



# Perchloroethylene Air Emissions

## Potential Environmental Impacts

Perchloroethylene (perc), also called tetrachloroethylene, is classified as a probable carcinogen by the U. S. Environmental Protection Agency (EPA). Perc vapors are most easily taken in via inhalation and can impact the liver and kidneys. Perc vapors have also been found to contaminate drinking water wells - see the Shop Wastewater Fact Sheet for more information.

## Legal Requirements

- ◆ All dry cleaners using perchloroethylene are considered a source of air emissions and must comply with environmental regulations. [40 CFR 63 M, RCSA Section 22a-174-29 (Maximum Allowable Stack Concentration) and Section 22a-174-20(w) (Dry Cleaning CTG)]

Dry cleaning facilities and machines are classified in three ways:

1. Type of cleaning machine (dry-to-dry, transfer or reclaimer) located at the facility. (*See definitions at the end of this fact sheet.*)

2. Date of installation of each machine.

**Existing** machine: Dry-to-Dry machine installed/reconstructed before December 9, 1991  
Transfer machine installed/reconstructed before December 9, 1991

**New** machine: Dry-to-Dry machine installed on or after December 9, 1991

**No new transfer systems may be installed.**

3. Facility source classification based on annual perchloroethylene consumption.

My shop has these:	SOURCE CLASSIFICATION: 12 consecutive month shop perc consumption (gallons)		
	Small	Large	Major <sup>2</sup>
Only Dry-to-Dry machines	less than 140	140 - 2,100	more than 2,100
Only Transfer Machines <sup>1</sup>	less than 200	200 - 1,800	more than 1,800
Both Dry-to-Dry & Transfer Machines <sup>1</sup>	less than 140	140 - 1,800	more than 1,800

Note (1) All transfer machines must have been installed before December 9, 1993.

Note (2) Major sources must contact CT DEP and apply for a New Source Review permit and a Title V permit before operating.

## Existing Machines - Small Source Requirements

Requirement Category	Requirement
Process Vent Emissions	Existing facilities - none New facilities - Refrigerated condenser or the equivalent control device
Fugitive Emissions	Room enclosure, sealed containers, leak detection and repair schedule.
Operation & Maintenance	<ul style="list-style-type: none"> <li>• No new transfer systems may be installed.</li> <li>• Keep machine door closed at all times, except when actually transferring clothes.</li> <li>• Drain cartridge filters in sealed container for a minimum of 24 hours.</li> <li>• Store solvent product and wastes in closed tanks with no leaks.</li> <li>• Inspect "all" equipment for perceptible leaks bi-weekly. <i>(See definition at the end of the fact sheet.)</i> <ul style="list-style-type: none"> <li>– The leak check shall include inspection of the following: Hose and pipe connections, Fittings, Couplings and Valves, Door gaskets and Seatings, Filter gaskets and Seatings, Solvent tanks and containers, Pumps, Water separators, Cartridge filter housings, Muck cookers, Stills, Exhaust dampers and Diverter valves.</li> </ul> </li> <li style="padding-left: 40px;">Repair all leaks within 24 hours (if parts must be ordered, must do so within 2 days and installed within 5 days).</li> <li>• Operate and maintain system according to manufacturers specifications and recommendations.</li> <li>• Keep each machine's specifications and operating manuals on-site.</li> </ul>
Record keeping and Reporting	<ul style="list-style-type: none"> <li>• Keep receipts of all perc purchases.</li> <li>• Maintain a log of volume of perc purchased each month. (If none purchased enter zero in log)</li> <li>• Maintain a log of calculated "rolling 12 month" perc consumption.</li> <li>• Maintain a log of dates and details of biweekly inspections for leaks.</li> <li>• Maintain a log of dates and all repairs and parts orders.</li> <li>• Records shall be retained on premise indicating continual compliance with all above conditions at all times. These records shall be made available upon request by the EPA Administrator and/or the CT DEP Commissioner for a period of 5 years.</li> <li>• Maintain a log of dates and temperature sensor monitoring results, if a refrigerated condenser is used</li> <li>• Maintain a log of dates and colorimetric detector tube monitoring results, if a carbon adsorber is used for compliance.</li> </ul>

