



Emission Standards for Perchloroethylene Dry Cleaning Facilities

The U.S. Environmental Protection Agency (EPA) has a National Emission Standard for Hazardous Air Pollutants (NESHAP) for the control of perchloroethylene (perc) releases from dry cleaning facilities. Perc is suspected of causing cancer in humans.

These emission standards are different from hazardous waste regulations. They are based on purchase of perc, not generation of perc-related drained spent cartridge filters, still bottoms, or filter muck waste.

These emission standards are different from the Minnesota Occupational Safety and Health Administration (OSHA) regulations that set a time-weighted average of 25 ppm of perc as the exposure limit for employees.

Coin-operated dry cleaning facilities and facilities that do not use perc are exempt from these requirements.

See the chart below for an overview of requirements. Additional requirements for perc machines located in a building with a residence are given on page two.

Overview of requirements

		Small Area Sources*	Large Area Sources*	Major Sources*
		Purchase less than 140 gallons perc/year:	Purchase equal to or between 140-2,100 gallons perc/year:	Purchase more than 2,100 gallons perc/year:
Dry-to-dry facilities constructed or reconstructed:				
Process vent control	Before December 9, 1991	Dry-to-dry machine	Dry-to-dry machine with RC** (CA installed before September 22, 1993, can remain; it does not have to be replaced by RC)	
	On or after December 9, 1991, but before December 21, 2005	Closed loop, dry-to-dry machine with RC**		Closed loop, dry-to-dry machine with RC** followed by CA** operated immediately before or as the door is opened
	On or after December 21, 2005	Closed loop, dry-to-dry machine with RC** followed by CA** operated immediately before the door is opened		
Fugitive control	All dates	Sealed containers; leak detection/repair By July 28, 2008, eliminate all transfer machines		
Monitoring	All dates	If a RC is present, monitor high pressure and low pressure gauge or temperature on RC. If a CA is present, use a colorimetric detector tube or a perc gas analyzer to monitor.		
Inspections	All dates	Inspect weekly for perceptible leaks (those you can see, feel, or smell). Inspect for vapor leaks on a monthly basis using a halogenated hydrocarbon detector or a perc gas analyzer. Repair leaks and maintain records.		Inspect weekly for perceptible leaks. Inspect for vapor leaks on a monthly basis using a perc gas analyzer and operate it according to EPA Method 21. Repair leaks and maintain records.
Reporting	All dates	Submit a notification of compliance status form within 30 days of startup. This notification is required when a new machine is installed at an existing site. The form is available at www.pca.state.mn.us/programs/sbap-sectors.html#drycleaners .		

*Area sources are permanently exempted from air permitting requirements. All major sources need Part 70 (federal) air quality permits.

**or equivalent control

Refrigerated Condenser (RC)

Carbon Adsorber (CA)

Perc machines located in a building with a residence – additional requirements

Perc machines located in a building with a residence have additional requirements. See the definition of residence on page four.

When your current perc machine wears out, you must not replace it with another perc machine. You must not install a perc machine, including relocating a used machine, after December 21, 2005.

By July 27, 2006

If you did install a perc machine on or after December 21, 2005, but before July 13, 2006, you must meet these requirements:

- Operate a dry cleaning system inside a vapor barrier enclosure. Operate the exhaust system for the enclosure at all times the dry cleaning system is in operation and during maintenance. Ensure that the entry door to the enclosure is open only when a person is entering or exiting the enclosure.

- Route the air-perc gas-vapor stream through a refrigerated condenser (RC) and pass the air-perc gas-vapor stream from inside the dry cleaning drum through a carbon adsorber (CA) immediately before the door of the dry cleaning machine is opened. Desorb according to the manufacturer's instructions.
- Inspect for vapor leaks on a weekly basis using a halogenated hydrocarbon detector or a perc gas analyzer. Follow the manufacturer's instructions. Place the probe at the surface where leakage could occur and move it slowly along the surface.

By July 27, 2009

You must eliminate perc machines installed (including the relocation of a used machine) on or after December 21, 2005.

After December 21, 2020

You must eliminate all perc machines located in a building with a residence.

