



P2 Bulletin

the newsletter of the New York State Pollution Prevention Institute (NYSP21)

Special Edition!

A P2 Bulletin Special Edition: NYS Professional Wet Cleaning Program

With funding from the New York State Department of Environmental Conservation and the Environmental Protection Agency, the New York State Pollution Prevention Institute is addressing the use of perchloroethylene (perc) in dry cleaning by promoting professional wet cleaning, an economically and environmentally preferable alternative.



New York State Pollution Prevention Institute
Wet Cleaning Program

Why dry cleaning?

New York has the second highest number of garment cleaning facilities in the country¹. Of the almost 2,000 cleaners in the state, 80% use perc and emit over 130 tons of perc² to the atmosphere every year. Perc has many potential health effects. Residents living near dry cleaning shops are exposed to low levels of perc which may lead to reduced scores on tests of visual perception, reaction time, and attention³. Long term exposure to higher levels, such as those experienced by dry cleaning workers, can affect the liver, brain,

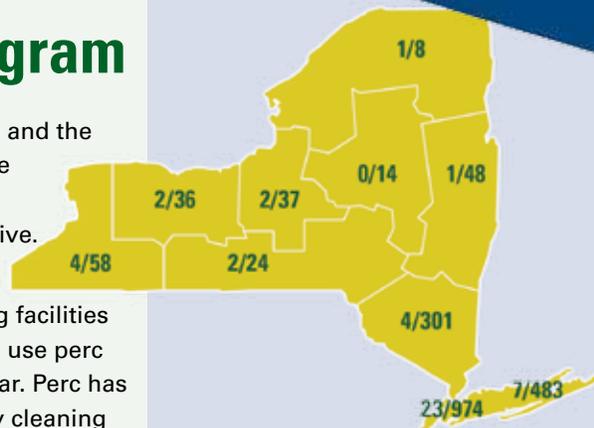
and kidneys. Perc is a carcinogen, persists in the environment⁴, and does not easily or quickly break down into less toxic byproducts.

Why wet cleaning?

Wet cleaning uses water, biodegradable detergents, and sophisticated equipment to clean garments typically dry cleaned. It's the least costly cleaning method and the human health and environmental hazards associated with perc dry cleaning are virtually eliminated.



Professional wet cleaning washer, drier and finishers.



of Wet Cleaners/Total # of Cleaners

Source: NYSP21's NYS dry cleaner database adapted from NYSEFC's dry cleaner database, March 2012)

Wet Cleaning Advantages

A wet cleaning system is made up of sophisticated equipment, including **washing machines that simulate handwashing and driers that don't overdry**. Tensioning finishers ensure jackets, pants, and other structured garments are properly **finished without shrinking**.

Wet cleaning cleans better than perc.

It has been shown to produce whiter whites, is easier to remove water based stains, and performs better than perc for some items such as heavily soiled garments.

Wet cleaning significantly **reduces or eliminates human health and environmental concerns and their liability** often seen with perc and other alternatives.

Wet cleaners can market their business as **green or environmentally friendly**.

Wet cleaning is the least costly dry cleaning method. Dry cleaners are **saving money by converting to wet cleaning!**

¹According to the 2007 US Economic Census, NAICS 8123202 "Dry Cleaning Plants", California has the most plants (2,824) and New York is second, with 1,960 plants.

²The average perc machine loses about 4 fluid ounces (0.42lbs) of perc to the atmosphere every day; Drycleaning & Laundry Institute, A DLI White paper: Key Information on Industry Solvents, July 2007.

³NYSDOH, Fact Sheet: Tetrachloroethylene (perc) in Indoor and Outdoor Air, May 2003, http://www.health.state.ny.us/environmental/chemicals/tetrachloroethene/docs/fs_perc.pdf.

⁴PBT Profiler, <http://www.pbtprofiler.net/>.

Professional Wet Cleaning Conversion & Demonstration Programs

Rainbow Cleaners of Manhattan and All Fabric Cleaners of Farmingville have been selected to participate in NYSP2I's Professional Wet Cleaning Conversion Program. With funds from NYSDEC and an EPA Region 2 Source Reduction Assistance grant, the cleaners installed professional wet cleaning equipment onsite and will host two demonstrations of wet cleaning for other cleaners. NYSP2I will collect metrics on their perc and wet cleaning operations to develop case studies for both cleaners.

In addition to the four demonstrations held by Rainbow Cleaners and All Fabric Cleaners, an additional four demonstrations at pre-existing wet cleaners will be held. The purpose of the demonstrations is to educate cleaners about the benefits of professional wet cleaning and connect cleaners with experts to get their technical questions answered. The first wet cleaning demonstration was held December 12, 2011 at Express Cleaners II in Queens and a second demonstration is scheduled for April 24 at All Fabric Cleaners. The remaining six will be held in fall 2012 and spring 2013.

