

Process Improvements Reap Large Rewards



US Pack in Leominster, MA, is one of the few custom formulation blending and packaging facilities in New England, specializing in a wide range of custom liquid specialty products, primarily for applications in the automotive aftermarket sector, as well as for household and industrial markets.

US Pack is committed to reducing chemical use and toxic chemical waste and improving efficiencies with new equipment and process improvements. The company received a grant from TURI in 2017 to expand its product capabilities and operations while reducing or eliminating waste for key product categories.

The grant provided for acquisition of a new, more efficient filling line, including a 10-head pressure gravity filler with dedicated air-actuated diaphragm pumps. The new system permits more precise production batches and an easier system cleanout between batches. Its greater efficiency increases production time, reduces solvent use and waste from changeovers. The system allows US Pack to use more water-based products as well as increasing throughput. Based on these changes, the use of acetone, ethylene glycol and methanol are predicted to be reduced by as much as 19,000 pounds total each year.



The US Pack filling system

Before installing the new equipment, the average excess blend quantity was 10-12%. With the new equipment, this number has dropped to 2% on average for all blends. Cleanup on the old fill lines required 1 to 15 gallons of waste/flushed product, depending on the chemical. The new fill lines reduce that number to 0-3 gallons.

The new equipment helped the facility move toward its goals of:

- Reducing toxic chemical use
- Improving worker health and safety
- Increasing process efficiency and yield
- Reducing waste generation and water use

Financial Performance

The TURI grant provided \$20,000 in funding to help purchase the equipment; however, the project was financially feasible on its own.

Cost and Return Analysis: New 10-Head Gravity Filler

One-time Costs	Capital Equipment	\$46,825
	Installation	\$2,160
	Training	\$3,200
	Misc. Installation Materials	\$800
Total One-time Costs		\$52,985
Annual Savings	Line Changeover Labor Savings	\$26,000
	Line Efficiency Revenue Increase	\$130,000
Total Annual Savings		\$156,000

In addition to this work, US Pack has been diligently implementing lean manufacturing techniques to further reduce the waste associated with this kind of manufacturing. Starting with hazardous waste reduction in 2011, US Pack has implemented projects such as:

- Production scheduling to reduce equipment cleanup wastes
- Product blending waste reduction
- Single stream packaging recycling
- Fiberboard reuse



Close-up of the 10 head filling system

US Pack is committed to being an environmentally responsible company. The facility recycles approximately 60% of manufacturing solid waste and its plant is powered by solar.

US Pack is continuously looking for projects to not just save money, but to reduce its environmental footprint.