

INCORPORATING WET-CLEANING TECHNOLOGY AT A DRY-CLEANING COMPANY

Case Study | Fox Cleaners | Tulsa, OK | EPA Region 6 | Facility Type: Dry-cleaning and Laundry Services | NAICS Code 8123

INTRODUCTION

Oklahoma's Department of Environmental Quality (DEQ) set out to work with dry-cleaning companies in the state to reduce the usage of perchloroethylene (PERC). Replacing PERC with safer substitutes prevents adverse environmental impacts, prevents the risk of worker exposure, and alleviates the regulatory burden that comes along with using PERC.

DEQ sent letters to dry cleaners permitted for use of PERC and petroleum solvents to solicit volunteers to participate in Pollution Prevention (P2) technical assistance. Of the twenty-eight letters DEQ sent, Fox Cleaners was the only respondent to the solicitation.



“Life is better when it’s clean and green.” – Maggie Fox, Owner

WHY THE FACILITY CHOSE TO PARTICIPATE IN THE P2 PROGRAM

Fox Cleaners (Fox) in Tulsa, Oklahoma, responded with eagerness to the solicitation letter. They had already begun adopting sustainable practices into the company after Maggie Fox lost her husband, and founder of Fox Cleaners, to cancer in 2007, which Maggie partially attributes to his prolonged exposure to PERC, a known carcinogen.

Since then, Fox has established the following sustainable practices:

- Replaced PERC with hydrocarbon solvents.
- Upgraded to energy-efficient equipment to reduce energy and water usage.
 - Insulated steam pipes to minimize heat loss.
 - Installed tensioning equipment.
 - Installed a *Progetti Guilietta* assembly and automatic bagging system, which helps to limit the use of plastic for covering dry-cleaned items.
- Replaced delivery fleet with high-efficiency vehicles.
- Performs regular maintenance on equipment and fleet vehicles to ensure safety and maintain equipment efficiency.
- Launched a hanger recycling program to encourage customers to return and recycle hangers.
- Provide reusable bags for pick-up and delivery, eliminating the need for single-use poly bags.
- Installed an onsite water bottle filling station.
- Recycles cardboard, office paper, aluminum, and plastic.
- Became a member of the Green Business Benchmark and America's Best Cleaners.

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Additionally, Fox understands that to have the most efficient and sustainable business, they need their customers to participate. To educate their customers and the public, they proudly advertise their Green Business Bureau and America's Best Cleaners memberships on their storefront windows and website. They encourage and incentivize their customers to participate in their sustainability initiatives through programs like their hanger take-back program, which gives the customer a discount for returning metal hangers for re-use. And through their offer of reusable garment bags.



FACILITY DETAILS

Size: 4,000 square feet
Annual revenues: \$1,425,000.00
Number of employees: 17

PROBLEM IDENTIFIED THROUGH P2 TECHNICAL ASSISTANCE

Although Fox had already transitioned away from PERC, they were still using hydrocarbon for dry cleaning. While safer than PERC, hydrocarbons still contain similar hazardous properties with effects of similar concern, such as being carcinogenic, a respiratory and skin

irritant, neurotoxicity, environmentally persistent, flammable & volatile. Fox was highly motivated to continue advancing their sustainability practices and identified the wet-cleaning machine technology as a substitution for their hydrocarbon dry-cleaning machine. The transition allowed them not only to move away from harsher chemicals, but to save on water and energy usage.

MAJOR INNOVATIVE P2 ACTIONS IMPLEMENTED AT THE FACILITY

Fox Cleaners purchased the *Poseidon Textile Wetcleaning Care System* including the *Poseidon E060# washer with Intelli control* and the *ED60 85# gas moisture control dryer*. It was installed at their facility in April of 2024. The new wet-cleaning system offers conditional programmability for most fabric types and is environmentally safe and non-toxic. The dryer saves energy through heat optimization and programmability.



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RESULTS

Projected annual reductions for the wet-cleaning equipment are:

\$	
One-time Cost to Implement	Annual Savings from P2 Action
\$30,000	\$2,400 (cost of hydrocarbon solvent)
Annual Reductions	
Hazardous Material Input (gal.)	
30	
Air Emissions (lbs.)	Water Pollution (lbs.)
90	155
MTCO ₂ e Emissions (metric tons)	Water Use (gal.)
29.9	432,000

When transitioning from a dry-cleaning machine to a wet-cleaning machine, Fox Cleaners had no major difficulties and saw much better outcomes overall. While the new machine required learning new techniques for handling, drying, and finishing garments, seeking guidance from their vendor proved to be an invaluable resource. Fox learned to balance the new detergent types and water temperatures for different fabrics, as well as overcoming the fear of damaging items that were previously considered dry-clean only.

The new wet-cleaning machine has significantly reduced the use of toxic chemicals, minimizing adverse effects to employees, and mitigating environmental health impacts. The new machine is effective on a wide range of fabrics and reportedly performs even better than PERC and hydrocarbons when cleaning garments.

Specifically, stains are more effectively removed, and the clothes smell better and feel softer.

Overall, there are multiple environmental and human health benefits of the new equipment:

- Uses significantly less water – saves up to 3 gallons of water with each fill.
- Lower water-heating costs.
- Reduced chemical usage, which reduces the risk to the employees for chemical contact, as well as contact with the environment.
- Shorter dry times which lead to less energy usage.

Fox will continue to gather reductions data, and work with DEQ to develop best practices for other dry-cleaning companies, for both the wet-cleaning technology, as well as for general source reduction and sustainability initiatives.

FINANCING MECHANISM USED TO IMPLEMENT THE P2 PRACTICE

DEQ funded Fox with a reimbursement grant to purchase the equipment. Fox purchased the equipment, paid for it, and then submitted the invoice to DEQ for reimbursement. The reimbursement funds were paid from DEQ's P2 grant.