



Comparison of wet-cleaning and dry-cleaning methods

If you are currently using perchloroethylene (PCE or “perc”) as your dry-cleaning solvent of choice, you are not alone. For years, perc has been the “go to” dry-cleaning solvent used most often by those in the professional dry-cleaning industry. Not only an effective and easy-to-use cleaner, perc is relatively inexpensive when compared to other solvents. Although perc can damage certain fabrics, such as leather and suede, it has the reputation of being able to effectively clean a wide range of materials. Despite such positive performance, the dry-cleaning industry is also becoming more aware of the negatives associated with perc in terms of potential environmental impacts, and worker health and safety concerns. For this reason, many in the industry have considered other possible options, and some have even “taken the plunge” by switching to a wet-cleaning method, or making a change to another petroleum (petro) or other non-perc dry-cleaning method.

In 2012, of approximately 143 total dry-cleaning machines registered in Kansas, the type of solvent used falls into one of three general categories in the chart below:

Solvent	Machines	Percent of total
Perc	63	44
Petro or other non-perc	67	47
GreenEarth®	13	9

Presently, perc machines alone account for nearly 44 percent of total registered machines, down from nearly 70 percent over the past 10 years. From a pollution prevention standpoint, eliminating perc use,

and switching to wet-cleaning or a different non-perc dry-cleaning method, is a step in the right direction toward reducing hazardous air pollutants and other environmental contamination, as well as decreasing incidental risk to worker health.

At this point, you might wonder what are other possible options to consider instead of continuing to use perc in your dry-cleaning operation. Answers to that question can be found in the June 2012 Massachusetts Toxics Use Reduction Institute (TURI) report titled *Assessment of Alternatives to Perchloroethylene for the Dry Cleaning Industry* (available at <http://www.turi.org/>). TURI presents detailed information on seven alternatives in comparison to perc: professional wet cleaning, liquid carbon dioxide, high-flashpoint hydrocarbons, acetal, propylene glycol ethers, siloxane, and n-propyl bromide. Although some of these chemical names may sound unfamiliar, you may recognize more common trade names such as GreenEarth® D5 solvent (or siloxane) and SolvonK4 (or acetal). The table on page 2 provides a general summary of these different wet-cleaning and dry-cleaning methods. The bottom line is that in order to reduce your regulatory burden, while better protecting the environment and promoting worker safety, an upfront capital investment would likely need to be made. You will need to decide if the cost benefit is right for your particular situation.

For additional assistance

If you need help in understanding your options, you may also contact the Kansas Small Business Environmental Assistance Program (SBEAP) by calling our toll-free hotline at 800-578-8898, or by visiting our website at <http://www.sbeap.org/> for confidential and free technical assistance.

Comparison of perchloroethylene and seven other wet-cleaning or dry-cleaning methods

KEY CRITERIA	Perc	Alt 1*	Alt 2*	Alt 3*	Alt 4*	Alt 5*	Alt 6*	Alt 7*
Equipment cost	Low	Low	High	Low	Moderate	Low	Low	Low
Chemical cost per gallon	Low	Moderate	High	Low	Moderate	Moderate	Moderate	High
Cost per pound cleaned	Moderate	Low	Moderate	Low	Not available	Moderate	High	Not available
Hazardous air pollutant (HAP)	Yes	No	No	No	No	No	No	No
Volatile organic compound (VOC)	Exempt	No	No	Yes	Yes	Yes	Exempt	Yes
Hazardous waste disposal required**	Yes	No	No	No	No	No	No	No
Carcinogenicity	Probable human	Not classified	Not classified	Not classified	Not classified	Not classified	Some evidence	Evidence in animals
Central nervous system effects	Yes	No	No	Yes	No data available	Yes	Some evidence	Yes
Recommended exposure limits (in parts per million or ppm)	25	Not available	5,000	100	Not available	Not available	10	10

*Alternative (Alt) 1 = professional wet cleaning (e.g., Miele or AquaSolo)
 Alt 3 = high-flashpoint hydrocarbons (e.g., DF2000™ Fluid or EcoSolv®)
 Alt 5 = propylene glycol ethers (e.g., Gen-X® or Rynex 3®)
 Alt 7 = n-propyl bromide (e.g., Drysolve® or Fabrisolv™ XL)

Alt 2 = carbon dioxide (e.g., Solvair®)
 Alt 4 = acetal (e.g., SolvonK4)
 Alt 6 = siloxane (e.g., GreenEarth® D5 solvent)

**Special waste disposal authorization may be required in Kansas.

Adapted from *Massachusetts Safer Alternatives Fact Sheet—Alternatives to Perchloroethylene Used in Professional Garment Care*, Massachusetts TURI, June 2012 (available at <http://www.turi.org/>).

This publication was created by Kansas State University's Pollution Prevention Institute through the Small Business Environmental Assistance Program (SBEAP). SBEAP's mission is to help Kansas small businesses comply with environmental regulations and identify pollution prevention opportunities. SBEAP is funded through a contract with the Kansas Department of Health and Environment. SBEAP services are free and confidential. For more information, call 800-578-8898, send an e-mail to sbeap@ksu.edu, or visit our Web site at www.sbeap.org. Kansas State University is an EEO/AA provider.

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