

(9) Use of Pressurized Ozone and Compressed Air Flotation with Membrane Filtration for Industrial Process Water Treatment at a Forest Products Facility

In 18 months this project will demonstrate a membrane filtration system at a molded fiber paper mill. The process will reduce the amount of fresh water needed for mill operations. This project expands upon a complementary project, which focuses only on the ozone system in the plant stream. Integrating the ozone process with efficient membrane filtration will provide an overall efficiency not available with separate independent systems.

Background: Pulp and paper mills are very water-intensive and energy-intensive industries.

Significant energy, in the form of heat, is used to make hot water for the papermaking process. Water recycling in paper mills both conserves water and saves energy (by recovering the heat embedded in the hot water); the buildup of total dissolved solids (TDS) in process water restricts the proportion of water that can be recycled. TDS, or “salts” accumulate in process water when it is repeatedly recirculated and reused, and can cause crusting and clogging of spray nozzles and other detrimental impacts on the papermaking process. Typically, a portion of the recirculated water is purged via a “bleed-off stream” in order to expel some TDS from the water, and an equal amount of “make-up” water is added which must be heated. The raw materials used in papermaking are predominantly organic (e.g., components of wood), and the TDS inherent in papermaking process water is also predominantly organic (dissolved organic salts). Whereas, suspended solids/particles are easily removed from water by filtration and straining, dissolved salts are not. Organic materials can be oxidized through chemical reactions, yielding carbon dioxide and water as products. Ozone is a powerful oxidant, and can be used to control TDS in paper mill process water. Pactiv Corporation’s Plattsburgh, New York, mill produces 40 tons per day of recycled-fiber molded products for use in the packaging industry, and seeks to maximize the recycling of their papermaking process water. Currently, Pactiv discharges 250,000 gallons per day of “purged” process water. Through this project, the team will study the economic and technical feasibility of using an innovative integrated system consisting of pressurized ozone and compressed air flotation with membrane filtration to control TDS and suspended solids to an acceptable level. If the results of the study suggest that such a system is technically and economically feasible, the team will install and operate a full-scale system. This method of recycling process water and its potential energy and environmental benefits could be valuable to other industries and could be replicated by other industries that use large amounts of process water and are hampered by TDS and suspended solids, such as food processors and commercial laundries.

Total project cost: \$848,132

Funding request: \$380,750

Project Lead: New York State Energy Research and Development Authority

Project Participants: Michigan Department of Consumer and Industrial Services – State Energy Office; Pactiv Corporation

Patents: None.

Publications/Presentations: None

Progress in Past Quarter and Current Status: During these quarters (Q13 & Q14) complete installation, start-up, operation, and testing have occurred. Pactiv has submitted an invoice to NYSERDA for payment of eligible project expenses, and NYSERDA has made payment. Technical work on the project has been completed on time in accordance with the project completion date of June 30, 2007.

Plans for Next Quarter: The project has been completed on time in accordance with the project completion date of June 30, 2007. However, submittal of the project Technical Final Report has been delayed.

During Q15, Pactiv will submit a final report (technical report detailing project actions, outcomes, data, and assessment) to NYSERDA, and NYSERDA will furnish to NASEO for sharing with USDOE.