

# Decommissioning perchloroethylene (PERC) dry cleaning machines

## Guide to proper disposal and worker protection



Worker prepares PERC machine to decommission. Photo Stephen G. Whittaker

### About this guide

King County Hazardous Waste Management Program and Washington State Department of Labor and Industries contributed significantly to the development of these recommendations.

These recommendations are based on observations made at two businesses where PERC dry cleaning machines were decommissioned.

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### ADA accommodations

To request materials in another format, call Ecology at 360-407-6831, Relay Service at 711, or TTY at 877-833-6341. Visit [ecology.wa.gov/accessibility](http://ecology.wa.gov/accessibility) or email [ecyadacoordinator@ecy.wa.gov](mailto:ecyadacoordinator@ecy.wa.gov).

## What is decommissioning?

Decommissioning a PERC dry cleaning machine involves “clean closure” and removal of the machine.

- **Clean closure:** The process of cleaning the machine to a standard where it will be accepted by a scrap metal recycler. This process ensures no hazardous waste remains in or on the machine and that the machine is safe to transport.
- **Removal:** The process of disconnecting and physically removing the machine from service and transporting it to a recycling facility.

## How to get started

### Request a consultant

We highly recommend you [request a consultation](#)<sup>1</sup> from the Washington State Department of Labor & Industries (L&I) to ensure you and your workers are protected from PERC during the decommissioning process. This service is free and confidential.

### Follow appropriate safety regulations

During the decommissioning process, you or your workers will need to handle different aspects of a PERC dry cleaning machine: electrical, gas lines, PERC itself. To ensure safety and minimize risk, follow these guidelines.

### Know the levels of PERC

Check [Permissible Exposure Limits \(PEL\)](#)<sup>2</sup> of PERC when transferring fluids and cleaning out tanks. Consider using a calibrated photoionization detection meter to determine these levels:

- Time-weighted average PEL is 25 parts per million (ppm)
- Short-term exposure limit is 38 ppm for any 15-minute period

### Handle electrical equipment carefully

Follow safety protocols and regulations when handling electrical equipment. Use L&I’s [Lockout/Tag-out \(LOTO\)](#)<sup>3</sup> regulations.

<sup>1</sup> [www.lni.wa.gov/Safety/Consultation/default.asp](http://www.lni.wa.gov/Safety/Consultation/default.asp)

<sup>2</sup> [apps.leg.wa.gov/WAC/default.aspx?cite=296-841-20025](http://apps.leg.wa.gov/WAC/default.aspx?cite=296-841-20025)

<sup>3</sup> [www.lni.wa.gov/Safety/Topics/AToZ/LOTO/Default.asp](http://www.lni.wa.gov/Safety/Topics/AToZ/LOTO/Default.asp)

### Prepare to handle plumbing and gas lines

- Be sure you understand the safety protocols related to connecting and disconnecting water lines. Follow L&I's guidance for [plumbing work](#).<sup>4</sup>
- Use safety protocols when connecting or disconnecting gas lines. Read OSHA's [natural gas safety regulations](#).<sup>5</sup>

### Wear proper safety gear at all times

Anyone removing PERC from a dry cleaning machine should wear the following personal protective equipment (PPE):

- Splash-proof safety glasses or face shield
- Chemical-resistant apron or suit
- Extended cuff, chemically-resistant gloves designed for use with PERC. For example, [Nitrile green unlined PERC glove](#) from Cleaner's Outlet.<sup>6</sup>
- Chemical resistant, steel-toed boots (recommended).
- Respirator (refer to [Permissible Exposure Limits \(PEL\)](#)<sup>7</sup>):
  - If your machine has **PERC levels higher than PEL**, contact L&I for a recommended respirator.
  - If your machine has **PERC levels within PEL**, use an R95 particulate respirator with nuisance level organic vapor relief (i.e., with a carbon layer).

For example: [3M™ Particulate Respirator 8247, R95, with Nuisance Level Organic Vapor Relief 120 EA/Case](#).<sup>8</sup>

### Clear a path for removal

Make sure there is enough space to remove the machine from the shop without taking it apart. You may need to deconstruct or remove things such as:

- Clothing racks, chairs, and other objects.
- Countertops.
- Doors.
- Windows.
- Other fixtures.

### Prepare to clean out your PERC machine

- Allow the machine to cool overnight before cleaning it out.
- You will need the following items:
  - Rags and absorbent pads
  - Long-handled rod or similar
  - 5-gallon drum for PERC-soaked rags
  - 55-gallon drum for PERC from the machine
  - At least two box fans per worker.
- Set up proper ventilation. Use two box fans to direct fresh air to the workers and direct PERC vapors away from them. Ideally, vapors should be directed outside of the building.



