AIR MANAGEMENT PROGRAM FACT SHEET

Halogenated Solvent NESHAP

AM-443 2023

February 2023

The U.S. Environmental Protection Agency (EPA) issued a rule aimed at reducing the amount of hazardous air pollutants (HAP) emitted to the atmosphere when solvents evaporate from solvent cleaning machines (e.g., degreasers, parts cleaners). These are nationwide standards known as National Emissions Standards for Hazardous Air Pollutants (NESHAP) that were established to reduce the public's exposure to HAP emissions. This standard also encourages pollution prevention by listing equipment options and housekeeping practices as compliance options.

When is a Facility Affected by This Standard?

Facilities affected by this standard use cleaning or drying solvents containing one or more of the following halogenated compounds, in combined concentrations greater than 5% by weight, in a solvent cleaning machine. The term "halogenated" means the solvent contains a halogen (in this case, chlorine).

- methylene chloride (MC)
- trichloroethylene (TCE)
- perchloroethylene (perc, PCE)
- 1,1,1-trichloroethane (methyl chloroform, TCA)
- carbon tetrachloride
- chloroform

Buckets, pails, and beakers with capacities of two gallons or less are not considered solvent cleaning machines in this rule. To determine if a solvent contains any affected compounds, refer to the safety data sheet (SDS) or ask the material supplier.

How Does a Facility Comply with the Standard?

Amendments in 2007 added usage limitations for MC, TCE and PCE. The facility must show that emissions for each of these solvents are equal to or less than the applicable facility-wide 12-month rolling total emission limit shown here, determined using the calculations and procedures described in the rule.

Solvent	Limit for general use – in kg/12-mo average	Limit for military depot maintenance – kg/12-mo average
PCE only	4,800	8,000
TCE only	14,100	23,500
MC only	60,000	100,000
Multiple solvents – calculate MC-weighted emissions per rule	60,000	100,000

The federal standard offers several compliance options. The compliance standards are organized by the following types of solvent cleaning machines:

- Open Top (Batch) Cold Cleaning Machines
- Open Top Vapor Machines (separated by small and large machines)
- Conveyorized Cleaning Machines (separated by existing and new)

A facility may choose to comply by:

1. Switching to a non-chlorinated solvent, a water-based solvent, or a semi water-based solvent. (This option may exempt the facility from the federal standard.)
2. Meeting one of the machine standards (see Tables 1-3 in Appendix)
3. Maintaining the appropriate idling emission limit (see Table 4 in Appendix)
4. Meeting an alternative emission limit (see Table 5 in Appendix)

Facilities that have open top vapor and conveyorized solvent cleaning machines must perform periodic monitoring and recordkeeping to determine whether solvent cleaning machines comply with the federal standard. Table 9 in the Appendix lists the monitoring and recordkeeping requirements for each equipment standard/emission limit. There are no monitoring or recordkeeping requirements for open top cold cleaning machines.

The requirements are summarized in this fact sheet, but affected facilities should refer to the current eCFR version of the rule for all details.

Reports and Notifications

As of January 2023, the Halogenated NESHAP has not been amended to require facilities to file their compliance notifications or annual reports through EPA's Electronic Reporting Tool. Until that becomes a requirement, notifications should be submitted to DNR if these requirements are included in an air pollution operation permit or to EPA Region 5 Office in Chicago, IL for any area sources without a state issued permit.

Initial Notification Report

Each facility affected by this standard must file an Initial Notification Report. New sources must submit the report as soon as possible prior to starting construction, but no later than 120 days after becoming an affected source.

The report must contain the business name and the following information for each solvent cleaning machine that is affected by this standard:

- address where machine is located
- description of machine [including type (open top, conveyorized), solvent/air interface area or cleaning capacity, and any existing air pollution controls associated with the machine]
- installation date
- anticipated compliance approach
- estimate of the yearly consumption of affected halogenated compound(s) used

Initial Statement of Compliance

The deadline for existing sources has passed. New sources must submit their Statement of Compliance within 150 days after startup of the equipment.

A Statement of Compliance must include the business name, address where the machine is located, and a statement that operation of the machine complies with the standard, in addition to other details about the compliance approach for each machine. Refer to the rule for details that must be included in the Statement of Compliance.