Notification	<p>All notifications and reports must be submitted to the U.S. Environmental Protection Agency at the following address:</p> <p>Director, Air Compliance Program; U.S. EPA New England; One Congress Street (SEA); Suite 1100; Boston, MA 02114-2023; Attn: MACT Compliance Clerk</p> <p>Existing source notifications were due June 18,1994. Were required to include: name and address of owner or operator; address of facility; type of machines; annual perc consumption; control device information; and documentation on room enclosure within 30 days after startup.</p>
Compliance Report	Submit Compliance Report for Pollution Prevention & Air Pollution Control to EPA. See address above.
Increase in annual perc consumption	If annual perc consumption increases to the Large Source threshold, you must comply with Large Source requirements.
Title V Permit	Required for "Major sources" only. For "Small and Large" sources, deferred until 12/9/2004 & maybe permanently (EPA working on rule). Contact CT DEP Air Bureau for more information at (860) 424-4152.

## Existing Machines - Large Source Requirements

Large Sources must meet all of the above requirements for Small Sources, plus the following:

Requirement Category	Requirement
Process Vent Emissions	<p>Existing facilities - Refrigerated Condenser or the equivalent control device. Carbon Adsorbers installed prior to September 22, 1993 do not need to be replaced.</p> <p>New facilities - Refrigerated Condenser or the equivalent control device.</p>
Fugitive Emissions	Room enclosure, sealed containers, leak detection and repair schedule. No new transfer systems may be installed.
Operation & Maintenance	<p>Maintain a log of details of weekly inspections for leaks.</p> <p>If annual perc consumption increases to the Major Source threshold, you must comply with Major Source requirements.</p>

## Major Source Requirements

Major sources must meet all of the above requirements for Large and Small Sources, plus the following:

Process Vent Emissions	<ul style="list-style-type: none"> <li>Existing facilities - Refrigerated Condenser or the equivalent control device. Carbon Adsorbers installed prior to September 22, 1993 do not need to be replaced.</li> <li>New facilities - Refrigerated Condenser or the equivalent control device followed by a small Carbon Adsorber.</li> </ul>
Fugitive Emissions	<ul style="list-style-type: none"> <li>Room enclosure, sealed containers, leak detection and repair schedule. No new transfer systems may be installed.</li> </ul>

## Compliance Options Standards

The following options apply to all sources.

Option 1 Room Enclosure	<ul style="list-style-type: none"> <li>Exhaust all air from the room enclosure through a carbon adsorber or an equivalent control device.</li> <li>Shall be equipped with a carbon adsorber that is not the same carbon adsorber used to comply with existing dry cleaning systems or dry cleaning systems at major sources.</li> </ul> <p>Transfer Machine System (Applicable for Major Sources only)</p> <ul style="list-style-type: none"> <li>Room enclosure shall be constructed of materials impermeable to perc.</li> <li>Room enclosures shall be designed and operate at negative pressure at each opening at all times that the machine is in operation.</li> </ul>
Option 2: Refrigerated Condenser	<ul style="list-style-type: none"> <li>Exhaust only through refrigerated condenser.</li> <li>Never bypass condenser to vent to atmosphere.</li> <li>Monitor for exhaust temperature (not to exceed 45 degrees F - with a device capable of +/- 2 degrees F accuracy) at least weekly.</li> <li>Have diverter valve to prevent air drawn into the machine when the door is open from passing through the refrigerated condenser.</li> <li>Monitor for condenser inlet &amp; exhaust temperature difference (must be at least 20 degrees F - with a device capable of +/- 2 degrees F accuracy) at least weekly.</li> <li>Have a separate refrigerated condenser (must not use the same condenser as for any dry-to-dry, dryer or reclaimer machine).</li> </ul>
Option 3: Carbon Adsorber Device (only if installed before September 22, 1993)	<ul style="list-style-type: none"> <li>Only vent through carbon adsorber.</li> <li>Never bypass vent.</li> <li>Monitor perc concentration in exhaust at least weekly with a colorimetric detector tube, while the dry cleaning machine is venting to that carbon adsorber at the end of the last dry cleaning cycle prior to desorption of that carbon adsorber. The maximum allowed perc concentration is 100 ppm.</li> </ul>

