



# How to Care for the Planet and Your Health While Also Caring for Your Clothes

Conventional dry cleaning is risky to public health and the environment. Consumers should minimize traditional dry cleaning services and wash more clothes at home in cold water. Designers can help by minimizing the reliance on fabrics that need to be dry-cleaned by educating their customers about cleaning alternatives.



## THE ENVIRONMENTAL PROBLEMS OF DRY CLEANING

On the surface, dry cleaning seems like a harmless and almost miraculous process. For consumers, the dry cleaner whisks away their beloved, and seemingly difficult to clean, one-of-a-kind pieces and delicate garments, and returns them perfectly pressed and in like-new condition. Even fashion houses rely heavily on the service for sample maintenance. When the cleaning process is scrutinized, however, it is found to pose risk to human health and our environment.

The conventional dry cleaning industry uses a chemical called perchloroethylene—or “PERC”—to clean clothes. Known to cause a number of adverse health effects, high-level exposure to PERC can affect the central nervous system, kidney, and liver, and cause mood and behavioral changes, impairment of coordination, dizziness, headache, and fatigue. Chronic exposure to lower levels of the chemical can lead to cognitive and motor functioning impairment, headaches, vision impairment, and in more isolated cases, cardiac arrhythmia, liver damage, and kidney effects.<sup>1</sup> PERC has also been demonstrated to have reproductive or developmental effects, and may cause several types of cancer.<sup>2</sup>


Conventional dry cleaners are responsible for the majority (60 percent) of the total use of PERC in the United States.<sup>3</sup> Through routine use of the dangerous chemical, dry-cleaners become a major source of toxic air pollution and hazardous waste in many neighborhoods and communities.<sup>4</sup>

In fact, three-quarters of PERC dry cleaners in the United States are estimated to have contaminated soil and groundwater where they are located.<sup>5</sup> Off-site disposal of hazardous waste by cleaners has resulted in PERC becoming a common contaminant at more than half of our nation’s Superfund hazardous waste sites.<sup>6</sup> For these reasons, it is important to reduce and eventually eliminate this chemical from routine use.

Customers who regularly dry clean clothes can affect their own indoor air quality by bringing a trace of toxic PERC residue into their homes where it can linger in the air, even when the clothes are not being worn. In its investigation, the Colorado Department of Public Health and the Environment found PERC in the indoor air of many homes. The Federal Agency for Toxic Substances and Disease Registry found that in homes and cars containing fresh dry cleaning, PERC concentrations sometimes rise above levels of concern.<sup>7</sup>

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## M&S—Leading By Example with ‘Think Climate’ Message On Care Tags



M&S, first retailer to offer machine-washable wool knitwear in the late 1960s, and has long made clothes easy to care for as well as great to wear. In 1988 they introduced wool knits that consumers could wash and tumble dry instead of dry clean. They were also the first to offer machine-washable

cashmere and suede, and have developed selected ranges of luxury fabrics, such as silk, that can be both machine washed and tumble dried.

The latest M&S eco-fashion feat is an initiative to inform their consumers about garment care options. Starting in 2007, M&S pledged to print “Think Climate—Wash at 30 degrees Celsius” on all garments that could safely be washed at this temperature. Today approximately 70 percent of machine-washable clothes from M&S carry this label. M&S notes that although some of its customers expressed worry that a 30°C wash would not clean as effectively as a 40°C, independent tests show there is no significant reduction in performance for everyday loads.<sup>23</sup>

The levels of PERC exposure in the dry-cleaning facility are also of concern. Workers handling PERC have been found to be at an increased risk of esophagus and bladder cancer, non-Hodgkin’s lymphoma, spontaneous abortion, menstrual and sperm disorders, and reduced fertility.<sup>8</sup>

For all of these reasons, in 2007 California took a bold step of phasing out PERC dry cleaning. The law prohibits the installation of new PERC dry cleaning machines, and retires the use of older machines after 15 years of service, with all PERC machines in the state required to be taken out of service by 2023. As a result, the number of PERC dry cleaning machines in California has dropped by half.<sup>9</sup> Illinois is not far behind, having recently introduced legislation also targeting the use of PERC in the dry cleaning industry.<sup>10</sup> Massachusetts and New Jersey provide incentives for conversion from dry to wet-cleaning machines.<sup>11</sup>

## ALTERNATIVES TO DRY-CLEANING WITH PERC

Fortunately, there are alternatives to conventional dry-cleaning that do not use PERC. However, consumers should beware: many alternatives that are promoted as “organic” or “green” are not harmless to human health and the environment. It is important to understand the distinctions among these choices to be sure your “green” dry cleaner is truly as advertised.

