

Additional Savings and Benefits

In addition to financial savings, there are non-tangible benefits associated with a conversion to wet cleaning.

Eliminate risk of cleanup costs

Eliminating the potential for contamination is a major benefit to using wet cleaning. Total cleanup costs for dry cleaning sites where a release of perc has occurred can range from \$75,000 to over \$2,000,000, with the average cost at around \$250,000.

Reduce potential environmental liability

If a spill or release occurs, the potential migration of contaminants to groundwater can become a serious public health concern if groundwater is the primary source for drinking water. Natural resources located near a dry cleaner release can potentially be damaged if contaminated groundwater continues to migrate away from a site.

Protect public health

At contaminated sites where the water table is relatively high, there may be a greater potential for volatile organic compounds, such as perchloroethylene, to volatilize from the water table and migrate upwards through a building foundation and enter the work or residential breathing zone.

Please customers and workers

Ace Cleaners owners and employees are happy with the new technology and the significantly improved air quality in the facility. The smell of solvent in the air is now eliminated. The cleaner notes that customers are happy with the conversion to wet cleaning, as more and more consumers are looking for environmentally-friendly services. He has posted signs saying that he is an environmentally-friendly cleaner.

Conclusions

During their first year of operation as a wet cleaner, the facility saved \$1,844 and reduced their electricity use by 15% compared with what it would have cost them to go to a new perc machine.

With more time, it is hoped that annual savings will continue to increase. In addition, the time savings this cleaner experienced with wet cleaning translates to a potential increase in throughput the facility could achieve, leading to increased potential revenue. It is important to note that in addition to the realized and potential savings and revenue, the very real benefit of improved air quality in their work environment plus increased customer demand for environmentally-friendly cleaning help make the case for wet cleaning as a preferred alternative technology to solvent cleaning.

About the Toxics Use Reduction Institute

The Toxics Use Reduction Institute (TURI) at the University of Massachusetts Lowell provides the resources and tools to help Massachusetts businesses and communities make the Commonwealth a safer place to live and work. Established by the state's Toxics Use Reduction Act of 1989, TURI provides research, training, technical support, laboratory services and grant programs to reduce the use of toxic chemicals while enhancing the economic competitiveness of local businesses. Learn more at www.turi.org.



Summary of all Costs/Savings

Item	Annual Costs	Annual Savings
Equipment		\$544
Performance	\$360	
Operations		\$2,009
Resource Use		
• Electricity		\$467
• Natural Gas	\$0	\$0
• Water	\$378	
• Sewer	\$441	
Total Cost/Savings in 12 months	\$1,179	\$3,020
Total Savings	\$1,841 per year	

Eliminating the Use of Toxic Chemicals in Dry Cleaning

A Feasibility and Cost Comparison of Perchloroethylene Dry Cleaning to Professional Wet Cleaning



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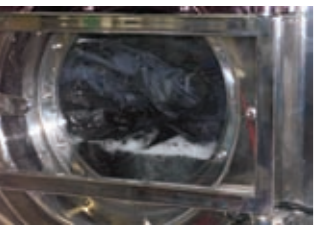


Dedicated Wet Cleaning Shows Conservation of Resources and Overall Cost Savings

Overview

Professional wet cleaning has been identified as one of the most promising alternatives to perchloroethylene in the dry cleaning industry. The Toxics Use Reduction Institute at UMass Lowell provided a matching grant to Ace Cleaners in North Andover, Massachusetts, to help the small business convert its operations from perchloroethylene-based to water-based processes.

The analysis of two years of data is presented here, including capital costs, performance data and associated costs, operational costs, and resource use and associated costs. The bottom line? During their first year of operation as a wet cleaner, **Ace Cleaners realized \$1,844 of savings and a 15% reduction in electricity use.**



With a TURI \$17,000 matching grant, Ace Cleaners purchased a new washer, dryer, and two pieces of tensioning equipment. The 2,300 square foot facility was fully operational as a dedicated wet cleaning facility by November of 2010.

