



## Could your family be affected?

In the United States, about 70% of all dry cleaners use perchloroethylene, a known toxic air pollutant, as the cleaning solvent.

— International Fabricare Institute

A dry cleaner can reduce perchloroethylene use by 70% by converting from transfer equipment to a closed-loop dry-to-dry system. For a typical dry cleaner, this would result in a savings of about \$1,100 per year.

— Washington State Department of Ecology



# Reducing Air Pollution from: Dry Cleaning Operations

## Why should my dry cleaning operation prevent air pollution?

People who are exposed to toxic air pollutants at sufficient concentrations, for sufficient durations, may increase their chances of getting cancer or experiencing other serious health effects, such as reproductive problems, birth defects, and aggravated asthma.

Pollution prevention safeguards the health of your employees, customers, and families by using materials, processes, or practices that reduce or eliminate air pollution at the source. For example, ensuring proper drying time minimizes air pollution.

Pollution prevention practices also save money on waste disposal, solvent usage, and the cost of air pollution controls.

You may already be regulated by federal, state, local, and Tribal agencies and may already voluntarily implement pollution prevention practices. However, increasing pollution prevention efforts can further minimize impacts on human health and the environment.

## Why should I be concerned about air pollution from my dry cleaning operation?

- The main source of toxic air pollutants from dry cleaners is the solvent used in the cleaning process. The most commonly used solvents are perchloroethylene and petroleum solvents.
- Perchloroethylene is a known toxic air pollutant. While federal, state, local, and Tribal regulations limit the amount of emissions from dry

cleaners, dangerous releases of toxic air pollutants can occur if a dry cleaner does not operate in compliance with regulations.

- Petroleum solvents used in dry cleaning operations can release some toxic air pollutants and volatile organic compounds (VOC). Chemicals in these substances can react in the air to form ground-level ozone (smog), which has been linked to a number of respiratory effects.

## How can I reduce air pollution from my dry cleaning operation?

### Lower Emissions at the Source

- Check hoses, couplings, pumps, valves, and gaskets frequently for leaks. Use a halogenated leak detector to help identify leaks. These detectors usually cost about \$250.
- Repair leaks promptly.
- Allow drying cycle to complete before opening the door. "Short cycling" reduces the effectiveness of solvent recovery equipment and increases fugitive emissions of solvents from the machine.
- Replace cartridge filters with spin disk filters that can be cleaned without opening.
- Cover containers of solvents to reduce solvent loss from evaporation and fugitive emissions of toxic air pollutants and VOC. This reduces worker exposure and releases of these pollutants to the outside air.
- Prevent spills by dispensing materials with spigots and pumps.

*An on-site distillation unit may recover as much as 90% of solvents used. This reduces solvent purchases and disposal costs.*

— U.S. EPA

### Modify Processes

- Reduce process vent emissions by using a closed-loop dry-to-dry machine with a refrigerated condenser. The addition of a carbon adsorber can further reduce emissions by recovering solvents.
- Load the machine properly. Overloading reduces the effectiveness of solvent recovery equipment. Underloading makes less efficient use of the solvent.
- Recover solvents from filter cartridges by draining the filters for 24 hours in the filter housing to capture additional solvent before disposal.
- Install spill containment structures under and around your dry cleaning machine.
- Evaluate investment in a closed-loop dry-to-dry machine or other innovative cleaning technologies. Compare initial costs with savings, over time, in lower raw material and hazardous disposal costs.

### Recycle Materials

- Install equipment, such as refrigerated condensers, to recover solvent from the dry cleaning process.

### Change Technologies

- Change to technologies such as wet cleaning, liquid CO<sub>2</sub>, and silicone-based cleaning machines.
- Wet cleaning processes use water and detergent to clean clothes that typically require dry cleaning.
- Liquid CO<sub>2</sub> technology is non-toxic, non-combustible, and does not contribute to toxic air pollutant and VOC emissions.

- Silicone-based cleaning machines do not contain any toxic air pollutants or VOC and are odorless and affordable.

### Why should I consider changing processes?

Changing your dry cleaning process to upgrade equipment, or switching to alternative garment cleaning processes, can be relatively inexpensive and can result in cost savings and dramatic pollution reduction. Case studies show that replacing transfer equipment, or converting to closed-loop machines, can save up to 70% of your perchloroethylene use and pay back the investment in as little as 3 years.

### What else can I do to reduce air pollution?

Your community may already have groups working for cleaner air. Your expertise and knowledge can be very helpful to these groups.

Many pollution prevention offices offer free on-site assessments for interested businesses. A list of these small business assistance programs can be found at [www.epa.gov/smallbusiness](http://www.epa.gov/smallbusiness). This site provides information about assistance and technical help, environmental experts, environmental regulations and laws, funding, and cost-saving opportunities.

Sponsor employee awards for good ideas, great efforts, and dedication to pollution prevention. For example, you could provide a cash award for workers who implement a work practice that reduces both costs and pollution.