Silver Hanger Cleaners in Bellingham Massachusetts converted their operations from perc to 100% professional wet cleaning in 2008. Data was collected for one year operating with perc and one year operating with wet cleaning.

The cleaner saves \$2,700 a year with wet cleaning through decreases in electricity, water, natural gas, maintenance costs, hazardous waste disposal and regulatory fees, equipment costs, and claim costs.



Rainbow Cleaners Install Professional Wet Cleaning System

Danny Yoo, owner of Rainbow Cleaners, 36 West 15th Street, Manhattan, recognizes the environmental burden of using perc and is concerned about the potential public health risks as his store is located on the first floor of a twelve story residential building. His landlord and building residents share these health concerns.

Rainbow Cleaners purchased and installed their wet cleaning equipment in March 2012. Danny expects to immediately offset 90% of his current dry cleaning with the wet cleaning system. He hopes to achieve 100% and eliminate perc dry cleaning at his shop within one year. NYSP2I and Rainbow Cleaners will cohost two demonstrations to showcase the wet cleaning technology to other dry cleaners.

“I am very excited to be using wet cleaning. The building residents, my customers, and employees all benefit from this safer technology.”

— Danny Yoo, Owner, Rainbow Cleaners, Manhattan

All Fabric Cleaners Converts to 100% Professional Wet Cleaning

All Fabric Cleaners, 2316 North Ocean Avenue, Farmingville, Suffolk County, is located in a strip mall and poses potential health risks to adjacent businesses. Yong Choi, the owner, chose to install wet cleaning to reduce the environmental burden of his shop and eliminate the health risks associated with dry cleaning. As a bonus, All Fabric Cleaners can market themselves as an environmentally friendly business.

“When I heard about the NYS program, I was already interested in wet cleaning. P2I put me in contact with successful wet cleaners in California who answered my questions and I attended the CleanShow in Las Vegas to learn more about wet cleaning. After hearing story after story of successful cleaners, I knew I was making the right choice.”
 — Yong Choi, Owner, All Fabric Cleaners, Farmingville

In September 2011, All Fabric Cleaners installed a wet cleaning washer, dryer, top tensioner, and bottom tensioner. At the time of the installation, Yong planned to transition all of his dry cleaning to wet cleaning in one year. Wet cleaning has performed above and beyond Yong’s expectations and he discontinued the use of his perc machine in December 2011, a full nine months earlier than anticipated.

“I am beyond happy with the performance of wet cleaning. I am able to wet clean all garments that I was dry cleaning before. With wet cleaning, the clothes come out cleaner, we don’t pay to get rid of perc, and my employees are happy because our shop is healthier,” said Yong.

All Fabric Cleaners is one of a handful of 100% dedicated professional wet cleaners in New York State. All Fabric Cleaners will hold demonstrations of their wet cleaning system on April 24, 2012. For more information, see page six.

Preliminary Metrics	Estimated Annual Cost Savings	Estimated Annual Savings
Performance		36% increase in efficiency 98% reduction in sendouts, redos, and claims
Electricity usage	\$3,820	43% reduction
Natural gas usage	\$1,030	11% reduction
Detergent & spotter usage	-\$1,830	290 gallons
Perchloroethylene	\$2,820	166 gallons
Filters and equipment maintenance	\$3,920	
Hazardous waste disposal	\$780	730 pounds
Air pollution		950 pounds
NYSDEC permit	\$160	
Total	\$10,700	

Metrics compare Jan, Nov, Dec 2010 operating data with 11/11–1/12 operating data. Data are normalized to 2010 pounds of garments cleaned.



Yong Choi, owner of All Fabric Cleaners, stands proudly next to his new wet cleaning system.

“We were a very ordinary dry cleaner who used perc for the last 15 years. If we can successfully convert to wet cleaning, we believe every dry cleaner can do wet cleaning.”
 — Yong Choi, Owner, All Fabric Cleaners, Farmingville

Wet Cleaning Demonstration Held at Express Cleaners II in Queens

A wet cleaning demonstration was held December 12, 2011 at Express Cleaners II, located at 135-11 Lefferts Boulevard, South Ozone Park, in Queens. Express Cleaners II began as a drop shop, with no onsite cleaning. Five years ago a wet cleaning system was purchased to clean garments on site. The owners, Raymond and Sheri Rooplal, chose wet cleaning because they were aware of the environmental impacts of perc and other dry cleaning solvents that don't exist with wet cleaning.

The demonstration attracted nearly a dozen participants, with the majority from cleaners interested in adding wet cleaning to their shop or replacing their current system with wet cleaning. At the demonstration, attendees saw the wet cleaning process from start to finish and participants spoke directly with current wet



(l to r) Kate Winnebeck, NYSP2I; Ray, Sheri, Raymond, and Vicky, Express Cleaners II

cleaners and NYSP2I technical staff. NYSP2I provided information on the financial, environmental, and quality benefits of wet cleaning, as well as potential sources of funding to assist in the decision making process. The demonstration increased awareness of wet cleaning, piqued the interest of attendees, and illustrated that wet cleaning can be very successful.



