



TEXTILE BRINE SEPARATION

BENEFITS

- Projected energy savings of 17.8 billion Btu annually at the plant
- The energy required to produce and transport salt will be cut in half
- Reduced air emissions, including greenhouse gases, due to reduced energy consumption
- Reduction of 150,000 tons per year of wastewater, 4,000 tons per year of salt, and over 500 tons per year of carbon dioxide
- Reduced wastewater generation and disposal needs of 1.1 million metric tons per year
- Decrease of \$800,000 per year in operating costs compared to conventional methods of textile production
- With 45 nanofiltration and recovery systems with equivalent wastewater volumes installed by the year 2010, total nationwide waste would be reduced by 7.3 million metric tons per year

APPLICATIONS

This technology applies to a variety of operations within the textile dyeing industry.

BRINE REUSE SAVES ENERGY AND REDUCES WASTE FOR THE TEXTILE INDUSTRY

The textile industry continually strives to minimize pollution, particularly when dyeing cotton and cotton blend fabrics where a large amount of salts and color dye pollutants are discharged into water. The current processes to remove these pollutants from wastewater are difficult and costly.

National Textiles, Inc., formerly Sara Lee Knit Products Corporation, uses a membrane technology in the dyeing process that recovers and reuses about 50% of saltwater (brine). Use of a polymer needed for conventional color treatment is also eliminated. This technology significantly reduces the amount of colored wastewater generated and the need for associated processing equipment. The overall volume of water to be treated is also significantly reduced. This volume reduction dramatically downsizes the entire water treatment cycle, and also reduces capital equipment expenditures and associated maintenance costs.

TEXTILE BRINE REUSE



A new membrane technology for dyeing cotton and cotton products reduces pollutants discharged into water by 50% and also reduces associated processing equipment costs.



Project Description

Goal: The goal of this project was to demonstrate the significant energy and waste savings that could be realized by employing nanofiltration technology to reuse textile dyebath brines.

The membrane technology, called nanofiltration, offers a means to recover reusable brine while also providing for more efficient wastewater treatment. It is used in conjunction with additional color removal methods. The basis of the nanofiltration methodology is to filter only selected "drops" of the dye cycle, which contain the majority of the waste load. Furthermore, the permeates that are recovered from the nanofiltration process, such as the salt separated from the dyes and suspended solids, are suitable for reuse in the dye cycle.

Progress and Milestones

- The membrane system was installed in January 1997.
- Waste dyebath water was treated from February through April 1997, and wastewater was introduced into the system in June 1997.
- The system has been operating with relatively few problems, and a final report was submitted in October 1997.



NICE³—National Industrial Competitiveness through Energy, Environment and Economics: An innovative, cost-sharing program to promote energy efficiency, clean production, and economic competitiveness in industry. This grant program provides funding to state and industry partnerships for projects that demonstrate advances in energy efficiency and clean production technologies. Total project cost for a single award must be cost-shared at a minimum of 50% by a combination of state and industrial partner dollars. The DOE share for each award shall not exceed \$400,000 to the industrial partner and up to \$25,000 to the sponsoring state agency for a maximum of \$425,000. Each award may cover a project period of up to three years.

PROJECT PARTNERS

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