Exceedance Report
Facilities with batch vapor and in-line solvent cleaning machines must submit an exceedance report semiannually, to indicate the status of their compliance with the requirements, efforts to repair machines and return to compliant operations, or whether the machine had no exceedances during the time period. If an exceedance occurs, the report must be filed quarterly until no exceedances have occurred for a full year. Refer to the rule for details on what to include in these reports.

Annual Report
An example annual report, as well as forms for Batch Vapor, In-line Machine and Batch Cold Cleaning Work Practice forms are available from EPA. A facility may submit the same information in their own format. The rule describes details required in the report for each of the machines.

For more information:

- Visit the EPA's Halogenated Solvent NESHAP Rule webpage
- Visit the DNR's SBEAP Solvent Cleaning webpage, or contact SBEAP staff at DNRsmallbusiness@wi.gov or 855-889-3021.

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Appendix – Compliance Requirements

<table>
<tr><th colspan="2">Table 1 - Open Top (Batch) Cold Cleaning Machines</th></tr>
<tr><th>Machine Standards (choose one option)</th><th>Work and Operational Practices</th></tr>
<tr><td>Option 1
Equip the machine with a tight-fitting cover.
Close the cover at all times, except when parts enter and are removed from machine.
Keep a water layer on the surface of the solvent within the cleaning machine. The layer must be at least 1.0 inch thick.</td><td>NA</td></tr>
<tr><td>Option 2
Equip the machine with a tight-fitting cover.
Close the cover at all times, except when parts enter and are removed from machine.
Machine must have a freeboard ratio of at least 0.75.</td><td rowspan="2">Also follow these practices:
Collect and store waste solvent in closed containers. Closed containers may have pressure relief devices, so long as those devices do not allow liquid solvent to drain from containers.
If a flexible hose or flushing device is used, flushing must be performed only within the freeboard area of the solvent cleaning machine.
Drain solvent-cleaned parts for at least 15 seconds or until dripping stops, whichever is longer. Parts that have cavities or blind holes must be tipped or rotated while draining.
Solvent level must not exceed the fill line.
Wipe up spills immediately. Wipe rags must be stored in covered containers.
Air-agitated and pump-agitated solvent baths must produce a rolling motion of solvent, but not "observable" splashing.
When the cover is open, the machines must not be exposed to air drafts greater than 132 feet/minute. Drafts must be measured 3.3 - 6.6 feet upwind from tank lip, and at the same elevation as the tank lip.
Do not use these machines to clean fabric, wood, sponges, or paper products.</td></tr>
<tr><td>Option 3 (remote-reservoir cold cleaning machines, only)
Equip the machine with a tight-fitting cover.
Close the cover at all times, except when parts are being cleaned.</td></tr>
</table>

Table 2 - Small Open Top Vapor Cleaning Machine (choose one option)	
Option 1 Meet an alternative emission limit in Table 6.	NA
Option 2 Maintain the idling emission limit of 0.045 pounds per hour per square foot of solvent/air interface area.	Also follow Table 7 - Design Requirements and Table 8 - Work and Operational Practices
Option 3 Use a freeboard refrigeration device and one of the following: • A system that superheats the solvent vapor • A working mode cover • A carbon adsorption unit • Dwell • Reduce the room draft • Freeboard ratio of 1.0	
Option 4 Maintain a freeboard ratio of 1.0 and use a superheated vapor system and use one of the following: • A working mode cover • Reduce the room draft • A carbon adsorption unit	
Option 5 Maintain a freeboard ratio of 1.0 and reduce the room draft and dwell	
Option 6 Implement any other method equivalent to Options 2-5 that is approved by the DNR.	

