and sewer costs as well as lower energy use from reduced water heating. Since the mill averages about 10 million gallons of water used annually at \$0.005 per gallon, water conservation will save the facility tens of thousands of dollars. Improvements in

standard work can allow for better consistency and fewer delays, which will lead to better work flow and overall productivity.

SOLUTIONS

Soap Reduction & Optimization

In discussion with vendors, it was discovered that the mill was using too much soap for fulling and washing that required excess water use to rinse out of the fabric. Soap use was gradually decreased with careful observation of product performance. A 75% reduction in soap and at least 68% reduction in water can be reliably implemented long-term. Overall savings will occur from reduced water usage and heating as well as from reduced annual soap costs. Reduction in rinse times will increase productivity due to quicker load processing.

Optimize Rinse Cycling

Since the wet processes (washing, fulling, and piece dyeing) utilize the most water from the plant, adjusting all three to the most efficient rinse process will save water. The most efficient way to rinse is to turn off the water until the tank is fully drained, and then to refill the rinse basin after. This standard operating procedure saves 4 minutes of water flow time per load. This results in a water savings of 300,000 GPY.

Solutions

Wet Process Documentation & Organization

This process will reorganize the methods for washing, fulling and dyeing such that steps for most specific cases of fabric processing are easily found and clearly detailed. By reorganizing existing documentation and collecting unwritten process information into easy to access binders and folders, wet processes can be completed with consistent high quality. This will allow for better preparations for batch consistency as well as improved worker training and accountability. The detailed work instructions allow new members to reference work patterns quickly and independently, saving time and maintaining worker focus on work tasks.



Water Heater Optimization

To better organize the simultaneous use of multiple washing or fulling machines, this solution will determine the optimal way to use the current water heater. This will not only allow for more efficient use of the limited heated water supply on busy production days, but also determine the limitations for future expansion. Calculations were completed to determine the number of washing processes that can run at any given time, and to develop a strategy of staggering wash cycles to ensure consistent hot water availability throughout the production day.

“Our MnTAP intern was professional, worked well with all our staff, and was diligent in her research. Through her project she was able to identify significant water conservation and annual savings for our company. Having a MnTAP intern for the summer was a great experience for our company and the staff members she interacted with. Our experience with this program was a very positive one and we would definitely participate in this program again. This was a great learning experience for everyone involved.”

*~Joyce Raesner, VP of Production
Faribault Woolen Mill Co.*

Recommendation	Annual Reduction	Annual Savings	Status
Optimize Soap Usage	3,500,000 gal water 17,200 lbs. soap 14,700 therm 650 rinse hours	\$65,900	Implemented
Optimize Rinse Cycling	360,000 gal water	\$3,000	Recommended
Document Wet Processes	Unknown	\$3,000	Implemented

MnTAP Advisor: Jon Vanyo, Engineer