Did you know...

Careful of Green Washing

Use of the term 'organic' is not regulated by the dry cleaning industry, nor are the terms "environmentally friendly", "green", "non-toxic", "environmentally preferable" or others that refer to the environmental footprint of cleaners.

Using the chemical definition of organic, both perc and hydrocarbons are classified as organic as they contain a carbon molecule. Long story short: when selecting a dry cleaner, **be sure to ask what cleaning solvent is used to wash your garments.**

Dry Cleaning Solvents

Perchloroethylene (perc): traditional dry cleaning solvent with a number of known health effects; also used in other industry sectors including degreasing operations, paints and coatings, and industrial and consumer products

Glycol ether (Rynex®, Solvair®): biodegradable volatile organic solvent with low volatility and a high flash point

Liquid carbon dioxide: non-flammable, naturally-occurring gas that becomes a liquid solvent when pressurized; no expected health risk to the general public from these processes; CO₂ is obtained from large combustion sources, so there is no net increase in greenhouse gas emissions due to this process

Siloxane D5 (GreenEarth®): silicone based solvent; non flammable; potential health effects are somewhat controversial

Hydrocarbon (DF-2000™, Ecosolv®): volatile organic solvent that contributes to the formation of ozone which is linked to ill-health effects including respiratory irritation and asthma; flammable

Mineral spirits or Stoddard solvent: highly flammable organic solvent typically used in painting

Water & biodegradable detergents: Professional wet cleaning uses water and sophisticated equipment to clean clothes that would normally be dry cleaned; no known health or environmental concerns with use

What are the other alternatives?

Alternative solvents clean garments in a manner similar to perc. The garments are submerged in the solvent, detergents and sizers may be added, garments are spun to remove any residual solvent, dried, and pressed to finish them. Many of the alternatives have proved viable, although many have their own concerns. See the *Dry Cleaning Solvents* for more information.

Is professional wet cleaning safe for garments? Is it safe for the environment?

Wet cleaning has proven successful for many types of 'dry clean only' garments. Professional wet cleaning has been shown to produce whiter whites, is easier to remove water based stains, and performs better than perc for some items such as heavily soiled garments. In addition, professional wet cleaning significantly reduces, and in some cases eliminates, the human health and environmental concerns often seen with other alternatives.

Professional Wet Cleaning is not the same as washing at home

The main difference between a wet cleaning system and your home washing machine is the level of sensitivity and precision of the wet cleaning system. Your washer at home may have a half dozen or so modes for cleaning different garment types. A wet cleaning machine may have 20+ cleaning modes, so your garments are cleaned at exactly the correct temperature, minimally agitated, and the perfect mix of detergents are used to prevent shrinking and color loss. Garments are dried perfectly and sophisticated tensioning equipment is used to press them.

P2 Bulletin Special Edition!

April 2012

A publication of the

New York State Pollution Prevention Institute
111 Lomb Memorial Dr. • Rochester, NY 14623
585.475.2512 • www.nysp2i.rit.edu

Executive Editor: Dr. Anahita Williamson, Director

Managing Editor: Erica Hernandez

Writer: Kate Winnebeck

Editor: James Sutherland

Graphic Design: Laura W. Nelson

Upcoming Professional Wet Cleaning (PWC) Demonstrations

ALL FABRIC CLEANERS, 2316 NORTH OCEAN AVENUE, FARMINGVILLE, NY

April 24, 2012 • 10:30am

This demo is for government, community, and other stakeholders interested in learning more about the benefits of PWC. Contact Kate at 585.475.5390 or kate.winnebeck@rit.edu by April 20 to attend.

April 24, 2012 • 2:00pm

This demo is for cleaners interested in seeing a wet cleaning system in action and hearing from a cleaner that successfully converted from perc to PWC! Contact Ben at 585.475.6869 or bemp2i@rit.edu by April 20 to attend.



NYSP2I is seeking professional wet cleaners in NYS interested in hosting a demonstration at their shop.

Financial incentives are available and schedules are flexible.

For more information, contact Kate at 585.475.5390 or kate.winnebeck@rit.edu



Contact us for more information about the NYSP2I professional wet cleaning program

Kate Winnebeck, wet cleaning program manager ♦ 585.475.5390 ♦ kate.winnebeck@rit.edu
www.rit.edu/nysp2i/garment-cleaning



New York State Pollution Prevention Institute

Rochester Institute of Technology
111 Lomb Memorial Drive
Rochester, NY 14623-0426
585.475.2512, phone ♦ 585.475.6610
nysp2i@rit.edu ♦ www.nysp2i.rit.edu

Funding provided by NYS Department of Environmental Conservation