

Client Success Story: Detergent and Fabric Softener Producer

Company profile

Application: A detergent and fabric softener producer in the Central United States had numerous wastewater disposal issues resulting from the bottling of fabric softeners and detergents.

Wastewater Description: The wastewater contained diluted fabric softener, anionic detergents and wash-down waters from bottling change-overs. The waste stream also contained cardboard, small pebbles, dirt, paper fiber, plastic fragments and bottle caps.

Waste Disposal Goals: The client's goal was to recover the process waters so they could be discharged into the sewer with no permit and recover the fabric softeners and detergents for possible resale as off-specification products.

Wastewater treatment challenge

The client makes frequent product change-overs on their existing bottling lines. Large quantities of potable water are used to rinse the associated piping and plumbing between these product changes. Large volumes of highly diluted fabric softeners and detergents were being delivered to the local landfill. The wastes were often mixed with saw dust and other binding agents before land application.

CASTion solution

The client was spending \$1,000,000 annually for landfill disposal costs. The CAST distillation technology allowed for recovery of the fabric softener and the liquid detergents, recovered clean water for use in the cooling tower and opened the door for sewer discharge based solely on flow rate. The client projected a savings of \$1,000,000 in annual disposal costs and gained the opportunity to resell the concentrates. Staging the distillation systems reduces the normal operational costs by half and decreased the size of the heat and cooling sources. Cost to treat one gallon of wastewater was approximately \$0.10.

To help the client achieve their waste disposal goals, CASTion installed a CAST 12,000 GPD Staged Flash Distillation System constructed of fiber reinforced plastics, CPVC & PVC piping and valves. The CAST system treats 12,000 gallons per day (input) of mixed wastewater. The system



was configured so that the segregated fabric softener stream was delivered to one 6000 GPD stage, and the segregated detergent stream was delivered to the second 6000 GPD stage.

Waste segregation was accomplished utilizing two large holding tanks. The staged CAST system configuration allowed the heat energy recovered from stage one to be available for preheating the process feed in stage two. The goal was to concentrate the fabric softener and detergents to their original specific gravities using low temperature vacuum distillation. The only pre-treatment protocols employed were product segregation and particle filtration. No other chemical adjustments or pretreatment steps are taken.

A primary goal was to remove total dissolved solids and BOD5 to below the municipal discharge limits. This would allow the client to discharge the distillate directly to the sewer without monthly chemical loading surcharges. Actual samples of the CAST system distillate were analyzed for TDS and BOD5 by a local certified laboratory. The resulting TDS and BOD5 fell below the local discharge limitations (i.e., 2800 PPM and 1500 PPM respectively). Based on this testing, the client was granted a municipal permit based solely on flow rate.

The fabric softener and the anionic detergent are high boilers and represent the still bottoms. Both of these materials can be concentrated to the manufacturer's original formulation. These products are considered off specification and would not be reused or reintroduced into the virgin product. However, they can find markets for the off-specification material and would alter its odor and color before resale.

Product Purity:

Product	Diluted % Solids	Virgin Product % Solids	CAST Treated % Solids
Fabric Softener	2-3	32	28-33
Detergent	1.5	29	27-30

Distillate Purity:

Parameter	Wastewater	Permit Limits	CAST Distillate
TDS, PPM	5000-6000	2800	< 100
BOD5, PPM	8000-9000	1500	< 210

Contact CASTion

The detergent and fabric softener producer now operates more efficiently and cost effectively with CASTion. Contact CASTion today to learn how we can help your company achieve its waste disposal goals.