Details of compliance steps

Operation and maintenance

- Close the door of each dry cleaning machine immediately after transferring articles to or from the machine and keep the door closed at all other times.
- Operate and maintain dry cleaning systems according to the manufacturer's specifications and recommendations.
- Operate each RC to not vent or release the air-perc gas-vapor stream contained within the dry cleaning machine to the atmosphere while the dry cleaning drum is rotating. The air-perc vapor should be recirculating back through the machine without venting to the atmosphere (closed loop).
- Operate each RC to prevent air drawn into the dry cleaning machine when the door of the machine is open from passing through the RC.
- Do not bypass a CA at any time.
- Desorb each CA according to the manufacturer's instructions.

Fugitive controls

- Use solvent tanks or containers to store all perc and perc related waste. Ensure that these tanks and containers are closed so that they have no perceptible leaks. You may leave containers for separator water uncovered if it is necessary for proper operation of your machine and still.
- Drain all cartridge filters in their housing, or other sealed container, for a minimum of 24 hours (or treat such filter in an equivalent manner) before removal from the dry cleaning plant.
- Room enclosures located in a building with a residence must be constructed of materials impermeable to perc, and must be designed and operated to maintain a negative pressure at each opening while the dry cleaning machine is operating, and must exhaust to a CA. The room enclosure must be vented to a separate CA or equivalent device and not share a CA in common with a dry cleaning machine.

Details of compliance steps (continued)

Monitoring information

If required monitoring detects values that do not meet the parameters set in the standard, make adjustments or repairs to the dry cleaning system or control device to meet those values. If repair parts are needed, make a written or verbal order within two working days of detecting the value. Install repair parts within five working days after receipt.

Refrigerated condenser (RC) – monitor weekly and follow the manufacturer's instructions

Measure the refrigeration system high pressure and low pressure during the drying phase to determine if they are in the range specified by the manufacturer's operating instructions.

Alternately you may monitor temperature. Measure the temperature of the air-perc gas-vapor stream on the outlet side of the RC to determine if it is equal to or less than 7.2° Celsius (45° Fahrenheit) before the end of the cool down or drying cycle while the gas-vapor stream is flowing through the condenser. The temperature sensor should be designed to measure a temperature of 7.2° Celsius (45° Fahrenheit) to an accuracy of $\pm 1.1^\circ$ Celsius (2° Fahrenheit).

Use the temperature sensor according to the manufacturer's instructions.

Carbon adsorber (CA) - monitor weekly and follow the manufacturer's instructions

If you use a CA instead of a RC or you use a supplemental CA and the exhaust passes through the CA **immediately upon door opening**, measure the concentration of perc in the exhaust of the CA. Use a colorimetric detector tube or perc gas analyzer that measures a concentration of 100 ppm by volume of perc in air to an accuracy of ± 25 ppm by volume. Take the measurement while the dry cleaning machine is venting to the CA at the end of the last dry cleaning cycle prior to desorption of the CA or removal of the activated carbon. The perc concentration needs to be less than or equal to 100 ppm.

A sampling port for monitoring within the exhaust outlet of the CA must be provided in a place that is easily accessible; located at least eight times the diameter of the stack or duct downstream from any flow disturbance (bend, expansion, contraction, or outlet); not downstream from any other inlet; and two times the diameters of the stack or duct upstream from any flow disturbance.

If you use a supplemental CA and the air-perc gas-vapor stream passes through the CA **before the machine door is opened**, measure the concentration of perc in the dry cleaning machine drum at the end of the dry cleaning cycle. Use a colorimetric detector tube or perc gas analyzer that measures a concentration of 300 ppm by volume of perc in air to an accuracy of ± 75 ppm by volume. Place the tube or analyzer into the open space at the rear end of the drum immediately after door opening. The perc concentration needs to be less than or equal to 300 ppm.

Inspection information

Inspection requirements dictate that dry cleaners inspect the following components for leaks while the dry cleaning system is operating.

Perceptible leaks are those you can see, feel, or smell. Inspections for vapor leaks using a halogenated hydrocarbon detector or a perc gas analyzer always suffice for perceptible leak inspections. Follow the manufacturer's instructions.