Table 3 - Large Open Top Vapor Cleaning Machine (choose one option)	
Option 1 Meet an alternative emission limit in Table 6.	NA
Option 2 Maintain the idling emission limit of 0.045 pounds per hour per square foot of solvent/air interface area.	Also follow Table 7 - Design Requirements and Table 8 - Work and Operational Practices
Option 3 Use a freeboard refrigeration device and a superheated vapor system and one of the following: • A working mode cover • A carbon adsorption unit • Reduce the room draft • Maintain a freeboard ratio of 1.0	
Option 4 Use a freeboard refrigeration device and reduce the room draft and use one of the following: • Dwell • Maintain a freeboard ratio of 1.0	
Option 5 Maintain a freeboard ratio of 1.0 and reduce the room draft and and superheat the vapor system.	
Option 6 Implement any other method equivalent to Options 2-5 that is approved by the DNR.	

Table 4 - Existing Conveyorized Cleaning Machine Standards (choose one option)	
Option 1 Meet an alternative emission limit in Table 6.	NA
Option 2 Maintain the idling emission limit of 0.021 pounds per hour per square foot of solvent/air interface area.	Also follow Table 7 - Design Requirements and Table 8 - Work and Operational Practices
Option 3 Dwell and use one of the following: • Freeboard refrigeration device • Carbon adsorption unit	
Option 4 Maintain a freeboard ratio of 1.0 and use one of the following: • A superheated vapor system • Freeboard refrigeration device	
Option 5 Implement any other method equivalent to Options 2-5 that is approved by the DNR.	

Table 5 - New Conveyorized Cleaning Machine Standards (choose one option)	
Option 1 Meet an alternative emission limit in Table 6.	NA
Option 2 Maintain the idling emission limit of 0.021 pounds per hour per square foot of solvent/air interface area.	Also follow Table 7 - Design Requirements and Table 8 - Work and Operational Practices
Option 3 Use a freeboard refrigeration device and one of the following: • A superheated vapor system • A carbon adsorption unit	
Option 4 Use a superheated vapor system and a carbon adsorption unit.	
Option 5 Implement any other method equivalent to Options 2-5 that is approved by the DNR.	

Table 6 - Idling And Alternative Emission Limits		
Equipment	**Idling Emission Limits[*1]**	**Alternative Emission Limits (EL)** **(3-month rolling average)**
Small open top vapor machines	0.045 pounds/sq ft/hour	• If the machine has a solvent/air interface, then **EL = 30.67 pounds/sq ft/month** • If the machine has no solvent/air interface, then: 1. If machine cleaning capacity is equal to or less than 2.95 cubic meters, refer to the federal standard [40 CFR 63.464(a)(2)(ii)]. 2. If machine cleaning capacity is greater than 2.95 cubic meters, then **EL = 330 x (Volume)$^{0.6}$ kilograms/month** Volume is equal to the cleaning capacity in cubic meters.
Large open top vapor machines	0.045 pounds/sq ft/hour	30.67 pounds/sq ft/month

Table 6 - Idling And Alternative Emission Limits		
Equipment	**Idling Emission Limits[*1]**	**Alternative Emission Limits (EL) (3-month rolling average)**
Existing conveyorized machines	0.021 pounds/sq ft/hour	31.28 pounds/sq ft/month
New conveyorized machines	0.021 pounds/sq ft/hour	20.24 pounds/sq ft/month
Batch open top cold cleaning machines	N/A	N/A

[*1] If using any of the control techniques listed in the Machine Standard options to meet the Idling Emission Limits, adhere to that control technique's monitoring requirements (see Table 9).

Table 7 - Design Requirements For Open Top Vapor And Conveyorized Cleaning Machines
Manual and bi-parting covers must be easy to use, large enough to cover the solvent tank, and be free of cracks, holes, and other defects. Or, when cover is open, the freeboard area must not be exposed to air drafts greater than 50 feet per minute.
Maintain a **freeboard ratio** of at least 0.75.
Equip machine with an **automated parts handling system** that moves parts or parts baskets no faster than 11 feet per minute (from initial loading of parts to removal of clean parts).
Equip **vapor cleaning machine** with a device that shuts off the sump heat if the sump liquid level drops to the sump heating coils.
Equip vapor cleaning machine with a primary condenser.
Equip vapor cleaning machine with a device that shuts off the sump heat if the vapor level rises above the top of the primary condenser.
Each machine that uses a lip exhaust shall be designed and operated so that all collected solvent vapors are routed through a carbon adsorption unit that is properly operated and maintained.