### NOT REALLY GREEN

**Petroleum-based solvents:**<sup>12</sup> Often misleadingly termed “organic,” these solvents are volatile organic carbon (VOC) compounds derived from petroleum with trade names like Stoddard, DF-2000, PureDry, EcoSolve, and Shell Solution 140 HT. The organic claim is attributed to the fact that the synthetic solvents are made of chains of carbon, which is misleading to the average consumer. This is not a true “green” alternative.

**Silicone-based solvents:** D-5, or GreenEarth, replaces PERC with a silicone based solvent called siloxane, which is an extremely persistent chemical with a questionable toxicity profile. Some studies have revealed an increased risk of uterine cancer in laboratory animals, which concerned the Environmental Protection Agency (EPA) that it may be a carcinogen.<sup>13</sup> Also, manufacturing D-5 requires chlorine, which can release carcinogenic dioxin during manufacture.<sup>14</sup> This is also not a true “green” alternative.

## TRULY GREEN

**Carbon Dioxide:** A safe alternative to conventional PERC dry cleaning, this method pressurizes carbon dioxide (recycled from other processes) into a liquid solvent that cleans the garment. However, because the equipment for this alternative is costly, few dry cleaners are adopting this approach.<sup>15</sup> Also, beware: some carbon dioxide cleaners use a Solvair machine that adds the toxic solvent glycol ether to the process, which disqualifies it as being truly “green.”

### **BEST OPTION—Professional Wet Cleaning:**

This is the preferred method as it uses no toxic chemicals, produces no hazardous waste or air pollution, and is extremely energy-efficient.<sup>16</sup> Most clothes labeled dry clean can in fact be cleaned using water as long as conditions are precisely controlled using specialized computerized systems.<sup>17</sup>

Professional wet cleaning machines mechanically simulate hand-washing by using a computer to carefully control the rotation of the drum to minimize agitation while providing sufficient movement for effective cleaning of delicate garments. The method also relies on specially formulated detergents that are precisely dosed and timed during the wash cycle and specialized finishing equipment. Wet clean dryers are equipped with moisture sensors to ensure that garments retain the appropriate amount of moisture after the dry cycle is complete. Specialized pressing machines are then used to enhance the restoration of constructed garments, such as suit jackets, suit pants, and tailored items.<sup>18</sup>

**Find wet-cleaners or carbon dioxide cleaners in your area: [www.nodryclean.com](http://www.nodryclean.com).**

## WASH YOUR CLOTHES IN COLD WATER AND AIR DRY WHEN POSSIBLE

Thirty-six percent of total household hot water is used for laundering.<sup>20</sup> Therefore, switching to cold water during washing is a great opportunity to reduce the cost and carbon footprint of your lifestyle. Experts estimate that 30 million tons of carbon dioxide could be saved each year if all U.S. washers simply switched to cold water. For households with electric dryers, this switch would translate to an 85 percent savings on electricity used for washing.<sup>21</sup> As an added bonus, cold-water washing and the minimization of drying and ironing has a positive impact on the brightness and durability of your wardrobe. For those who worry about the reduced effectiveness of washing in coldwater, a number of brands have developed coldwater specific detergents that claim to remove stains even better than conventional competing detergents.<sup>22</sup>

## Wash At Home With Professional Results: Two Former Fashionistas Have Developed Products to Wash ‘Dry-clean Only’ Garments At Home

Lindsey Wieber Boyd and Gwen Whiting, co-founders of The Laundress, created an eco-chic line of specialty detergents and fabric care instructions to allow professional cleaning results in the comfort and ease of your home. “We knew about 90 percent of items that were labeled dry-clean only were washable,” says Wieber Boyd.<sup>19</sup> So the pair created an eco-friendly line of products ranging from detergents to fabric conditioner to all-purpose bleach. The company offers helpful instructional videos to guide you through successfully washing all kinds of garments—from cashmere and silk to viscose rayon. For more information, visit: [www.thelaundress.com](http://www.thelaundress.com).





## CLEAN BY DESIGN RECOMMENDATIONS:

### Consumers

- Seek wet-cleaning facilities for the pieces in your wardrobe that need special care, and use cold water wash for your routine laundry at home. Line dry when possible.
- Encourage your dry-cleaner to learn more about the viability of professional wet cleaning.

### Designers

- Strive to use fabrics and create garments that do not need to be dry-cleaned.
- Promote cold water wash on care tags.
- Include information about consumer care alternatives in stores and on company websites, and use wet-cleaning facilities for dry cleaning samples.