The facility, owned by Angela and Yong Kim, operates with the same number of employees (four full-time-equivalents) as when it was a perc-shop, though one part-time person was hired to assist with shirt pressing. The facility cleans

an average of 150 items per day using laundry equipment and about 120 items per day using professional wet cleaning equipment. While these numbers are slightly less than what the cleaner processed previously, it is likely that the drop can be attributed to the general economic slowdown rather than equipment inefficiency or customer dissatisfaction. The owners have noted that additional customers have sought them out due to their wet cleaning services.

Performance

The cleaner has made the commitment to work towards cleaning 100% of incoming garments on-site in the wet cleaning equipment. Currently, approximately 25 items are sent out each month, at an expense to the cleaners of about \$30. It is anticipated that this number of send-outs will drop as the cleaner becomes more comfortable with cleaning wools in water, as other professional wet cleaners have done.

Both as a perc facility and as a wet cleaning facility, the cleaner processed an average of four re-dos per month. Because this number was the same whether the shop operated as a perc or wet cleaning shop, there are no cost savings associated with this activity.

This cleaner had no damaged-item claims during the two 12-month periods when data was collected as a perc facility and as a wet cleaning facility.



Capital Costs

- HwaSung equipment – \$31,300 (includes \$13,000 for a washer, \$5,000 for a dryer, \$7,000 for a unity press, and \$6,300 for a pants toppler).

Compared to purchasing a perc machine, the cleaner realized an annual cost savings of approximately \$544.

“Before this change, when I would open the door to work there was a strong smell, and because I have asthma, I would cough and choke,” said Yong Kim. “Now when I get to work, everything smells clean and fresh. Not only does the technology do a great job of cleaning the clothes, it is better for the health of my customers and workers.”

Operational Costs

Data show that converting to wet cleaning yields an overall savings in labor time.

Labor Time

Time Investments	Perc Facility	Wet Cleaning Facility
Load Size (pounds)	50	50
Cycle Time (minutes/load)	45	20
Regulatory Paperwork (hours/year)	2	0
Spotting Time (average minutes/day)	45	20
Finishing Time (average hours/day)	6	5
Training (hours/employee)	6	2

Resource Use

- Electricity is provided by National Grid to power the washers, dryers, operation of computers, sensor systems, detergent pumps and tensioning equipment. The amount of electricity used to power the facility declined after the conversion to wet cleaning by about 15%.
- Natural gas is used at the facility to provide steam and hot water for equipment and other facility uses. As a perc facility and as a wet cleaning facility, the natural gas use remained fairly consistent.
- Water is used at the facility in the equipment as well as for the general sanitary uses. The amount of water used increased at the facility once wet cleaning equipment was installed. This water use increase is not typical of professional wet cleaning systems and can be attributed to the specific equipment used at this facility.

Note: In Massachusetts, laundry and dry cleaning shops are not allowed to discharge waste water to a septic system without a groundwater discharge permit from the Department of Environmental Protection.

Summary of Resource Use

Item	Use/month As perc facility	Use/month As wet cleaning facility	Percentage Change	Costs/year
Electricity use (kWh)	1,945	1,659	-15%	\$467
Natural Gas for Boiler (therms)	630	631	0%	0
Water Use (100cuft)	20	25	+27%	\$378
Sewer Discharge (100cuft)	20	25	+27%	\$441
Total Costs				\$352

The use of wet cleaning has decreased operating costs in the first 12 months by an average of \$168/month.

Summary of Operating Expenses

Item	Costs/month As perc facility	Costs/month As wet cleaning facility	Savings/year
Maintenance	\$140	\$32	\$1,301
Filters	--	--	--
Solvent	\$91	\$0	\$1,092
Detergent	\$110	\$217	-\$1,284
Spotting Agents	\$17	\$0	\$200
Hazardous Waste Disposal	\$38	\$0	\$450
Regulatory fees	\$21	\$0	\$250
Total Savings			\$2,009