Table 8 - Work And Operational Practices For Open Top Vapor And Conveyorized Cleaning Machines
Close machine cover during idling and downtime modes, except when solvent has been removed from the machine, or maintenance or monitoring requires the cover to be open. Or, when cover is open, the freeboard area must not be exposed to air drafts greater than 50 feet per minute.
Parts or parts baskets being cleaned must not occupy more than 50% of the solvent/air interface area, unless parts or parts baskets are being introduced at a speed of 3 feet per minute or less.
Perform all spraying operations within the vapor zone or within a section of the machine that is not directly exposed to the surrounding air.
Do not remove parts or parts baskets from solvent cleaning machine until dripping has stopped.
Orient parts so that solvent drains from them freely. Tip or rotate parts that have cavities or blind holes before removing them from the machine.
When starting-up a vapor cleaning machine, turn on the primary condenser before turning on the sump heater.
When shutting-down a vapor cleaning machine, turn off the sump heater and allow the vapor layer to collapse before turning off the primary condenser.
When adding, draining, or transferring solvent, use leakproof pipes and couplings. Also, keep end of the pipe beneath the liquid solvent level.
Maintain and operate equipment as recommended by the manufacturer.
Make sure that equipment operators are trained to use the equipment properly. Operators may be asked to complete and pass a test of operating procedures during routine inspections by the DNR. Copies of this test are available from your local DNR district air staff.
Collect and store waste solvent in closed containers. Closed containers may have pressure relief devices so long as they do not allow liquid solvent to drain from container.
Do not use these machines to clean of fabric, wood, sponges, or paper products.

Table 9 - Monitoring And Recordkeeping Requirements		
Equipment Standard/ Emission Limit	**Requirement**	**Recordkeeping Frequency**
Carbon adsorber	• The halogenated solvent concentration in the carbon adsorber exhaust cannot exceed 100 ppm. If 100 ppm is exceeded, adjust the desorption schedule or replace the adsorption canister. • Locate lip exhaust so that cover closes below the lip exhaust level. • The adsorber must not be bypassed during desorption. • Measure and record the concentration of halogenated air pollutants in the exhaust of the carbon adsorber.	weekly
Cover	Visually inspect for cracks and to ensure proper operation.	monthly
Dwell	Determine proper dwell time for each part type/parts basket as follows: 1. Use parts or parts baskets that are at room temperature. 2. Clean parts in machine using standard operating procedures. 3. Determine the time it takes for part(s) or parts basket to cease dripping once placed in the freeboard region. 4. Proper dwell time is no less than 35% of the time determined in Step #3. Measure and record period of time that parts are held within the freeboard area of the machine after cleaning (dwell time).	monthly
Alternative emission limit	• Record solvent additions and deletions. • Return solvent level to solvent fill line. • Determine and record emission rate (3-month rolling average).	monthly monthly
Freeboard refrigeration device (also called a chiller)	• Chilled air blanket temperature, measured at the center of the air blanket must be 30% or less of the solvent's boiling point. • Measure and record that temperature while the machine is idling.	weekly
Automated parts handling system (Hoist Speed)	• Calculate hoist speed by measuring the time it takes for hoist to travel a measured distance. • Measure and record hoist speed, periodically.	monthly/quarterly*2
Reduced room draft	• Air movement or flow across the freeboard area (windspeed) or within an enclosure must not exceed 50 feet/minute. • <u>If machine is not enclosed</u> - Measure and record windspeed across top of freeboard area. Monitor room parameters that were used in initial compliance test to achieve the reduced room draft. • <u>If machine is enclosed</u> - Measure and record windspeed within enclosure. Visually inspect enclosure for cracks, holes, and other defects.	windspeed – quarterly Not enclosed: room parameters – weekly; wind speed – monthly Enclosure: monthly
Superheated vapor system	• Temperature at center of superheated vapor zone must be at least 10^{o} F above the solvent's boiling point. • Measure and record temperature at center of air blanket during idling mode. • Parts must remain in the superheated vapor zone for at least the proper dwell time.	weekly

*2 Quarterly monitoring is allowed if your hoist speed <u>cannot</u> exceed 11 ft/min or if your hoist speed does not exceed this for one year.