Figure 1. Box fans set up to remove PERC vapors. Photo by Stephen G. Whittaker, King County

<sup>4</sup> [www.ini.wa.gov/Safety/Topics/AtoZ/PlumbingWork/rules.asp](http://www.ini.wa.gov/Safety/Topics/AtoZ/PlumbingWork/rules.asp)

<sup>5</sup> [www.safetyservicescompany.com/industry-category/construction/safety-when-working-with-natural-gas/](http://www.safetyservicescompany.com/industry-category/construction/safety-when-working-with-natural-gas/)

<sup>6</sup> [www.cleanersoutlet.com/products/nitrile-green-unlined-perc-glove/1609#ProductDescription](http://www.cleanersoutlet.com/products/nitrile-green-unlined-perc-glove/1609#ProductDescription)

<sup>7</sup> [apps.leg.wa.gov/WAC/default.aspx?cite=296-841-20025](http://apps.leg.wa.gov/WAC/default.aspx?cite=296-841-20025)

<sup>8</sup> [www.3m.com/3M/en\\_US/company-us/all-3m-products/~/3M-Particulate-Respirator-8247-R95-with-Nuisance-Level-Organic-Vapor-Relief-120-EA-Case/?N=5002385+3294780242&rt=rud](http://www.3m.com/3M/en_US/company-us/all-3m-products/~/3M-Particulate-Respirator-8247-R95-with-Nuisance-Level-Organic-Vapor-Relief-120-EA-Case/?N=5002385+3294780242&rt=rud)

## Clean out the PERC machine

1. Place absorbent pads on the floor around the machine before opening the tank to catch any spills.

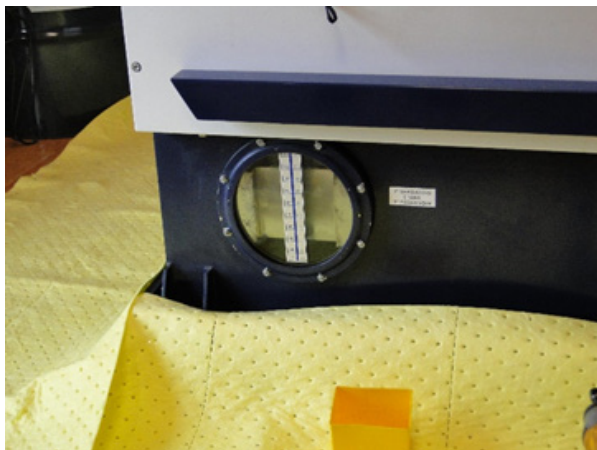


Figure 3. Place absorbent pads around PERC tanks prior to opening. Photo by Stephen G. Whittaker, King County

2. Working one tank at a time. Remove still bottoms and separator water. Place them in a waste drum.
3. Remove PERC from the machine by pumping it directly into a 55-gallon drum from the PERC tank.



Figure 2. Pumping PERC from tanks. Photo by Stephen G. Whittaker, King County

4. Remove the front cover to the PERC tanks.

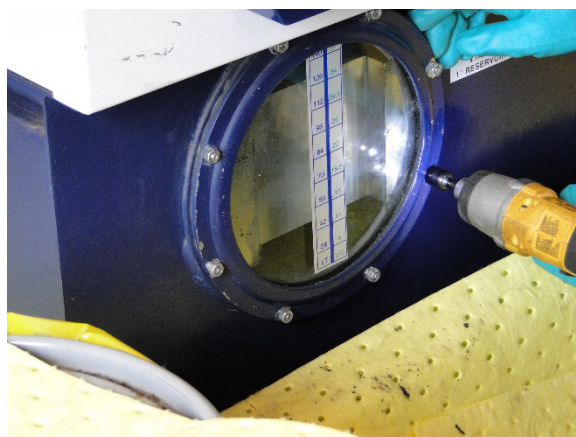


Figure 4. Remove front cover of empty PERC tanks. Photo by Stephen G. Whittaker, King County

5. Clean out the inside of the tank using:
  - a. Absorbent pads to mop up PERC inside.
  - b. A long-handled rod or similar item to reach the back of the tanks.
  - c. A mechanical pump if several gallons of PERC are left in the tanks.

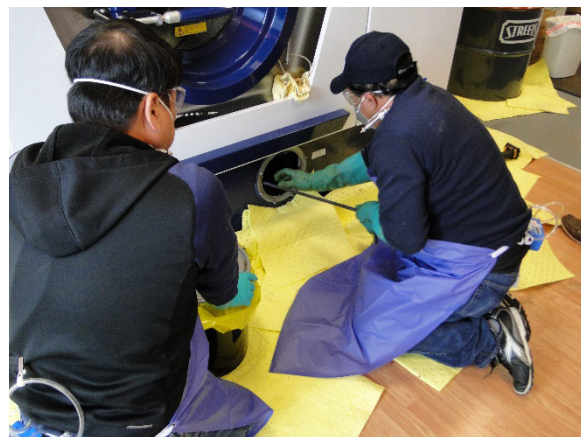


Figure 5. Clean out PERC tanks with rod and absorbent pad. Photo by Stephen G. Whittaker, King County

6. Wipe all surfaces in each tank. All metal surfaces must be clean to the sight.
7. Ensure all liquid PERC has been removed.
8. Replace the cover plate on the tank.

### Manage dangerous waste

All PERC-soaked rags and absorbent pads used to clean the machine, still bottoms, or “sludge” must be properly managed as dangerous waste.



*Figure 6. Place spent absorbent pads in a waste drum for proper disposal.  
Photo by Stephen G. Whittaker, King County*

### Remove equipment for disposal

1. Disconnect the gas, electricity, steam, and any other connections.
2. Remove it from your facility.
3. Transport it to an off-site recycling facility for disposal and scrapping.  
**Note: It is illegal to self-transport PERC or PERC waste on the highway.**