DIRECT ASSISTANCE PROGRAM

CASE STUDY

NYSP2I Identifies Process Options to Reduce a Costly Cleaning Waste for KIK Custom Products

KIK Custom Products (KIK), located in Cortland, New York, manufacturers and develops personal and hair care products along with providing manufacturing services for private label clients to produce detergents and other household products. As part of a global corporation, with leading positions in the multi-billion dollar household and personal care industry, KIK maintains close relationships with over 70 consumer packaged goods customers and virtually every relevant major North American retailer.

Challenge

KIK's Cortland, New York location manufactures wet goods such as shampoo, conditioner, lotion, and body wash in sizes of 2 oz. to greater than one gallon. KIK uses millions of gallons of water per year at a cost of over $1 million dollars annually. Over 40% of the water is used to clean thick products from tanks and other equipment. With tight requirements on the amount of surfactants and organics allowed through KIK's wastewater treatment facility, more than 700 tons of cleaning waste are sent off-site for disposal every year. KIK received support from the New York State Pollution Prevention Institute (NYSP2I) to evaluate their manufacturing and cleaning activities in an effort to identify potential opportunities for reducing cleaning waste quantities and avoid disposal.

Solution

NYSP2I assessed KIK's current processes and activities associated with generating cleaning waste to identify potential opportunities to reduce quantities through source reduction, reuse, or recycling. NYSP2I conducted a site assessment where production and waste generation activities were observed. KIK provided data and other information for the cleaning activities required after each product run to gain an understanding of waste generation and quantities.

The data gathered allowed NYSP2I to develop a process flow diagram identifying the flow of material, use of water, and generation of waste. NYSP2I also performed several tests to analyze the material properties of the cleaning waste. NYSP2I then evaluated methods to improve product recovery, potential operational modifications, and equipment adjustments. The improvements focused on production controls, automated cleaning systems, and alternative process equipment.

Results

After performing the on-site assessment, identifying liquid waste sources, and analyzing data, NYSP2I calculated the total cost of ownership for the disposal of cleaning waste and the lost revenue of potential product to be approximately $1.5 million annually. NYSP2I identified that over 40% by weight of the waste

CHALLENGE

- KIK wanted to evaluate their manufacturing and cleaning activities in an effort to identify potential opportunities for reducing cleaning waste quantities and avoid disposal

SOLUTION

- NYSP2I conducted a site assessment where production and waste generation activities were observed
- NYSP2I developed a process flow diagram identifying the flow of material, use of water, and generation of waste
- Tests to analyze material properties of the cleaning waste were conducted by NYSP2I
- NYSP2I evaluated methods to improve product recovery, potential operational modifications, and equipment adjustments

RESULTS

- NYSP2I identified that over 40% by weight of the waste content is water which is purified prior to entering the manufacturing process
- Waste disposal costs could be reduced by over 66% and overall waste quantities could be reduced by 65%
- NYSP2I identified product recovery improvement opportunities for consideration
- With reducing waste at the source, several benefits can be realized including reduced product waste, increased product for resale, a reduction in purified water use and cost, and reduced costs for disposal

KIK CUSTOM PRODUCTS

content is water which is purified prior to entering the manufacturing process. Conversely, potentially 60% by weight is lost product resulting in lost revenue. NYSP2I identified product recovery improvement opportunities for consideration by KIK:

- Implement methods to retain heat or insulate storage tanks to increase flow and reduce losses of high viscosity products. Cooling can dramatically increase viscosity of some products and therefore leave large amounts of residual product in the tanks.
- Slow the transfer pump speed with VFD controls (storage tanks to filling lines) to reduce heel losses of high viscosity product.
- When possible, move product directly from mixing tanks to filling lines to reduce double heel losses, double tank cleanings, and potential losses from cooling of high viscosity products while in storage tanks.
- Install and require the use of automatic pigging systems to recover product from transfer lines, rather than the current "optional" manual pigging system.
- Install cone bottom tanks for both storage and mixing tanks to reduce heel losses. As tanks need replacing, convert to cone-bottom when possible.
- Incentivize product recovery for tote bag losses to encourage using the tote bag emptying equipment.

Due to the high cost of using purified water that ends up in the waste, along with the lost product and revenue, any potential process modifications or capital improvements identified have a payback of under 2 years. Waste disposal costs could be reduced by over 66% and overall waste quantities could be reduced by 65%. With reducing waste at the source, several benefits can be realized including reduced product waste, increased product for resale, a reduction in purified water use and cost, and reduced costs for disposal.

TESTIMONIAL

"Everything about the experience with NYSP2I was professional and enjoyable. Through the half-year process, their team visited our facility several times, organized conference calls, and delivered the final report as intended. We provided insight and clarification to NYSP2I when needed, and better understood each other's parts of the "waste puzzle" than we had before. The final presentation and report is a comprehensive look at our liquid waste process: concrete ideas on how to improve it, and what strategies are best. Within the report are details for the engineers, and a thorough one-page ROI summary for the executives. The NYSP2I team is upbeat with positive energy, and were easy to work with. I will highly recommend NYSP2I to any manufacturing entity dealing with opportunities in waste reduction or pollution prevention."

– Paul Erickson, Operational Excellence Engineer
KIK Custom Products

NYSP2I PARTNERS

R·I·T Rensselaer University at Buffalo The State University of New York Clarkson University

New York Manufacturing Extension Partnership

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For more information please contact us:

111 Lomb Memorial Drive, Bldg. 78
Rochester, NY 14623

Tel: 585-475-2512
Web: nysp2i.rit.edu
E-mail: nysp2i@rit.edu

R·I·T Golisano Institute for Sustainability
ROCHESTER INSTITUTE OF TECHNOLOGY