	<ul style="list-style-type: none"> <li>• Use a colorimetric tube designed to measure a concentration of 100 ppm of perc in air to an accuracy of +/- 25 ppm, in accordance with the manufacturers instructions.</li> <li>• Use a sampling port located at least 8 duct diameters downstream from any flow disturbance (such as a bend, expansion, contraction or outlet) in the exhaust duct and 2 duct diameters upstream from any such flow disturbance.</li> <li>• Operating adjustments or repairs must be initiated if exhaust temperature or perc concentration limits are exceeded - same time requirements as any other repairs.</li> </ul>
Option 4: Equivalent Emission Control Technology	Any person requesting that the use of certain equipment or procedures be considered Equivalent Emission Control Technology shall submit information to the EPA Administrator.
Record Keeping	Maintain a log of dates and monitoring results and show it upon request for a period of 5 years. These records shall be made available upon request by the EPA Administrator and/or the CT DEP Commissioner.

## New Machines - Small & Large Source Requirements

Any Dry-to-Dry machine installed on or after December 9, 1991 is a "new machine"

Federal regulations require that you "Eliminate **ANY** emission of perchloroethylene during the transfer of articles between the washer and dryer(s)." This requirement effectively eliminates the legal use of any transfer machine installed after December 22, 1993.

All other requirements remain the same as for the two "existing machines" source categories shown above.

## Best Management Practices

- ★ Track your "solvent mileage" for each machine to see which machines are most and least efficient. Solvent mileage is the gallons of perc used per 1,000 pounds of garments processed. Keep track of the pounds of garments processed in each machine per week and the amount of perc added per week. Plan ahead to replace the least efficient machine when business needs dictate.
- ★ Follow the manufacturers recommendations when loading the machine. Under loading wastes perc and overloading reduces cleaning effectiveness.
- ★ Switch to wet cleaning at the local shop and send items that must be cleaned with solvents to a larger, regional shop.

## Definitions

Term	Definition
Dry-to-dry machine	A one-machine dry cleaning operation in which washing and drying are performed in the same machine
Transfer machine system	A multiple-machine dry cleaning operation in which washing and drying are performed in different machines. Examples include: (1) a washer and dryer, (2) a washer and a reclaimer, or (3) a dry-to-dry machine and reclaimer.
Perceptible leak	A leak that can be determined by the odor of perc, visual observation such as pools of liquid or droplets, or by passing the fingers over the surface of equipment. No special equipment is needed.

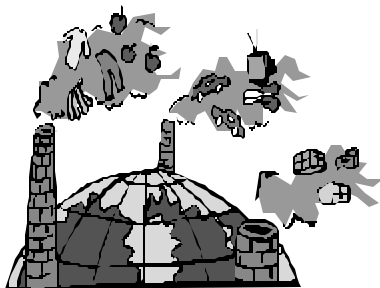
## Pollution Prevention Checklist

✓ Do you track your equipment solvent mileage every week?

YES

NO

N/A



### Did you know?

Dry cleaners use approximately 192 million pounds of perc each year.

### 2004 Garment Care Fact Sheets

Connecticut Department of Environmental Protection, 79 Elm Street, Hartford, CT 06106-5127  
Office of Pollution Prevention (860) 424-3297 [www.dep.state.ct.us/wst/p2/garcare/gcindex.htm](http://www.dep.state.ct.us/wst/p2/garcare/gcindex.htm)  
Fact Sheet: DEP-P2-GARMENT CARE-FS-009 Last Updated: September, 2004