Place the probe at the surface where leakage could occur and move it slowly along the surface.

- hose and pipe connections, fittings, couplings, and valves
- door gaskets and seatings
- filter gaskets and seatings
- pumps
- solvent tanks and containers
- water separators
- muck cookers
- stills
- exhaust dampers
- diverter valves
- all filter housings

Repair all leaks detected during inspections within 24 hours. If repair parts are needed, make a written or verbal order within two working days of detecting the leak. Install repair parts within five working days after receipt.

Inspect for leaks while the dry cleaning system is operating.

Details of compliance steps (continued)

Records

Retain on site a copy of the design specifications and the operating manuals for each dry cleaning system and each emission control device located at your facility.

Keep receipt of perc purchases and a log of the following information. Maintain such information on site, and show it upon request for a period of five years.

- volume of perc purchased each month
- Calculation and result of the yearly perc consumption as shown. Perform the following calculation on the first day of every month.
 - Sum the volume of all perc purchases made in each of the previous 12 months.

- If no perc purchases were made in a given month, then the perc consumption for that month is zero gallons.
- The total sum calculated is the yearly perc consumption at the facility.
- dates when the dry cleaning system components are inspected for leaks, as specified, and the name or location of dry cleaning system components where leaks are detected
- dates of repair and records of written or verbal orders for repair parts
- date and high and low pressure or temperature sensor monitoring results of RC if required
- date and colorimetric detector tube or perc gas analyzer monitoring results of CA if required

Definitions

CA - carbon adsorber - “sniffer”:

bed of activated carbon into which an air-perchloroethylene gas-vapor stream is routed and which adsorbs the perchloroethylene on the carbon

Colorimetric detector tube: glass tube (sealed prior to use), containing material impregnated with a chemical that is sensitive to perchloroethylene and is designed to measure the concentration of perchloroethylene in air

Dry-to-dry machine: one-machine dry cleaning operation in which washing and drying are performed in the same machine

Existing: began construction or reconstruction before December 9, 1991

Filter: porous device through which perchloroethylene is passed to remove contaminants in suspension (for example lint filter, button trap, cartridge filter, tubular filter, regenerative filter, prefilter, polishing filter, and spin disc filter)

Fugitive emissions: emissions that can not reasonably be collected and emitted through a stack or vent

Halogenated hydrocarbon detector: portable device capable of detecting vapor concentrations of perchloroethylene of 25 parts per million by volume or greater by emitting an audible or visual signal that varies as the concentration changes

New: began construction or reconstruction on or after December 9, 1991

Perc: perchloroethylene

Perc gas analyzer: flame ionization detector, photoionization detector, or infrared analyzer capable of detecting vapor concentrations of perc of 25 ppm by volume

ppm: parts per million

Process vent controls: devices used to control emissions from a vent, stack, or similar device

Residence: any dwelling or housing in which people reside excluding short-term housing that is occupied by the same person for a period of less than 180 days (such as a hotel room)

RC - refrigerated condenser - “chiller”: vapor recovery system into which an air-perc gas-vapor stream is routed and the perc is condensed by cooling the gas-vapor stream

Transfer machine system: multiple-machine dry cleaning operation in which washing and drying are performed in different machines. Examples include, but are not limited to: (1) a washer and dryer, (2) a washer and reclaimer, or (3) a dry-to-dry machine and reclaimer.

Vapor barrier enclosure: room that encloses a dry cleaning system and is constructed of vapor barrier material that is impermeable to perc.

More information

To find this rule on-line go to www.epa.gov/lawsregs/search/40cfr.html, then click Chapter 1, then click on Part 63 (63.1-63.599), then click on 63.1 to 63.569-63.599, then scroll to the Subpart M and open the rule.

The Small Business Environmental Assistance Program (SBEAP) has produced a set of checklists to help Minnesota drycleaners determine if they meet environmental rules. Find the checklists at www.pca.state.mn.us/programs/sbap-sectors.html#drycleaners.

The SBEAP produces a calendar to help Minnesota dry cleaners keep records. Find the calendar at www.pca.state.mn.us/publications/ea-s2-50.pdf.

You may contact the SBEAP at 651-282-6143 or 800-657-3938.