*The Cleaner Technologies Substitute Assessment for Professional Fabricare Processes is a technical report that presents relative risk, cost, and performance information on existing and new cleaning technologies.*

— U.S. EPA Design for the Environment

*By switching to a petroleum-based dry cleaning machine, a Maine dry cleaner reduced its waste by 90% and its operating costs by \$10,000. Its solvent consumption dropped from 800 gallons per year to 200 gallons per year.*

— Maine Department of Environmental Protection





## Could your family be affected?

The Indiana 5-Star Environmental Program for Dry Cleaners is a voluntary program that ranks participating dry cleaners on a scale of one to five stars. The program recognizes those dry cleaners willing to do more for the environment and worker safety than the rules require. Many shops have found this to be a very beneficial advertising and marketing tool.

— Indiana Office of Pollution Prevention and Technical Assistance

A refrigerated condenser can reduce emissions from transfer machines by 85% and from dry-to-dry machines by 95%. Also, replacing transfer equipment or converting to closed-loop machines can reduce perchloroethylene use by up to 80% and pay back the investment in as little as 3 years.

— Hawaii Department of Health



## Resources

- International Fabricare Institute: [www.ifi.org](http://www.ifi.org), (800) 638-2627
- International Dry Cleaners Congress: [www.idcnews.org](http://www.idcnews.org)
- Neighborhood Cleaners Association: [www.nca-i.com](http://www.nca-i.com)
- Community-Based Projects: [www.epa.gov/air/toxicair/community.html](http://www.epa.gov/air/toxicair/community.html)
- EPA Air Toxics Web Site: [www.epa.gov/ttn/atw/](http://www.epa.gov/ttn/atw/)
- National Emission Standards for Hazardous Air Pollutants: Dry Cleaners: [www.epa.gov/ttn/atw/dryperc/dryclpg.html](http://www.epa.gov/ttn/atw/dryperc/dryclpg.html)
- Dry Cleaning Industry Sector Notebook: [www.epa.gov/compliance/resources/publications/assistance/sectors/notebooks/dry.html](http://www.epa.gov/compliance/resources/publications/assistance/sectors/notebooks/dry.html)
- Indiana 5-Star Environmental Recognition Program for Dry Cleaners: [www.in.gov/idem/ctap/cleaners/5stindex.html](http://www.in.gov/idem/ctap/cleaners/5stindex.html)
- Fact sheet: [www.cdphe.state.co.us/el/Documents/DryClean/4DCFactSht.pdf](http://www.cdphe.state.co.us/el/Documents/DryClean/4DCFactSht.pdf)
- Dry Cleaning in the 90s: [www.iwrc.org/pubs/dc.pdf](http://www.iwrc.org/pubs/dc.pdf)
- Waste minimization: [www.state.hi.us/health/environmental/compliance/sb\\_library/drycleanwastemin.pdf](http://www.state.hi.us/health/environmental/compliance/sb_library/drycleanwastemin.pdf)

### U.S. EPA Design for the Environment

- Garment and Textile Care Partnership: [www.epa.gov/oppt/dfe/projects/garment/index.htm](http://www.epa.gov/oppt/dfe/projects/garment/index.htm)
- Case study: [www.epa.gov/oppt/dfe/pubs/garment/wsgc/wetclean.pdf](http://www.epa.gov/oppt/dfe/pubs/garment/wsgc/wetclean.pdf)
- Training curriculum: [www.epa.gov/oppt/dfe/pubs/garment/tech\\_rep/clothes.pdf](http://www.epa.gov/oppt/dfe/pubs/garment/tech_rep/clothes.pdf)

### Guides

- Pollution prevention guide: [www.dnrec.state.de.us/DREC/p2/DryClean.htm](http://www.dnrec.state.de.us/DREC/p2/DryClean.htm)
- Pollution Prevention Dry Cleaning Operations: Pinellas County Department of Environmental Management, Pinellas County, Florida: [www.pinellascounty.org/Environment/pagesHTML/PollutionPrevent/p2r2PDFs/mangmentPDFIndustry/DrycleanBooklet.pdf](http://www.pinellascounty.org/Environment/pagesHTML/PollutionPrevent/p2r2PDFs/mangmentPDFIndustry/DrycleanBooklet.pdf), 727-464-4761
- Dry Cleaning Guide: [www.ecy.wa.gov/pubs/0104018.pdf](http://www.ecy.wa.gov/pubs/0104018.pdf)
- Pressing Concerns: A Complete Guidebook to Environmental Compliance for Colorado Dry Cleaners: [www.cdphe.state.co.us/el/ecac/dcguide/Dry\\_Cleaner\\_Guidebook.html](http://www.cdphe.state.co.us/el/ecac/dcguide/Dry_Cleaner_Guidebook.html)
- A Guide for Perc Dry Cleaners: [www.state.hi.us/health/environmental/compliance/sb\\_library/dryclean\\_perc\\_guide.pdf](http://www.state.hi.us/health/environmental/compliance/sb_library/dryclean_perc_guide.pdf)

### Toxicity of Solvents

- Integrated Risk Information Systems (IRIS): [www.epa.gov/iris](http://www.epa.gov/iris)
- Air Toxics Health Effects Notebooks: [www.epa.gov/ttn/hapindex.html](http://www.epa.gov/ttn/hapindex.html)