



Energy Efficiency & Customer Research & Development Technology Brief...Professional Wet Cleaning

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Background

When you heard the words “dry clean” what comes to your mind? Chances are good you will think about that familiar “dry cleaner” smell. That odor is from a solvent known as perchloroethylene (PCE). In fact, the term dry clean means that solvents are used in lieu of water to wash the clothes. For the past fifty years, most professional dry cleaners have used PCE, but that is about to change – at least in California.

Although PCE does a good job cleaning garments, it has been classified as a “probable human carcinogen” and there are some serious health risks for chronic prolonged exposure¹. In January of 2007, the California Air Resources Board issued a mandate phasing out the use of PCE in dry cleaning machines². Under this ruling, professional cleaners who wish to continue to do business in California must ultimately switch over to alternative methods. For details, please visit the California Air Resources Board website at <http://www.arb.ca.gov/html/flslist.htm>

There are presently four alternatives to PCE available:

1. Petroleum dry-cleaning
2. Silicone dry cleaning
3. Professional wet-cleaning
4. CO₂ dry cleaning

To gain a better understanding of professional wet cleaning, SMUD hired Peter Sinsheimer, Director of the Pollution Prevention Center Urban and Environmental Policy Institute at Occidental College, to help two local cleaners test professional wet-cleaning. The project began in 2007 and was completed in June of 2009. The purpose of this Technology Brief is to present highlights of the project. The complete report is available via SMUD’s Customer Advanced Technologies program website: www.smud.org/en/education-safety/Pages/cat.aspx

¹ Tetrachloroethylene (Group 2A) - Summary of Data Reported and Evaluation, IARC Monograph 63; International Agency for Research on Cancer, 1995.

² CARB, Perchloroethylene Dry Cleaning ATCM, December 27, 2007.

Technology Overview

Professional wet cleaning is a water-based process that uses computer-controlled washers and dryers, specially designed biodegradable detergents to clean sensitive and delicate garments, and specialized tensioning finishing equipment to restore shape and form. Both equipment and operating costs are lower in wet cleaning compared to PCE dry cleaning, and cleaners who have switched to professional wet cleaning have been able to process the full range garments they had previously dry cleaned. Professional wet cleaning offers the following advantages:

- ✓ Uses non-toxic, environmentally friendly detergents
- ✓ More energy efficient than PCE equipment and other options (see Figure 1 below)
- ✓ Uses much less water than other options

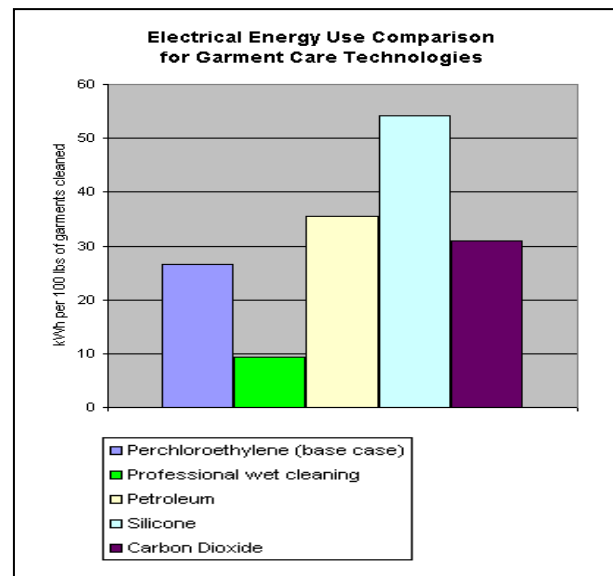


Figure 1: comparison of garment care technologies. Professional wet cleaning is clearly the most energy efficient option currently available. Source: Southern California Edison / Sempra Energy ET 05.01 Final Report

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Why does professional wet-cleaning use less energy? Solvent based systems (PCE, petroleum and silicon) require energy-intensive pollution control devices. These devices are used to recover and clean the solvents and include refrigeration systems, pumps and cooling towers. Liquid CO² systems use more energy because they operate at higher pressures and require vacuum pumps, compressors and cooling towers.

Professional wet cleaning is more energy efficient, but what about water consumption? Surprisingly professional wet-cleaning uses the same or less water than PCE. One of the main reasons is elimination of the cooling tower. Sub-metering at one of the test sites in Sacramento revealed that the PCE system consumed 1,063 gallons per 100 lbs of garments cleaned versus 308 gallons per 100 lbs. of garments cleaned by wet cleaning – a reduction of seventy-one percent!

Market Barriers

Professional wet cleaning is more energy efficient, and the cost of the equipment is comparable to PCE. However, professional wet cleaning faces several significant market barriers including:

- ✓ Lack of awareness within the dry cleaning industry. Wider market acceptance will require a significant amount of training and outreach.
- ✓ Industry equipment distribution channels tend to favor petroleum and silicon systems. Since these systems are more expensive than professional wet cleaning, they may provide higher profit margins.
- ✓ Grease removal and tensioning are more labor intensive than solvent-based systems.
- ✓ Some cleaners fear using professional wet cleaning garments that are labeled “dry clean only.” They believe that using any other method is against the law (it’s not). Some discussions have been held with the Federal Trade Commission (FTC) to develop a “professional wet cleaning” label, but until more cleaners adopt this technology, the FTC is reluctant to act upon this request.
- ✓ Commercial garment care equipment is expensive. Depending on the type and capacity of system, they range from \$50,000 to \$200,000. That is a lot of cash for a small business owner. Cleaners will most likely need access to low cost financing to help fund system replacements.

Customer Spotlight

Country Club Cleaners is located at 2612 Watt Avenue in Sacramento and is owned and operated by Sarah and Paul Lee. Mrs. Lee thought it was going to be “somewhat difficult” to transition to professional wet cleaning. Her main concerns were quality of cleaning– to make sure the wet cleaning process worked and that there would be no shrinkage of garment and no harm to silk garments. Now that she is actively doing wet cleaning, Mrs. Lee says that adapting to wet cleaning was “not too difficult.” She says shrinkage ended up not being a problem at all. The biggest problem she found had to do with removing grease from garments. She believes degreasing is still a problem and that the wet cleaning equipment companies need to work on that. Overall, Mrs. Lee is extremely happy that she opted for wet cleaning and says she would make the same decision again if she had to. She says the clothes come out cleaner and she doesn’t have to worry about exposing her customers to chemicals. She loves the fact the process is “environmentally safe.”



Arden Plaza Cleaners is located at 4373 Arden Way in Sacramento and is operated by Ms. Kim Chan. When she first heard about wet cleaning, she was skeptical. However she was curious so she sent her operator to a wet cleaning workshop at Country Club Cleaners. Her operator was so impressed, he told Ms. Chan she had to see wet cleaning in action. Consequently, Ms. Chan spent a day at Country Club Cleaners to observe wet cleaning. She was so impressed by the quality of wet cleaning and the easiness of the process that she decided to switch over to wet cleaning. Ms. Chan reports that her business has tripled since December 2008. She believes the increase is due to the fact that a neighboring cleaner recently went out of business, and also, word is traveling around her area that she is doing “chemical-free” cleaning.



Next Steps

SMUD is currently developing a rebate program for professional wet cleaning. For more information, please call SMUD at 1-877-622-7683.

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