### Utility Companies and Federal Agencies

- Energy utilities: Develop incentive programs for cleaners to switch to professional wet cleaning.
- The EPA: Phase out PERC dry cleaning and encourage the conversion of professional wet cleaning and carbon dioxide dry cleaning establishments.
- The Federal Trade Commission: Move forward with a “professional wet cleaning” care label for garments that cannot be processed at home, and require a wet cleaning label when a reasonable basis has been established.

<sup>1</sup> “Toxicological Profile for Tetrachloroethylene (PERC)”. Agency for Toxic Substances and Disease Registry (ATSDR). U.S. Department of Health and Human Services: <http://www.atsdr.cdc.gov/toxprofiles/tp.asp?id=265&tid=48>. 1997.

<sup>2</sup> Ibid.

<sup>3</sup> Ibid.

<sup>4</sup> “Plain English Guide for Perc Cleaners”. USEPA: <http://www.epa.gov/dfe/pubs/garment/perc/index.htm>. 1996.

<sup>5</sup> USEPA: State Coalition for Remediation of Dry Cleaners. <http://www.drycleancoalition.org/download/news1210.pdf>. 2010.

<sup>6</sup> “Common Chemicals Found At Superfund Sites”. USEPA: <http://www.epa.gov/oerpage/superfund/health/contaminants/radiation/chemicals.htm>. 2011.

<sup>7</sup> “Fact Sheet: Dry Cleaners and PCE”. Colorado Department of Public Health and the Environment: <http://www.cdph.state.co.us/hm/drycleaner.pdf>. 2002; Thomas et al. Agency for Toxic Substances and Disease Registry (ATSDR).

<sup>8</sup> “Fact Sheet: TETRACHLOROETHENE (PERC) IN INDOOR AND OUTDOOR AIR”. NYSDOH. May 2003. Page 3-4.

<sup>9</sup> Zandonella, Catherine. “EPA Okay’s California PERC Ban”. <http://www.simplesteps.org/health/youths-adults/epa-oks-californias-perc-ban>. March 11, 2011.

<sup>10</sup> “EPA- PERCHLOROETHYLENE BAN”. Illinois General Assembly. <http://www.ilga.gov/legislation/BillStatus.asp?GA=97&DocTypeID=SB&DocNum=1617&GAID=11&SessionID=84&LegID=57565>. 2011.

<sup>11</sup> “Wet Cleaning”. TURI website: [http://www.turi.org/community/wet\\_cleaning](http://www.turi.org/community/wet_cleaning). 2010.

<sup>12</sup> Manning, J. “Are There Realistic Dry-Cleaning Alternatives to Perc?” Environmental Chemistry. <http://environmentalchemistry.com/yogi/environmental/200605drycleaning.html>. 2006.

<sup>13</sup> “Siloxane D5 in Dry Cleaning Applications Fact Sheet”. USEPA Office of Pollution Prevention and Toxics. <http://www.epa.gov/dfe/pubs/garment/d5fs3.pdf>. 2005.

<sup>14</sup> Dos Santos, Alissa. “Green America”. <http://www.greenamerica.org/pubs/realgreen/articles/drycleaning.cfm>. 2009.

<sup>15</sup> Ibid.

<sup>16</sup> Sinsheimer P (2008) Comparison of Electricity and Natural Gas Use of Five Garment Care Technologies. Southern California Edison Design & Engineering Services.

<sup>17</sup> Sinsheimer Peter, Grout Cyrus, Namkoong Angela, Gottlieb, Robert, Latif Abid (2007) The Viability of Professional Wet Cleaning as a Pollution Prevention Alternative to Perchloroethylene Dry Cleaning Journal of the Air & Waste Management Association 57:172–178.

<sup>18</sup> Id at 19.

<sup>19</sup> “About The Laundress”. The Laundress: <http://www.thelaundress.com/AboutUs/about-us.asp>. 2010.

<sup>20</sup> Sabaliunas, D., Pittinger, C., Kessel, C., Masscheleyn, P. “Residential Energy Use and Potential Conservation Through Reduced Laundering Temperatures in the United States and Canada”. 2006.

<sup>21</sup> Cook, Orrin. “Wash and rinse in cold water”. <http://www.terrapass.com/blog/posts/energy-tip-17-w>. October 2006.

<sup>22</sup> “Tide Cold Water Liquid Laundry Detergent: Product Info”. <http://www.tide.com/en-US/product/tide-coldwater.jsp>. 2011.

<sup>23</sup> “Think Climate - Wash Your Clothes at 30 Degrees Celsius”. M&S: <http://plana.marksandspencer.com/we-are-doing/climate-change/stories/35/>. 2011.

