

DIRECT ASSISTANCE PROGRAM



CASE STUDY

Evaluation of Energy and Water Use Cost Savings Opportunities

Knowlton Technologies, located in Watertown, New York is a world-leader in design, accelerated prototyping, and manufacture of wet-laid nonwovens in filtration, friction, and custom designed composite webs. Knowlton manufactures non-woven sheet material using the wet-laid process, where the final products include filtration media, composites, and high friction materials. The manufacturing process uses water as a carrier to make the sheet material. Then steam is used to dry the sheet material. In forming specialty materials, solvent is used as a carrier for other materials. The solvent is evaporated and sent to a boiler for steam generation. Residual liquid solvent is sent out as hazardous waste.

CHALLENGE

As part of the Lean, Energy and Environment (LE2) assessment, it was determined that waste solvent from the saturator contained unusable phenolic material and solvents. The amount of waste solvent was approximately 22 gallons per week. Due to the presence of the solvents, the waste solvent was being disposed of as hazardous (flammable) waste. The annual solvent waste disposal cost was approximately \$3,850 per year. Based on analysis of two saturator solvent waste samples, the waste solvent replacement costs would range from approximately \$3,900 per year to \$6,300 per year based on data. Therefore, total solvent losses per year ranged from \$7,750 to \$10,150 based on the combined purchase and disposal costs. One opportunity that was considered and needed to be validated was the use of distillation to recover usable solvent from the mixed solvent mixture.

SOLUTIONS

The New York State Pollution Prevention Institute (NYSP2I) evaluated opportunities related to water use reduction/recovery, energy use reduction, and toxics reduction. EMCOR Services-Betlem (EMCOR) was subcontracted by NYSP2I to assist in an energy assessment of Knowlton as part of the LE2 program. Working together with Knowlton, NYSP2I and EMCOR selected 4 energy conservation measures (ECMs) for evaluation based on initial screening. The four ECMs can potentially result in savings of 63,100 therms and 180,208 kWh per year while reducing their peak demand by 38 kW.

Solvent distillation was found to be a feasible implementation project for Knowlton, serving as a means of recovering solvents for reuse while simultaneously reducing their hazardous waste stream. Based on an average saturator solvent waste of 22 gallons per week, a small distillation unit (CBG Model 1500 Technoclean Recycler) was purchased from CBG for simple distillation of the solvent waste from the saturator.

RESULTS

The findings of the LE2 assessment showed that waste solvent recovery through simple distillation would reduce hazardous waste volumes while also reducing costs to purchase fresh solvent. Based on an average saturator waste volume of 22 gallons per week, a small distillation unit was found to have a simple payback ranging from 1.3 to 1.8 years. This estimate did not include labor costs to load and unload the distillation unit but it is assumed that the labor would cost the same as processing the waste solvent for shipping and hazardous waste disposal.

CHALLENGE

- Due to the presence of the solvents, the waste solvent was being disposed of as hazardous (flammable) waste
- The use of distillation to recover usable solvent from the mixed solvent mixture needs to be validated

SOLUTIONS

- NYSP2I evaluated opportunities related to water use reduction/recovery, energy use reduction, and toxics reduction
- Solvent distillation was found to be a feasible implementation project, serving as a means of recovering solvents for reuse while simultaneously reducing their hazardous waste stream

RESULTS

- The assessment's findings showed that waste solvent recovery through simple distillation would reduce hazardous waste volumes while also reducing costs to purchase fresh solvent

NYSP2I PARTNERS



University at Buffalo
The State University of New York



10 Regional Technology Development Centers

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